SCIENTIFIC PUBLICATIONS IN ACADEMIA: THE ROLE OF LIBRARIANS

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JULY, 2018
DECLARATION

I, hereby, declare that except for references to other works which have been duly acknowledged, this thesis is the result of my own research work and that it has neither in part nor wholly been presented elsewhere for another degree. I accept responsibility for any shortcomings that may be detected.

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DEDICATION

I dedicate this work to my daddy, Prof Kwasi Kwafo Adarkwa (Dept of Planning, KNUST). Daddy you have always been my coach and my friend. Thank you so much for spurring me on to learn. I am very grateful daddy.
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ABSTRACT

The study investigated the scientific publications in academia, and the role of librarians. Libraries are the major channel for storing; disseminating; and preserving scientific publications and contribute to the research performance of individuals and institutions. They are the most enduring feature of the academy and central to the values and practice of scholarship. The study aimed at exploring the services, research support facilities offered by librarians to faculty members at the College of Health Sciences and the College of Basic and Applied Sciences. It further sought to find out the availability of infrastructure facilities, scholarly communication tools used by librarians to communicate with faculty members and also the collaborative efforts between the librarians at the University of Ghana libraries and the faculty members at the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana. The theory of collaboration was used as the theoretical framework for the study. The mixed methods research design was used for this study. Data used for the analysis were drawn from 204 respondents from the College of Health Sciences and the College of Basic and Applied Sciences with the use of questionnaires and structured interviews. The keys findings were that, less than half of the respondents like the services provided by the librarians; emails usage by about two thirds of the respondents was the most commonly used communication tools by librarians for faculty members. However, librarians had a perception from the interviews conducted that, faculty members were indifferent when it came to the use of the library and its facilities. The study recommends that, strategic interventions are necessary to improve the sensitisation on the services and research support services provided by librarians to faculty. Services on advice on research topic; bibliometric analysis need more attention for the faculty members. Capacity building of librarians (both in human resource and e-resources) should be enhanced in order to have better interactions with
faculty members at the College of Health Sciences and College of Basic and Applied Sciences.
CHAPTER ONE

INTRODUCTION

1.1 Background to the study

“Research is an important activity in an academic work and forms one of the major functions of faculty members in the university. It is a means of communicating scientific works to the outside academic community to know and appreciate faculty’s contribution to knowledge. Strategic decisions made by academic institutions or universities about areas of research activity to be supported are informed by the research performance of faculty members. The research performance of academics helps the university authorities to understand the institution’s position relative to global and domestic standards of research production, for instance, how many of the faculty members’ articles are published in first-class journals? Is the number of publications increasing or decreasing? With solid objective information about research production, the university has a strong basis for charting progress, investing in facilities and working with other external agencies” (Reuters, 2008).

Higher academic institutions or universities and faculty members produce research outputs or publications which are used to rank the institution globally by international institutions and scholars. One of the ways of measuring a university’s attractiveness is by the university’s research output performance. “The most important asset of a university is its reputation and research is the playing field where reputations are made”. With the high reputation, the university’s ability to attract and retain high-performing staff, research grants and outstanding research students, both nationally and internationally, grows (Yan, 2009). The growing interest in research can be verified at universities strategic plans, international academics rankings and higher-education accreditation agencies (Marcial et al., 2016).
Scientific research depends on the communication of information that can be trusted, and the peer review process is a vital part of that system. Publications published in peer-reviewed journals or technical journals are considered high quality scientific production. Scientific research is concerned with the production of knowledge, in order to achieve a better understanding of the world. In universities or higher educational institutions, scientific research outputs published in peer-reviewed journals are considered as assets that enable authors or researchers to gain recognition and acknowledgement as experts in a particular field at national and international levels. They also give international recognition to an individual faculty member, department, university, and institutions. In some cases where a topic of major global importance is included in a publication, the author’s country, and even the region, may also get a greater recognition (Asnake, 2015).

Scientific research output, in the form of various types of publications, is regarded as the primary means of assessment and complements teaching and training in any academic field. There are many reasons for engaging in scientific research activities. Some of the reasons are the following:

a) fulfilling specific job requirements by employers that include promotion to academic position;

b) improving prospect of success in research grant application; and

c) making available research publication lists of faculty members (Peh, 2007).

These reasons make other researchers aware of what has been done in specific areas and help to avoid duplication of works. Among researchers, the adage “Publish or Perish”, that is publish your research or lose your career, is a threatening reminder of the importance of publication. Through research, the academic is able to obtain an inherent training undertaken to better appreciate and evaluate the published work of others (Peh, 2007).
Libraries are the major channel for storing, disseminating and preserving scientific publications and contribute to the research performance of individuals and institutions and they are the most enduring feature of the academy and central to the values and practice of scholarship. Researchers, faculty members and students in universities and higher educational institutions have access to the needed materials for the teaching, learning and research activities. “Libraries provide access to high-quality content which remains crucial to research, and spend huge amounts to sustain and develop their collections. Institutional repositories created by libraries increase the visibility of the institution and raise its research profile” (RLU K, 2011).

For any university library to be able to perform its functions very well depends on its ability to purchase needed researchable materials that would be able to meet the information needs of its users and the value of research generated by its faculty members. University libraries stocked with a large proportion of its materials of foreign materials do not reflect a healthy development of that library. The quality and quantity of locally generated research is very important to the balanced growth of the library (Fosu, 2000).

Serious transformation has affected scientific communication and its mode of transmitting scientific findings to the public and the world due to technological development. A large number of scientific publications are moving from the print format to the digital format; the sharing of scientific results by researchers online; and the rapid circulation of these results to other researchers online have all contributed to the technological development. Libraries help to develop and use the new technologies and new models of scholarly communications very well to gain much from them (Solimine, 2014). “Libraries are extremely important in helping academics to use very well the benefits and opportunities of the networked world such as open access and social media” (RLUK Report, 2011).
“The use of open access in scientific digital libraries and repositories (DLR) is fast-growing within research and academic communities. DLR provides open access platforms for efficient dissemination of research output by individuals or groups in research-oriented organisations such as universities, research and development companies, national research laboratories, centres, and institutes. The research output comprises scientific publications including journal articles, conference papers, technical reports, theses and dissertations, book chapters, and other materials about the theory, practice, and results of scientific inquiry” (Mahdi & Joorabchi, 2013).

Crow (2002), a member of the Scholarly Publishing and Academic Resources Coalition (SPARC) stressed that, “institutional repositories built by libraries are digital collections capturing and preserving the intellectual output of a single or multi-university community.

“Institutional repositories have the potential to serve as tangible indicators of a university's quality and to demonstrate the scientific, societal, and economic relevance of its research activities, thus increasing the institution's visibility, status, and public value. Furthermore, these institutional repositories represent the logical convergence of faculty-driven self-archiving initiatives, library dissatisfaction with the monopolistic effects of the traditional and still pervasive journal publishing system. They build on a growing grassroots faculty practice of posting research online, most often on personal web sites, departmental sites or in disciplinary repositories” (Crow, 2002). “Libraries have taken the responsibility for copyright clearance, metadata creation, and building institutional repositories for their institutions to enhance the visibility of the research activities” (Engeszer & Sarli, 2014).

However, with all these benefits scientific publication outputs bring to the universities and research institutions, access to information for research activities seem to be associated with many challenges. “Exorbitant prices of Science Technical and Medical (STM) journals and
library budgetary constraints often prevent institutions from purchasing the needed journals. The high prices of journals in getting access to research findings have attracted little attention from researchers. According to the Association of Research Libraries (ARL) statistics, since 1986, the average annual increase of the serial unit cost for an ARL library was 8.8%. This amounts to an increase of 226% from 1986 to date. The consumer price index for this period increased 57%. Libraries spent almost three times as much on serials in 2001 as they did in 1986 even though they acquired 7% fewer titles” (Lawal, 2002). “This phenomenon is more prominent or well known in the Science, Technical and Medical (STM) fields where journals are of primary importance” (Case, 2001).

“Journal price increases have far outpaced increases in library budgets and this has eroded libraries” buying power significantly. Consequently, academic libraries have been forced to cancel subscriptions or shift monies from other areas of their budgets in order to purchase a smaller number of high priced journal titles. In most academic libraries, costly Science, Technology, and Medicine (STM) journals are consuming an ever-increasing share of library budgets. This is having a negative impact on other acquisitions, such as research monographs, textbooks and journal titles in other fields. Meanwhile, it has been estimated that the world production of scholarly outputs has doubled since the mid-1980s, increasing the pressure on libraries to acquire more” (OASIS, 2014).

1.1.1 Study Setting
The study setting was the University of Ghana. “The University was founded in 1948 as the University College of the Gold Coast based on the recommendation of the Asquith Commission which was set up in 1943 to investigate higher education. It recommended among other things, the setting up of University Colleges in association with the University of London. It was established by government ordinance on August 11, 1948 for the purpose of providing and promoting university education, learning and research. The formal opening
ceremony of the University College of the Gold Coast took place in Achimota School on the 11th August, 1948. Its first Principal was the late Mr. David Mowbray Balme” (Agbodeka, 1998).

According to “University of Ghana Strategic Plan (2014-2024), the university has undergone significant changes since it invited a Visitation Panel in 2006 to review its processes, outputs and outcomes in the pursuit of its core mission. The mission of the University in the context of the last strategic plan (2001-2011) has been to produce world-class human resources. Since the University Council accepted most recommendations of the Visitation Panel’s report, many changes have taken place in the conduct of the University’s business and in its relationship with its different publics”. In the area of governance, there was enough evidence from the Visitation Panel report that decision-making at the University was constrained by too many layers and a committee system that had become dysfunctional. The University has now been decentralised into four colleges. These colleges are:

a) College of Basic and Applied Sciences

b) College of Education;

c) College of Health Sciences; and

d) College of Humanities.

For the purpose of this study, two of the Colleges, namely the College of Health Sciences and the College of Basic and Applied Sciences will be employed.

The research output of University of Ghana faculty members is growing steadily, but it remains far less than that of its „natural” peers in some African countries. The University is taking steps to address this through various initiatives that support the conduct of research and facilitate the publication of findings in high-impact journals and other relevant outlets”
(The new Strategic Plan of the University, 2014-2024). “The creation of the office of Research Innovation and Development has led to significant increases in funding for research from various sources, including internally generated funds. Over the last sixty-five years, the University of Ghana has evolved into one of Africa’s leading universities recognised worldwide for the academic and research excellence of its faculty, student body and the professional success of its alumni”. For instance, Times Higher Education (THE, 2016) World rankings placed the University of Ghana at the 5th position in Ghana and West Africa. Currently, the University is ranked first among sixty-six (66) Ghanaian universities in the country, seventh (7th) position in West Africa and thirty-fifth (35th) positions in Africa among two hundred (200) universities in Africa. The rankings took into consideration the teaching that is, the learning environment; research, the size or volume of the research outputs; the reputation and the visibility of the university research activities; the materials available in the Library; the citations of the university publications; research influence and the international outlook of the university (uniRank University Ranking, 2018).

The University library has been supporting research in this regard. “The University of Ghana Library System (UGLS) comprises the Balme Library and other libraries in the various Schools, Institutes, Departments, Halls of Residence and the Accra City campus of the university. The collection of University Library System consists of both electronic and print resources. The Balme Library is the main library of the University of Ghana and was established in 1948. Its facilities and scope of the coverage of the collection make it a very important and vital part of academic activity in the university”. The services, resources and facilities provided by the library include the following:

a) reference materials; text books; journal articles;

b) library user education;

c) photocopying;
d) binding of books (technical service);

e) consultation of Theses and past questions;

f) library instructions on the library catalogue and electronic databases;

g) off-campus access to databases;

h) online chat with a librarian;

i) access to online databases;

j) article request;

k) reference management software to manage research references activities in the university;

l) access to the University of Ghana’s institutional repository (UG Space) where you can find in digitised form theses; dissertations; peer-reviewed articles and other academic documents by researchers; faculty members of the university community; and

m) access to the University Catalogue (UG Cat), an online catalogue services which helps users of the library find out what the library holdings are and can be found in the library be it theses, articles and books.

Facilities available in the library include:

a) a 24 hour reading rooms;

b) research Commons (RC) a quiet well-furnished technology-equipped research environment for exclusive use by faculty members; graduate students and researchers of the university;

c) knowledge Commons (KC) thus a computer laboratory for the undergraduate students;

d) conference and Seminar rooms, thus an excellent multiple servable conference and seminar rooms available for faculty; staff and students academic use.
The primary clientele of the University of Ghana library are as follows:

a) faculty members of the university;
b) students of the university;
c) researchers of the university; and
d) administrators of the university.

The College of Health Sciences has six (6) libraries while twenty-three (23) departmental libraries operate under the College of Basic and Applied Sciences. These libraries collections are made up of both print and electronic resources which are specialised to them to help in the teaching, learning and research activities in the two colleges. The College of Basic and Applied Sciences has para professionals manning the libraries at the Colleges. The Colleges of Health Sciences and Basic and Applied Sciences depend on the main University Library electronic resources for their users or clients.

1.2 Statement of the Problem

In the view of Nwabueze et al. (2010), “research and the library are interrelated and are not mutually exclusive”. This opinion is posited by Sadiq (2005) who indicated that it was not possible to have a good research without a library. Academic libraries have traditionally supported the research process by making articles available via journal subscriptions; assisting with citation management; assessing research impact through bibliometrics and citation analysis; and assisting researchers with finding relevant published literature. They are providing access to a wide variety of information to support teaching, learning and research activities.

In spite of the role and services provided by academic libraries, it is uncertain whether librarians’ contribution at the University of Ghana towards research in the College of Health Sciences and the College of Basic and Applied Sciences is recognised. This is unlike the
contributions towards students’ academic performances where librarians are able to measure and account for the performance of students. In terms of research, the librarian’s role is more often than not, not documented and as such goes unrecognised. Additionally, it is unclear whether researchers at the Colleges of Health Sciences and the College of Basic and Applied Sciences even appreciate the critical role and challenges librarians experience when facilitating access to information. They may also not be aware of the new developments in scholarly communications which librarians at the University of Ghana strive to make accessible and may also not be privy to the challenges of the technological and digital revolution that librarians have to undergo to provide access to quick and timely information for research purposes.

In view of all these challenges, the researcher seeks to explore the value of librarians in relation to services and resources offered towards research within the selected colleges at the University of Ghana. Ignoring this critical role may result in less dialogue and non-collaboration between researchers at the College of Health Sciences and the College of Basic and Applied Sciences and librarians at the University of Ghana and may also result in library services and expertise not being developed and deployed in the most effective way.

1.3 Purpose of the Study

The purpose of the study is to explore the role of librarians in supporting research activities at the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana
1.4 Objectives of the Study

The objectives guiding the study were as follows:

a) to explore the services offered by librarians to support research activities within the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana;

b) to find out from the faculty members of the Colleges of Health Sciences and Basic and Applied Sciences, their perception and expectations of librarians’ support towards their research activities at the University of Ghana;

c) to find out the availability of infrastructure and resources at the libraries to support research activities in the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana;

d) to find out the current collaboration that exist between the librarians and the academics in the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana;

e) to find out the scholarly communication tools available in the libraries at the College of Health Sciences and the College of Basic and Applied Sciences used to communicate with faculty members in the University of Ghana; and

f) to make recommendations based on the findings on the value of librarians and their services to enhance research at the Colleges of Health Sciences and Basic and Applied Sciences at the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana.
1.5 Research Questions

The research questions that guided the study were as follows:

a) What are the services offered by librarians to the faculty members at the Colleges of Health Sciences and Basic and Applied Sciences in the University of Ghana?

b) What is the perception and expectations of faculty members at the Colleges of Health Sciences and Basic and Applied Sciences about librarians’ support for their research in the University of Ghana?

c) What are the available infrastructure and resources to support the research activities?

d) What is the current collaboration that exist between the librarians and the faculty of the Colleges of Health Sciences and Basic and Applied Sciences at the University of Ghana?

e) What are the communication tools available in the libraries used to communicate with faculty in the Colleges of Health Sciences and Basic and Applied Sciences at the University of Ghana?

1.6 Scope of the Study

The scope of the study focused on the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana. This is because; the two colleges produce scientific research papers in the University of Ghana.

1.7 Theoretical Framework

The study was guided by the Theory of Collaboration. The theory was developed by Loertsher (1982, 1988 and 2000). He defines collaboration “as the process in which two or more individuals work together to integrate information in order to enhance student learning”. In support of this, Whipple (1987) also defines collaboration “as a joint working, learning and sharing process that precisely focuses on the activities of teaching, learning and
researching among academic participants, in whom knowledge can be activated and transferred to create a knowledgeable community”. Whipple described “collaboration as an „educational process” which restricts the gaps of teaching, learning and research to create a more knowledgeable community”.

“The emphasis on this process is placed on the contribution of cross-disciplinary teamwork to develop new ways of teaching; to design learning experiences; and to enable co-planning; co-implementing; and co-evaluating of students” progress throughout the instructional process” (Butler et al. 2004: Corey, 2002; Montiel-Overall, 2005). Collaboration is “one of the factors that contribute to improved research skills” (Lance, Wellburn, & Hamilton-Pennell, 1993).

In library science, Montiel-Overall (2005) submitted that, various notions of working together have been confused with collaboration and proposes four collaboration models to distinguish collaboration from other joint efforts such as coordination and cooperation. The models were coordination; cooperation or partnership; integrated instruction; and integrated curriculum. These represent the increasing degrees of involvement and contribution of librarians and their partners from general activities for work efficiency purpose to more focused activities for student academic achievement.

Out of these four models, integrated curriculum reflected the highest outcome of collaboration in which teachers and librarians are working together to integrate library instruction into the subject content of the whole curriculum, in order to offer students fixed information skills. This aspect of collaboration reflects the major aims of librarians in the course of developing and fully including information literacy programmes with the course programme to enhance student learning”.

“The models evolved from the literature and from the taxonomy for librarians and teachers developed by Loertscher (2000). The models are descriptive of the range of joint efforts involved in working relationships that can lead to fully developed collaboration. Numerous
attributes such as collegiality; respect; and trust needed for collaboration to be effective are discussed. These attributes contribute to collaborative activities, such as shared thinking; shared planning; and shared creation of integrated instruction”.

Loertscher illustrated this in a figure below. He identified the levels in approximate relationship to the four models and illustrated the range of involvement between the teacher and librarians.

**Figure 1.1: The Four models proposed by Loertscher’s (2000) Taxonomy**

“Models A, B, C, and D involve a certain amount of networking as a precondition. Networking is a way for people to get to know each other and is important in building trust” (Austin 2000). “The models also involve some form of shared objective, which becomes part of the reason participants come together. For these efforts to be successful, however, high levels of trust are needed and participants must be seen as experts in their field. Research indicates that, as collaborators become more involved in their work together and their responsibilities increase, levels of trust and knowledge increase” (Black et al. 2002).
1.7.1 Model A: Coordination

“This model represents a common practice of bringing groups, organisations, and individuals together to alternate activities. In this model, people come together to help one another or to make their own work run more efficiently. Arranging schedules and making necessary adjustments in time, place, or work to avoid overlap in coordination” (Pollard 2005). Coordination and cooperation are used to identify collaborative efforts. In practice, librarians and faculty members can work together in the academic environment, make changes in their time to suit themselves and make schedules for their work. Whilst working together to improve the academic outcomes in the university, this model will help to avoid duplication of efforts on the part of the librarians and the teachers or other researchers. The trust that brings them to collaboration with one another, will lead to improved students learning; research efforts; and overall academic outcomes. This particular model A (Coordination) synchronises well with objective (d) of the study which seeks to find out the current collaboration that exist between the librarians and the academics in the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana.

1.7.2 Model B: Cooperation or Partnership

The second model involves two or more entities working together by agreement or similar goals and endeavours (Austin, 2000). Model B uses cooperation or partnership which involves setting of goals and reflects an idea of teamwork, assistance and networking. There is interdependency among members of the team (Polland, 2005). In this model being used for the study, the relationship between the librarians and the researchers or faculty members should be cordial such that an atmosphere of trust and collegiality would be communicated between them. The librarians would be able to teach their users information literacy to be able to access information needed for the teaching, learning and research purposes combine with shared objectives and instructional support from the teachers to create an atmosphere of
effective learning by the students and academics in the institutions. The model synchronises well with objective (b) of the study which seeks to find out from faculty members of the College of Health Sciences and the College of Basic and Applied Sciences their perception and expectations of librarians’ support towards their research activities at the University of Ghana.

1.7.3 Model C: Integrated Instruction

The model demonstrates the shared responsibility that exist between or among the individuals that come together to collaborate. There must be a good working environment which is flexible and trustworthy, based on the parties’ involvement in the shared vision; shared objectives; shared planning; shared thinking and shared creation of integrated instruction to improve the academic achievement of students and faculty members alike. For collaboration to be effective between the librarians and the teachers or faculty members, model C teaches that, there should be an atmosphere of shared responsibility between the two parties involved in working together through the instructions given among the teachers; the librarians and the students to enhance the knowledge to be contributed by them to the academic community. Objective (a) of the study which seeks to explore the services offered by librarians to support research activities within the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana synchronises with this model (C) that is Integrated Instruction in the theoretical framework.

1.7.4 Model D: Integrated Curriculum

Integrated curriculum results when the processes in model C are achieved. In this model, the Principal or the Vice-Chancellor of the institution, the two parties are from is very important. He or she creates or is responsible for establishing the norm for the institution in which people work together. The Vice-Chancellor or the Principal of the institution establishes expectation or sets the goal, manages resources, establishes norms and provides rewards to all
the teachers and librarians to improve on their productivity. Qualities such as friendliness; congeniality; respect; trust; flexibility; and communication are necessary for this model to bring results. Each of these models needs these qualities to be effective to improve academic standards and performance in the academic institution.

In conclusion, the researcher investigated how coordination; partnership between librarians and academics; shared responsibility between them as they work together and how the creation of an award scheme by the head of an institution was to bring about effective collaboration between academics and librarians, which in the end, would lead to improved students learning; research efforts and overall academic outcomes. Faculty members’ research activities were enhanced as this led to further increase in publication of research outcomes and generation of knowledge. Through workshops, seminars and other basic library practices, users of the library including faculty members; students and other staff of the academic institutions were imparted with information literacy skills to be able to function very well in their teaching; research and learning activities. The Model (D), that is Integrated Curriculum synchronises well with objective (c) of the study seeking to find out the availability of infrastructure facilities and resources at the libraries to support research activities in the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana.

1.8 Significance of the Study

The study was important in several respects. The findings of the study would help establish the value of librarians and libraries and their contributions to research activities at the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana. The level of collaboration between the College of Health Sciences; the College of Basic and Applied Sciences and the libraries in their pursuit to enhance the academic productivity in the university would be established and known. As a result of this, the
University authorities would know the benefits and help researchers receive from the libraries and librarians to increase their research outputs in the university which in the long run promote the University at the local, national and international level.

Through the study, the findings would help librarians in the university to build up a strong institutional repository and strong collaboration with the academics which will help in making the academics research profile more visible and recognised in academia. Additionally, the outcome of the study might help the authorities at the University of Ghana to give sufficient budget allocation to the libraries, instead of cutting down on the budget allocations given to them to run the libraries to support the teaching, learning and research activities in the university.

Stakeholders like the students, faculty members and other researchers would know and appreciate the role the libraries and the librarians play through the provision of research support services to increase the academic productivity of faculty members in the College of Health Sciences and the College of Basic and Applied Sciences. The findings of the study would help stakeholders advocate for more resources for the librarians and libraries to run their outfit very well to increase the research productivity in the university.

Furthermore, the findings of the study would provide a better picture and understanding to the librarians at the University of Ghana of the competitive environment they find themselves and also have a broad view of what is happening on the ground with respect to the faculties’ needs and their perceptions about the libraries and librarians as a whole. The findings would again inform educators or faculty members about the reality and standards of work in the profession and if possible get involve in a better collaborations between the librarians and faculty to receive the best from the libraries and Librarians in the university.
The findings of this study again would bring to the knowledge of sponsors why they should support universities with more research grants. These funds would be given to researchers and the libraries to be used effectively and efficiently to increase the research outputs for the benefit of the university. Last but not the least; the study would be used as a basis in which other research would be further conducted or done.

1.9 Definition of Terms

**Scientific publications:** They are where the results of knowledge derived by science are shared and taught to others in the world.

**Academia:** is defined as the environment or community concerned with the pursuit of research education and scholarship.

**Academic Libraries** encompass research libraries that work closely with other members of their institutional communities to participate in, support, and achieve the educational mission of their institutions by teaching the core competencies of information literacy the abilities involved in identifying an information need, accessing needed information, evaluating, managing, and applying information, and understanding the legal, social and ethical aspects of information use. In Ghana, they comprise the libraries of the country's tertiary institutions.

**Collaboration** within the context of this study is the act of working jointly with others or together in an intellectual endeavour.

**Infrastructure** within the context of this study refers to the shared technology resources that provide the platform for the organization’s specific information system applications, physical devices and software applications required to carry out tasks in the entire organization. This consist of computing platforms used to provide computing services (including computer
hardware, software, data management technology), as well as networking and telecommunications technology, and technology services.

*Perception* is the way in which something is regarded, understood or interpreted.

1.10 Organization of Chapters

The study has been organised into six chapters and they are as follows:

**Chapter one:** It serves as the introduction to the title of the study and it includes the background of the study; the University of Ghana history; statement of the problem; purpose and objectives of the study; research questions; theoretical framework; scope of the study; the significance of the study; and organisation of the study.

**Chapter two:** It deals with a thorough review of related literature of the study. The literature has been presented under the following themes: research; scientific communication; academic libraries; research support services offered by academic librarians to researchers; researchers’ perception and expectations of academic librarians; availability of infrastructure in libraries in supporting research; scholarly communication tools; and importance of libraries and information professionals or librarians to research community.

**Chapter three:** It describes the methodology used for the research. It included the research design; population; sample size; sampling techniques; instrumentation; mode of data collection; method of data analysis; and presentation of results.

**Chapter four:** It focuses on the presentation and analysis of findings of the study.

**Chapter five** dedicates to the discussions on the findings with reference to the objectives of the study.
Chapter six focuses on the summary of the findings; conclusion; and recommendations of the study.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

According to the University of Southern California (USC) Libraries Research Guides (2018), “the purpose of a literature review is to place each work in the context of its contribution to the understanding of the research problem being studied; describe the relationship of each work to the others under consideration; identify new ways to interpret, and shed light on any gaps in previous research; look out for areas of prior scholarship to prevent duplication of effort; and locate your own research within the context of existing literature”.

In this current study, the literature review carried out was to evaluate previous research undertaken in this field. This information would also be used in the analytical stages of the study to facilitate the achievement of the study’s objectives. The literature was reviewed under the following themes: research; scientific communication; importance of libraries; academic libraries; research support services offered by academic librarians to researchers; researchers’ perception and expectations of academic librarians; availability of infrastructure in libraries in supporting research; scholarly communication tools; and importance of libraries and information professionals or librarians to research community.

2.2 Research

Research is the most important means for communicating scientific works. It is a very important activity in an academic work in any university and forms one of the major functions of faculty members in the university. Research being a central function of the university means that, its performance must be evaluated. “Data from research performance helps to inform strategic decisions about what areas of research to support or build. It also helps the university leaders understand the institution’s position relative to global and
domestic standards of research production: how many of the faculty members’ articles are published in first-class journals? Is the number of publications increasing or decreasing? With solid objective information about research production, the university has a strong basis for charting progress, investing in facilities and working with other external agencies” (Reuters, 2008).

Scientific research done in Africa lags behind when it is compared with research done in other parts of the world (World Bank, 2005). In global comparative studies of research performance in Africa, they show very low results (King, 2004). This low rating is backed up by evidence research into selected case studies, and statistics, all of which are recognized to be of limited practical value, and true assessment within and across Africa in the fields of science. There is a problem of collecting reliable, up to date data on African science outputs at the international level. Many African countries have a big challenge of making sense out of scientific research, for policy purposes, especially for those nations in Africa that play a minor role in the world's science literature.

In practice, input statistics of science for instance, headcounts of researchers, share of the government funding spent on research and several key resources of science can be measured and statistically analysed in monetary terms. This could virtually appeal to analysts and decision makers in academic and research institutions to channel the right resources to boost up research. However, these things are very difficult to come by because, official national statistics on the distribution of resources and research personnel are often not available, and outdated statistical reports which fail to meet international quality standards are used (King, 2004).

In support of this, Tijssen (2007) submitted that, Africa has lost 11% of its share in global science since its peak in 1987. The reasons accounting for this decline is that, there is the lack
of resources in many African countries; unwillingness to invest in infrastructural facilities for research; and modern equipment in order to maintain workers at universities, research laboratories and health institutions by African authorities. Many researchers suffer from poor working environments, low salaries, lack of equipment to work with and improved career prospects, which are damaging morale among researchers in Africa. These problems encourage researchers in Africa to migrate to other industrialised nations to work and develop those nations.

However, the lessening shares of African science according to Tijissen, do not reflect a decrease in number as such, but rather an increase lesser than the worldwide growth rate of science. For instance, in the year 2001-2004, output in science publications in Africa rose by 38% up to some 46,000 articles. Countries accounting for this modest growth of the scientific outputs were the Northern Africa countries like Egypt and Maghreb countries (Algeria, Mauritania, Libya, Morroco and Tunisia) during the years 1998 - 2002. In the years 2001 - 2004, Tunisia and Algeria have been able to generate noticeable growth. Another reason for the low level of sub-Saharan publication output is the removal of the African Journals from the citation Indexes. For instance, the number of South African Journals dropped from 35 to 19 during the years 1993 - 2004.

Again, the research specialisation of African countries and the international research performance of African countries are partially dependent on their research specialty profile. Some fields of science, for instance, the medical sciences; is globally oriented and tend to attract more internationals. Kenya is the only one or the more highly developed African country with a strong concentration of international research within medical and life sciences (Tijissen, 2007).
Similarly, a study conducted at University of Ghana Library (UGL) and University of Zambia Library by Alemna, Chifwepa and Rosenberg (2000) on the use of African published journals (APJ) revealed that, “even though African published journals are important for both teaching and research, they are not popular among academics. The study confirmed the importance of non-African journals to teaching and research as undisputable. Eighty-nine percent (89%) of academic staff at University of Ghana and seventy-three percent (73%) of those at University of Zambia placed importance on journals not published in African published journals.

Nighty-five (95%) of staff at the University of Ghana and seventy-eight percent (78%) of the academics at University of Zambia use updated journal articles for updating their lecture notes. Eighty percent (80%) of academic staff of the University of Ghana Library recommended journals for students reading, against forty-three percent (43%) of staff of the University of Zambia Library. Okonofua (2008) posits that, university research is the opportunity to generate ideas and innovation and to essentially alter economic prosperity of nations and the quality of life of the citizens”. Bentil (2017), in an article in the Daily Graphic reported that, the president of the Republic of Ghana, Nana Addo Dankwa Akufo Addo has given out four hundred and thirty million dollars ($430 million) representing one per cent (1%) of the country’s gross domestic product (GDP) to research and development in the short and medium term in the educational sector. This shows the importance placed on research by the government.

The GDP measures the national income and output in a given country’s economy. Ghana’s GDP in the year 2016 was $42.69 billion representing 0.07% of the world’s economy. Research and Development fund would be made available for all research activities in both the public and private educational and research institutions, the president said at the 20th Convocation and graduation ceremony of All Nations University (ANU) in Koforidua in the Eastern region. It will take some time to realise this vision, but it will eventually make Ghana
reap the expected benefits of the polices that have been put in place to transform research and 
education.

2.3 Scientific Communication

communication is the system through which research and other scholarly writing are created, 
evaluated for quality, disseminated to the scholarly community and preserved for future use”. 
Ilingworth & Allen (2016) quoting Niehls Bohr in his article on effective science 
communication said, “as scientists, our task is to communicate experience and ideas to 
others”. “Communication is central to the practice of science and sharing knowledge is the 
social glue that holds academic communities together, and publication” is the “currency of 
jurisdiction” (Mahmood, Rowley & Hartley, 2009). The importance of science is done 
through communication and the outputs from scientific work are necessary to be added to the 
knowledge body of a scientific community. Scientific progress depends on the 
communication of information that can be trusted, and the peer review process is a vital part 
of that system (Garvey, 2014).

According to Spier (2002) “formal reporting of scientific research and the peer review 
process was brought about by Henry Oldenburg, the Secretary of the Royal Society of 
London and publisher of the Philosophical Transactions, the earliest known scientific journal 
in continuous publication in the year 1665. Scientists or researchers at that time, thus during 
the renaissance period, were reluctant to share their scientific discoveries out of fear that 
other research scientists would claim their works. To address this, Oldenburg employed a 
series of practices that established the process of modern day peer-review process. He 
appointed members of the Royal Society as independent experts to review manuscripts by 
researchers before approving for publication”. Oldenburg registered authors and manuscripts
of researchers identifying when new scientific findings occurred, usually giving date and time of day they were registered.

Spier further stated that, Oldenburg’s methods obligated researchers to mention or cite others research scientists of their findings in order to recognise them in “subsequent manuscripts and this ensured a regular schedule for publication of the accepted manuscripts in Philosophical Transactions. The Royal Society of London’s practices were the predecessors to modern day principles of scientific communication and peer review process, in which scholarly journals operate in their role to communicate scientific research findings” (Spier, 2002). Oldenburg therefore brought about confidence into the work of research scientists and their publications and added new and more knowledge to the scientific communities.

Scientific communication according to Bjork (2007) is divided into formal and informal part. Formal scientific communication is by publishing research works in a refereed journal which is the primary channel of communication meant for a wider audience, for instance among professional colleagues. The progress of science and scientific communication depends on how scientists are able to communicate their results of the findings to their peers and willing to implement these results in the new technology and practice in the digital era. Informal form of communicating science on the other hand, involves oral presentation of all kinds, for instance, person to person meeting, conference presentation as well as email messages of the research (Bjork 2007).

Scientific communication makes the author or the research scientist gains possession of ideas; societal acknowledgment for the author and the institution he or she belongs to; claiming priority over discovery in research; establishing status among professional colleagues; and also spread the diffusion of their findings and ideas to add to the knowledge in science and also advance in their career (Rao, 2009).
Grimes, Bauch and Loannidis (2018) submission in an article written by them on “Modelling Science trustworthiness under publish or perish pressure” stated that scientific publication is derived from the research conducted by scientists or researchers when they are published in peer reviewed journals and made known to the world. They are greatly important to the scientific activities. Grimes, Bauch and Loannidis continued to say that, “academic publications are thought to be a substitution for scientific productivity and ability and they are also where results and knowledge derived by science are shared and taught to others in the world. Results are of no use to anybody if they are not made available to other experts, to be discussed, critically evaluated and built on”.

2.4 Scientific Publications and Digital Era

Scientific research publications include scientific articles published in scientific journals; books written by scientific authors; patents; presentations of academic conferences; government reports; scientific publications via the internet; and technical reports. Institution of higher education or universities and their faculty members are ranked based on their research outputs or publications. One of the ways of measuring a university’s attractiveness used by international institutions and scholars is their research output performance. The most important asset of an institution of higher education is its reputation and is achieved through research activities and performance. “With the high reputations, the university’s ability to attract and retain high-performing staff, research grants and outstanding research students, both nationally and internationally, grows” (Yan, 2009).

Hoppenfeld and Smith (2014) added that, over 80% of journal articles are used for research purposes and the more researchers are esteemed and celebrated; the more they invest in time to read scientific works. Libraries have conventionally supported and provided researchable materials to researchers. Serious transformation has affected scientific communication and its mode of transmitting scientific findings to the public and the world due to technological
development. A large number of scientific publications are moving from the print format to the digital format; the sharing of scientific results by researchers online; and the rapid circulation of these results to other researchers online have all contributed to the technological development. Libraries provide services and access to a huge range of electronic resources to support in the learning, teaching and research activities; signs the agreement with the e-resource providers and then make them available to the library (Solimine, 2014).

This opinion is shared by Kataria (2016) who agreed to the fact that, scientific publications have undergone severe transformation over the years and now, there is a trend of digitalisation of all forms of communication”. “Researchers or authors were submitting their manuscripts for publishing in hard copies some few years ago, but now, most of the scientific journals are using online platforms for the entire publishing process, for instance, manuscript submission; review; revision; proofs, and publishing. The traditional print journals are now using online platforms as there is an increase in usage of digital devices such as computers; laptops; tablets; and smartphones by scientists; researchers and clinicians to search online and read articles in digital form. Technology has been part of the educational landscape for an inordinate length of time” (Kataria, 2016).

“The beginning of the internet has changed the processes of both formal and informal scientific and scholarly communication. It has simplified communication and has reduced geographical distances” (Costa and Meadows, 2002). “The advances in digital technology have given to many ways of announcing or telling research findings and to document the diffusion of innovations and inventions” (Sarli, Cathy, Carpenter, & Christopher, 2014).

An ever increasing part of today's scientific knowledge is expressed, published, and archived exclusively in the form of software and electronic datasets (Hinson, 2016).
The key stakeholders of disseminating scientific publications are the libraries, information intermediaries, as well as web search engines. They enable users and readers to find out about the research and retrieve publications. The library and librarians’ use their expertise, skills and knowledge to help users of the library in getting access to the scientific publications (Solimine, 2014).

2.5 Importance of Libraries

The biggest challenge the library profession is facing in recent times, is staying relevant to its users. Libraries and librarians provide training; managing citations and reference management systems, such as Endnote, Mendeley; and research discussion services to their users to improve the efficiency with which they search for literature databases (Shaffer 2013). A study conducted by Rasul & Singh (2017) examined “postgraduate students’’ views on the role of the academic library services in facilitating their research and their satisfaction with the sources and services provided. Data collected from 375 randomly selected postgraduate students in four Malaysian public universities revealed that, the majority (90.1%) of respondents acknowledged the important role of library in facilitating research, and 72.5% of the respondents were satisfied with the current role being played by the libraries. However, certain areas needed to be improved such as longer opening hours for physical visits, in spite of the facilities for remote access assistance for supporting students’’ research”.

Webb (2007) emphasised that, “academic libraries are gateways to academic knowledge through their own collections and by facilitating access to researchable materials. In line with its core function, academic libraries providing effective library services could support the research activities of researchers or academics. University libraries are devoted to what they see as the needs of students and researchers at the university; otherwise, they would not effectively assist the research activities, nor could contribute to the university’s research”.

The overall support of academic libraries to research should be strategic (Haglund, 2008).
Research university libraries have the responsibility of providing databases and electronic resources, in addition to the books; journals and other researchable materials available in the libraries. In developing countries, for instance, very few libraries have the resources to provide the necessary research information resources to keep up with current information flow. Although the academic libraries budgets are apparently inadequate, they do their best to support access to global knowledge (Altbach, 2013). “Research universities have a special responsibility to ensure that, relevant information is made available to the broader academic community. The role of libraries and librarians are often looked down in the internet age, however, their role in this era remain very important, because the libraries have not only become repositories of books and journals but also have become the place where research information resource materials are provided for the university and academic community” (Altbach, 2013).

“In the digital era where scientific communication has undergone profound transformation such as the migration of an increasing number of publications from print to digital formats; the practice of sharing of research results online; and the need for rapid in-depth circulation of these results; the libraries continue to play a central role in these developments. They guide access to researchable materials; validate content of materials; direct and orient the users of the library and select appropriate documents for the researchers and other users of the library” (Solimine, 2014).

**2.6 Academic Libraries**

According to Dold (2012), “librarians address all the levels of information needs of the university. Librarians create a framework for the acquisition of knowledge in the developing of university education”. “The library”s acquisition of materials; material production; its storage and instructions for its safe and gainful use enable the librarians meet the information needs of its users. Accessibility of information resources and services provided by libraries
and librarians are an important part in the research process. Faculty members in universities are also required to do research themselves, take on more postgraduate students, and are assessed based on the outputs of their research. This has led to researchers making greater demands for access to information and on the quality of information provided by the librarians” (Singh 2007).

Ashikuzzaman (2013) defines “academic libraries as a group of libraries established, maintained, and administered by a university to meet the needs of its students and members of the academic staff. A university library is a part of a university set up. It is established to serve the objectives of its parent institution. Every library programme must support universities total programme”. Emwanta and Nwalo (2013) agreed to it by submitting that, “the library forms a vital part of a university established to meet the information and research needs of its students, faculty, and staff. The university library is seen as a repository of knowledge and information gateway where information materials are stored”.

Similarly, Ifijeh (2011) added that, “university libraries” aim is to advance the teaching, learning, and research activities in the university and their functions are to provide researchable materials for undergraduates; postgraduates; supplementary reading; provision of materials to support academics research activities; and external and collaborated researches. Academic or university libraries store or keep various forms of materials or resources to support their users” informational needs”.

Aina (2004) in the same vein agreed that, “information resources come in a variety of formats, both in print and in electronic formats, which are very useful to the users of the library. The final use of the library resources is to promote teaching, learning and research in the university and the library in all respect is a service. Its primary mission is to support the learning, research and teaching activities of its parent institution by providing access to information resources”. The creation of subject librarian system in the various academic
libraries is one effective way in which the objectives of the libraries could be attained. This could be done by guaranteeing that the libraries remain user-centered. Subject librarians provide the boundary between the user of the library and the library itself. They help to ensure that the services provided by the libraries are concentrating on the existing user needs and also address the changing user needs at all times. The subject librarian system plays an important role in the electronic library environment (Pinfield, 2001).

In a research study conducted by Smith (2006) on academic libraries, he submitted that, the library performs three broad functions in order to meet the needs of its users. These functions are as follows:

   a) acquiring and storing of books and other informational materials;
   b) provision of quiet space in which users can study, read and have discussions among themselves; and
   c) to provide the opportunity in which academics or faculty members to consult librarians for their information needs. All these functions of the libraries support the informational and research needs of users and in the long run bring to fruition the objectives of the university as a whole.

2.6.1 Academic library services

The largest services offered to academics to help in their research are finding sources and helping with citation. Librarians with their research support roles are collaborating with other academics in academia in the production of scholarly communication; research publications; the research resources in academic libraries and show how versatile the librarianship profession is (Isaac-Menard, 2012). “The digital era gives the ability to access information by using simple, fast and electronic means. It has also changed the scholarly communication, transformed or changed scientific communities to "Scientific networks" (Cox and Vesbaran, 2016).
Academics claim that, through “the internet they gain access to wider and current sources of information for their research needs; allowing them to read more different materials; actively participating in discussion groups and research enterprises; and improve their communications and information flow between them and other faculty members” (Steele, 2014). However, “faculty members from the humanities still esteem highly the printed materials in the library. They claim, it affects their feelings, perceptions, and the way by which they experience their research. For instance, in an interview with faculty members from the humanities revealed that, it is necessary for the researcher to experience the surroundings in which he or she works and in addition, experience the academic library as a working environment and as a place in which to use materials” (Bulger et al., 2011; Saunders, 2015).

According to Hoffman (2016) “libraries have long stood on the shifting sands of change”. The key to survival has been to understand that, change should be met at the point of need. She emphasises that, the traditional role focused on discovery and instructional services have moved to the real of a broader area of exploration, learning and working in teams. The evolving world of interdisciplinary collaboration across departments and disciplines in academic places, librarians are to use their essential expertise in collection development; metadata; referencing and instructional services to meet the needs of the subject based faculty colleagues. Hoffman emphasised on the fact that no matter the size of any academic library or budget allocated to it, librarians and their libraries should contribute to meet the information needs and support the research activities of faculty members in academia.

Auckland's (2012) confirming to the fact that librarians should have knowledge in the discipline they support argued that, the research support skills provided by librarians in the various libraries, for them to be able to fully deliver this new role, librarians need to have the skills and knowledge required to perform expertly with confidence. Hoppenfield and Smith
(2014) confirmed that, “a lot of faculty members read articles in the electronic format away from the library but obtain more than half of the materials in the electronic format articles from the academic libraries (either from the libraries own collection and subscription or through interlibrary loans). Rupp-Serrano and Robbins (2013) also added that, faculty members get relevant information through diverse means; mostly by searching databases and by internet or through peer recommendation”.

Shun-Han (2017) claimed that libraries should be better resourced in terms of budgetary allocation by their academic institutions or universities so as to support research properly. The increasing number of inter disciplinary studies has brought about the lack of sufficient budget in supporting research. The increasing interdisciplinary studies have brought about more collaboration between members of different faculties which is more diverse and costly.

Budd (2009) addressing the changed in the academic library situation added that "All of the access services and other activities that Librarians and libraries offer depend on skilled and knowledgeable staff". Budd (2009) citing Campbell (2006) states that the library is loosing its position as the top source of inquiry due to the impact of digital technology. But if the library is able to conform or change their roles with the help of information technology to give access to all the kinds of information through information literacy programmes in their institutions, more users would be attracted to the library to use the facilities . Budd in his research on examining the trends of academics from libraries in the face of technology, libraries were asked to incorporate information literacy into the institutions mission. A total of 40% of the research universities replied in the positive; 39.2% of Master's granting institution said yes and 31.5% of Bachelor's granting Colleges said yes. Information literacy in academic institutions help students and faculty members, locate need information, and evaluate sources of information effectively. Technology effect help learning to be done or is possible in or without buildings.
Barner (2011) finding out special ways academic library could grow in the digital era, submitted that, “libraries and librarians should be proactive in delivering their services and offering of information to the users through the use of technology. Information sources; information distribution; and information service to the library users are no longer in the hands of the academic library”. “Users fall on the internet to get their information to satisfy their needs, but there must be a realisation and understanding that, there is a need for information professionals or librarians in academic institutions to mediate and impart information literacy to their users to make it easier for them to easily access whatever information they may need for their learning, research and teaching activities in the universities. Metadata personnel in the libraries also can contribute to the process of cooperation between faculty and the librarians by using their expertise of metadata (information) in the library “(Lewis, 2007).

2.6.2 Academic Libraries in the digital Era

Modern society is based on information resources. The traditional concept of libraries, which was completely based on print media, is changing to digital form, with the help of information technology. A digital library is highly organised collection of electronic learning resources. The changing environment has changed the role of librarian from being a custodian of book to a provider of information. It is therefore pertinent on the part of the librarian to acquire new skills required for developing and managing the modern library. The enablement of library and information profession with IT driven skills is aimed at providing services as the users expectations. The digital era has given the academic libraries the opportunity and the duty to examine themselves and define new roles in order to be able to meet the informational needs of users in this changing environment. Altbach, (2013) submitted that, the internet is major element in the communications revolution and will continue to influence higher education or research universities. In developing countries,
research universities obtaining faster internet connections, make it easier to communicate and access data.

However, Altbach admitted that, until recently, the internet access had not been entirely reliable in the universities in many developing countries. The universities do not only have the equipment and fast connectivity but also have the personnel, skilled in information technology and this make the academic community active in research and communications. The issue of communications and networking are the core and unique issues of research universities which no other institutions can carry out. “Librarians’ expertise within the field of information includes retrieval skills; interpreting metadata; information and knowledge management; using criteria in order to judge reliability and accuracy of information is an important professional tools. It is rare qualities and valuable ones at the current information environment “(Bates, 2015).

The traditional roles or functions submitted by Smith (2006) in which the library acquires books and other informational materials; provision of quiet space and discussion areas for researchers and students; and opportunities provided for faculty to consult librarians for their research needs have been changed by technology. Raju (2016) said these changes have come about because of the rapid evolution of information and communication technologies (ICT) and has embraced the digital library model. “Librarians are principally subject to the difficulties presented by the rapid change in technology, because our traditional roles are keeping and providing access to information the university campus and community. Academic libraries must be more than just a curatorial service for our universities and colleges” (Jennings, 2013). “Academic libraries have moved from focusing on the management of physical resources and related services to transforming resources and services into digital format to support teaching; learning and research “(Choi & Rasmussen, 2009).
The knowledge and skills of librarians have been affected. The change environment now requires new generation of librarians who have the required skills to mediate it, Orme (2008) grouped the required skills and knowledge needed in this digital era into:

a) “discipline-specific knowledge, this is knowledge that relates specifically to the library profession;

b) generic skills, thus general skills which apply to all discipline; and

c) personal competencies, that is attitudes, values and personal traits”.

Choi and Rasmussen (2009) conducted a content analysis and found that, “the key disciplinary knowledge needed in the digital era is by;

a) understanding metadata; content creation and management;

b) Generic skills involve effective communication; inter personal skills; critical thinking and teamwork”.

A study conducted by Howard (2009) in Australia submitted that, personal competencies that should be possessed by librarians are flexibility, adaptability and reflective thinking. Librarians in this new era must be able to switch quickly, adapt to the changes that have come up and learn to acquire the skills needed to help and provide the research information resources and materials for the library users. According to Jennings (2013), “change is difficult and librarians are the ones particularly subjected to the difficulties presented by the rapid change in technology. This is because; the traditional roles of keeping and providing access to information for our campus and community are changing. Academic libraries must be more than just a curatorial service for our universities and colleges; otherwise, the budget for the libraries would continue to stay flat or be cut down by a greater percentage.

Furthermore, as libraries move away from the physical curation of materials to the managing of electronic content, researchers, faculty members and other users of the libraries have to see the value of the physical space that would be available in the libraries. The space could be
used for more workshops and seminars organised by the libraries and also for discussion areas for students and faculty members. Librarians and academic libraries have to prove to stakeholders that, they are still relevant in the digital age so that no part of the library buildings that have been created or made available because of the digital activities in the library, would not be occupied by external departments in the university or academic institution” (Jennings, 2013).

Barner (2011) attested that, “the academic library as a growing organisation in the digital era, their original position as a central mediator is no longer guaranteed. Users of the library prefer to seek for information on their own rather than seeking for information through the library. They access information from the internet using Google, Yahoo, etc. In support of this, Martell (2008) added that, “libraries are no longer in the traditional mediation again because of the internet. The internet; electronic resources; and academic library portal make it possible for users to access information for the course work and research activities without visiting the library”.

A study by Martell (2008) provided data on the library use from 1990 - 2006. Data from different libraries were provided. For instance, “at the University of Maryland, circulation in the library decreased 24% between 1999 and 2005. University of California system, circulation decreased from 8,377,000 in 1991 to 3,326,000 in 2005 or decreased by 60%. According to the Dean's office authorities, decrease in circulation and use of materials in-house amounted to the increase in electronic full text availability online”.

2.7 The role of librarians in academic research and teaching

“Universities play a key role in the research and development process in academia. Research is taking on increasing importance in universities and colleges. Universities are making larger allocations for research and the rank of university is based on their research outputs” (Singh, 2007). “The accessibility of information resources and services provided by libraries is an
important element in the research process. Postgraduate students are key producers of research in universities, and access to information in their research activity is key “(Rasul & Singh, 2017).

Amara, Landry & Halilem (2015) attested that, “universities have demanded that faculty members conduct research which enriches the lecturers, develops their teaching capabilities, contributes to the continuous development of the information world, and subsequently, contributes to their promotion in the academic institutions”. King, Tenopir, & Choemprayong (2009) added that, “the articles from research journals provided by the libraries in academic institutions are the most important, relevant, and necessary source of scientific information for university faculty members, who use them greatly, mainly for research and teaching purposes. They further stated that, more than 80% of journal articles gotten from the libraries are read for these purposes”.

Singh (2007) also acknowledged that, “faculty members are required to do research themselves, take on postgraduate students, and are assessed based on the outputs of their research”. This has led to faculty members or researchers making countless demands for access to information at the libraries. And in effect, “librarians address all levels of information needs for the university: its acquisition, its production, its storage, and instruction for its safe and gainful use” (Dold, 2012).

A research conducted by Rasul & Singh (2017) examined “postgraduate students” views on the role of the academic library services in facilitating their research and their satisfaction with the resources and services provided by librarians. Data was collected from 375 randomly selected postgraduate students in four Malaysian public universities. The findings revealed that, the majority (90.1%) of respondents acknowledged the important role of the library in facilitating research, and 72.5% of the respondents were satisfied with the current role being played by the libraries. However, certain areas needed to be improved such as longer opening
hours for physical visits, in spite of the facilities for remote access assistance for supporting students’ research. Universities develop applicable policies, make funds and facilities available for research, and encourage their staff and students to do research” (Rasul & Singh, 2017).

Furthermore, Wilson and Tenopir (2008) examined “quoted references from faculty publications at the University of New South Wales, downloaded from Web of Science, and journal impact factors from Journal Citation Reports. It was revealed that, libraries play an important role in the research process of the academic members in all faculties in the university. Access; searching for research information materials; and citations for research purposes rely mainly on journals made available through the library’s electronic collections (e-collection). It is very important that, when it comes to scholarship, there is continuous access to scholarly articles provided by the libraries through journal subscriptions and institutional repositories in the university”.

2.8 Research support services offered by academic librarians to researchers

Research support is defined as “a set of services and facilities which assist in increasing research productivity and scholarship” (Parker, 2012). Research support services have come about in “direct response to the drivers that shape institutional strategies and direction. Major global drivers include: the increased importance of university ranking; research and impact evaluation; and open access “(Brown et al, 2018).

Developments shaping emerging research support services in academic libraries are:

a) Open scholarly communications increasing;

b) Digitization of resources;

c) Development of institutional repositories;
d) Data generated and required;

e) Research evaluation exercise; and

f) Requirement of funding agencies for the ongoing curation of research data

However, “the challenges encountered by academic librarians seeking to engage in data management and curation issues to support research are found at the individual level thus, acquiring skills and confidence and at the organisational level, thus, creating the supportive environment” (Auckland, 2012; Jaguszewski & Williams, 2013).

Corral (2012), in response to these drivers, University of Queensland (UQ) “proactively established teams focused on emerging services for the university community. Development of sophisticated institutional repository (UQe-Space). The repository provided open access to the university’s research outputs; digitized special collections and research database.

Between 2011 and 2017, UQ experienced a number of organizational readjustments to ensure that the library met the demand for research support services by providing dedicated research support staff which grew from 6 in 2011 to 30 up to date. Increased focused on research outcomes, research evaluation and changes in government policy, academic libraries have reviewed their traditional roles on collection, reference and information literacy and also increasingly providing services that support academia in their research practice.

Research support services have always been provided by academic libraries. The services supporting research include the following:

a) Collection services, that is providing access to research materials such as books, journals and databases;
b) Reference services (providing information sources and searches and research consultation);

c) Information literacy services (classes on searching of specific databases or the use of bibliographic software);

d) Managing institutional research outputs through the institutional repositories (Corral, 2012).

Stellenbosch University library in South Africa for instance provides these research support services to its users and they include the following: access to information sources; bibliometrics analysis; borrowing of print materials; ethical use of information; expert advice and guidance on research activities; subject guides; faculty librarians compile guides of recommended, authoritative resources (books, reference materials, journals, databases, websites, etc); and networking and collaboration.

A study conducted by Kennan & Afzal (2014) on “research support services provided by academic libraries in the UK, Australia, New Zealand and Ireland, 219 questionnaires were distributed and 140 valid responses were obtained. It was revealed that, most of the academic libraries are providing research support services the areas of bibliometrics and data management. Academic libraries perceive increasing research support services as a big opportunity; however, they are constrained by gaps in their staff skills, knowledge confidence and resourcing issues. From the study, only 15% of the respondents had training on bibliometrics and 28.6% had it on research data management. Majority of the academic libraries, about 80% reported that, their staff learned the bibliometrics and the research data management knowledge and skill on the job across all the countries. Furthermore, there was a growing involvement of academic libraries providing bibliometrics research support services to researchers. For instance, impact calculation for academic units; citation report for
grant applications; promotion and tenure. But with the involvement of research data management, it was revealed to have a lower level of involvement”.

2.9 Researcher’s perception and expectations of academic libraries and librarians

University libraries purchase various research materials and resources to facilitate teaching, learning and research. Faculty members would have a positive perception of the contribution of the library to their research; teaching; and learning activities if only current or updated; timely; quality; adequate information resources; and modern library facilities are available and accessible to them.

A study conducted by Hart and Kleinvelt (2011) on “the role of academic libraries in research and how researchers use their institution's library and their expectations at the Cape Peninsula University of Technology revealed that, over 65% of the faculty members continued to rely on the library for access to print and electronic resources. However few gaps occurred between the delivery of library services and researcher's desires, for instance, very few faculty members attended the library scheduled database training workshops yet most of the academics recognise database training as one of the library's key contribution to research. Most of the academics desired to be kept informed of the new resources in their field yet, only a minority experience this level of service and less than half expressed confidence in the discipline knowledge of the librarians”.

In the same vein, Gabbay and Shoham (2017) conducted a study which looked at the “perceptions of faculty members from the faculties of social sciences and humanities in connection with the roles of the library in assisting research and teaching. The findings revealed that, the contributions of the library services to the various aspects of teaching and research activities is perceived higher by the librarians than by the faculty members. The faculty members on the other hand, expected more from the library in various aspects of
research support. However, faculty members believed that, with their teaching needs, the
library met them. Gabbay and Shoham (2017) further opined that, with regards to research,
faculty members believed most libraries support the technical aspect. But they do not support
other aspects such as locating the complete information relevant to their research”.

The findings indicated that “the perception in libraries needs to change and also resolve the
differences between faculty and librarians perceptions. Faculty members are the resident
population of any academic institution and they greatly affect various aspects of the academic
library. Understanding their needs and attitudes towards the library by librarians would help
the library to meet their academic information needs. Faculty members are seen as providers
of research and teaching necessities” (Gabbay & Shoham, 2017). Tillack (2014) pointed out
that, “faculty members appear to be aware and know the importance of the library; however
in practice, they constantly reduce the budget of the library almost every year, thus making it
difficult to purchase the resources needed to run the library to support research and teaching
properly (Brown and Swan, 2007).

“Lecturers and postgraduates are among the users of the university libraries and their
perception of the libraries has influence on the use of the information resources. In a study
Survey method was adopted for the study and simple random sampling method was used to
select sample size of 38 lecturers and 233 postgraduates. Data was collected through a
questionnaire complemented by an interview schedule. Results revealed that the overall
perception was not favourable as 62% of lecturers and 77.7% of postgraduates indicated that
they were not satisfied with the resources and facilities in the library”.

Keeler (2006) in a study on faculty use and perception from an organisational culture lens,
the findings revealed that, there is a low faculty demand for library instructional services and
a poor relationship between faculty and librarians. Out of about 400 faculty members found
in the university, only 28 of them representing 7% of the total faculty made use of library instructional session, followed by 24 faculty representing 6% of total faculty scheduled for the library lessons and another 24 of the faculty representing 6% requested for this service.

2.9.1 Information-searching habits of faculty members

“A study of the patterns of use and of the information searching habits of faculty members in the library revealed that, many faculty members turn to external search engines if they do not quickly find the important information on the library website (Herman, 2001; Hoppenfeld and Smith, 2014). Many faculty members begin their searching process in external search engines, which they classify to be simpler than searching the library resources. Faculty thinks that, locating materials at the Google Abstract and Index (Google A and I) level is sufficient for their needs “(Harker and Kizhakkethil, 2015). “Faculty members do not always understand the professional terminology used by librarians and on the library websites and are not aware of the various vast materials available in the library” (Geetha et al., 2013).

“Many faculty members are either unaware of the online systems available in the library or do not understand them, and that, if they are aware of the existence of such systems, they do not know how to use them because librarians do not provide organised training for them” (Hollister and Schroeder, 2015). “Perceptual differences between faculty members and the librarians have resulted in this situation. Faculty members are unaware of the physical facilities and electronic resources available to them, whereas, the librarians do not understand the information needs of faculty members. Faculty also are not aware or do not value the capabilities of the modern library to assist them in information searching and this as a result end up with faculty members not informing their students of the capabilities of the academic library in providing assistance to them “(Hoppenfeld & Smith, 2014).
According to Creaser and Spezi (2012), “when a faculty member asks for the librarians’ assistance in information searching, it is due to their personal acquaintance and appreciation of the individual librarian. But in recent times, librarians who are responsible for the subscription of the database e-resources; seeing to the proper working of the databases; access to full texts; and checking on the importance of the databases for students and faculty members, have created conditions that can help identify the Internet Protocol (IP) range of the computer while searching is performed in Google scholar search engine such that, when the user searches for a particular topic, relevant materials that are available in the library are shown” (Mi, 2015).

2.10 Availability of infrastructure in Academic libraries in supporting research

“The computer has brought in a new impact on the library and information usage. In libraries, information technology has helped library experts or librarians to provide value added quality information services and give more remote access to the transnationally available information resources. In this digital era, there is a highly sophisticated information technology to facilitate the storage of huge amounts of data or information in a very compact space. Information technology (IT) promises fast retrieval of stored information and transform our idea of the functions of a traditional library and a modern information center. Technological developments have changed the mode of library operations and services. Academic libraries are providing various ICT-based services to their users, including the following: provision of web access to online public access catalogues (OPAC); electronic document delivery; networked information resources; delivery of information to user; online instructions; and online reader advisory services. Library and network are two structural concepts built for storing, disseminating and retrieving information worldwide. The concept of library in the academic environment is not only for acquiring, storing, lending and sharing local and remote
resources but also for building a common space for teaching, learning, research and training” (Rao & Choudhury, 2010).

A study conducted by Rao & Choudhury (2010) to find out the infrastructural facilities available in libraries in India revealed that, “majority of the library’s local network is a part of campus network. In use of network cables, both optical fiber and CAT5 enhanced cables hold an equal share of percentage. All libraries have internet connections, in which majority of them (60%) use leased connections. Fifty percent (50%) of the institutions had the network bandwidth of 6.0 Mbps and above. Consistently, all institutions had campus-wide network connections to various units including departments, in which 75% of them had connections to student’s halls/hostels and very few of them (25%) had connections to faculty’s and officer’s residences. This study also indicated that, the South zone (78%) libraries had more Network Infrastructure facilities than the other zone”.

2.11 Scholarly communication tools available in Academic libraries

“Information is the key factor in any kind of research and development. The information itself and way it is accessed have undergone a lot of changes owing to the development in Information Communication Technology. Quick and easy access to every required information is a ultimate importance especially in Academic Libraries” (Saleem, SZ, & Batcha, 2013).

Ebijuwa and Anyakoha (2005) define “Information Communication Technology (ICT) as “tools and as well as means used for collection, capture, process, storage, transmission and dissemination of information”. Modern ICT is impacting on the various aspects of libraries and the information profession. Developments in ICT and the wide spread use of ICT is resulting in digital information sources and digital media replacing and becoming the dominant form of information storage and retrieval. ICT survives and makes true rules of
library science „every reader his or her book or information”; „save the time of the reader”; „Library is a growing organism”. ICT with its tremendous information sources, rapid transmission speed and easy access ensures the satisfaction of the user with complex demand, breaks down the distance barrier and shortened the time required and ensures the right information to the right reader at the right time. It also increases and solves the library’s demand of collection development. It is really an excellent tool for the Library information centers” (Ebijuwa and Anyakoha, 2005).

A study conducted by Saleem, & Batcha (2013) on “the major application ICT tools such as e-group, e-mail, fax, Internet, Intranet, Mobile Phone, video conference, revealed that, all of the respondents use all the facilities but the highest was the mobile phone with (90%) followed by e-mail (89.09%); Intranet (86.36%); and Internet with (81.81%). The use of Mobile Phones was high due to its fast and easy way of communication”.

2.12 Collaboration of academic librarians and faculty members

Pham & Tanner (2015) defines “collaboration as a joint working, learning and sharing process that specifically focuses on the activities of teaching, learning and researching among educational participants, in which knowledge can be activated and transferred”. Whipple (1987) described “collaboration as an educational process which narrows the gaps of teaching, learning and research to create a more knowledgeable community”. The highlighting of this educational process is placed “on the contribution of cross-disciplinary teamwork to develop new ways of teaching; to project new learning experiences and to enable co-planning; co-implementing; and co-evaluating of students” progress throughout the instructional process” (Montiel-Overall 2005; Butler et al., 2004; & Corey, 2002).

“Librarians and faculty members are both involved in teaching students how to make use of the information resources available in their campus library. Partnership between faculty and
librarians is necessary to enhance students learning and research, and help them develop their information competencies. A key element of effective teamwork is knowledge of the attitudes of both groups” (Yousef, 2010). In a study conducted by Ducas & Michaud-Oystryk (2003) “at the University of Manitoba to explore librarians- faculty interactions, the study results showed that, faculty highly rated the librarians' role in the university and endorsed a greater level of interaction. The faculty rated them as follows in descending order of importance: information services, collection, information technology, research, and teaching/ instruction”.

In the same vein, Lucas (2011) discussing on collaborative librarianship and faculty in-service agreement with faculty members, agreed with Isaac-Menard that, the collaborative approach of librarians to educate or teach college or university faculty members about the library, could encourage them to engage and participate in service offered by the library, such as database training workshops; interlibrary loans; reference services; etc. He went on to say that, the more faculty members know about the library and the facilities available, the more they would use them. Again, well informed faculty or academics produces students who in the end will be interested in the library too. In-service training of faculty allows or gives librarians the opportunity to market the library research materials and services. A well-planned library in-service highlights the librarian's teaching and research skills.

2.13 Conclusion of literature

In this chapter, literature was obtained on research; scientific communication as well as scientific publications in the digital era; academic libraries; research support services offered by academic librarians to researchers; researchers’ perception and expectations of academic librarians; availability of infrastructure in libraries in supporting research; scholarly communication tools; and importance of libraries and information professionals or librarians to research community.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used in the study. This chapter provides an overview of the following: the research design; selection of the case; selection of subjects; population; sample size, and the sampling technique; instrumentation; mode of data collection; method of data analysis; presentation of results and problems encountered and limitations of the study.

3.2 Research Design and Method

According to Aina (2004) “the research design is the plan of study because it provides the total framework for collecting data”. In the same vein, Cooper and Schindler (2008) posit that, “research design is the outline for the collection, measurement and analysis of data”. It also shows the researcher, how data is collected and analysed (Hussey and Hussey, 1997). The mixed methods research design was used for this study. “Mixed methods research design is both a method and methodology for conducting research that involves collecting, analysing, and integrating quantitative and qualitative research data in a single study. The purpose of the mixed method approach is that, the combination of qualitative and quantitative research, gives or provides a better understanding of a research problem than either research approach alone” (Creswell, 2008).

The case study research method was chosen by the researcher for this study because, it is considered as a “robust research method particularly when a holistic; and an in-depth investigation and explanations of the social and behavioural problem are required. Through case study techniques, a researcher is able to go beyond the quantitative statistical results and understand the behavioural conditions through the actor’s view” (Zainal, 2007).
Benefits that are derived from the use of multiple case studies include:

a) the researcher is able to investigate the data collected within each situation;

b) the researcher is able to understand the similarities and differences between the cases and consequently can offer the literature with important impacts from its differences and similarities;

c) the evidence or results produced from a multiple case study is strong and reliable and the researcher can clarify if the findings from the results are valuable or not.

3.3 Selection of Case

The College of Health Sciences; the College of Basic and Applied Sciences; and the University Library system at the University of Ghana were selected as the case study for the research. The two colleges and the University library system were selected because; the College of Health Sciences and the College of Basic and Applied Sciences produce the scientific publications of the university. The University of Ghana library system also plays the role in promoting academic activities by acquiring, processing, organising and disseminating relevant, quality, timely and appropriate information in both print and electronic formats to enhance teaching, research, and learning.

“The University of Ghana library system (UGLS) comprises the Balme Library and other libraries in the various Schools, Institutes, Departments, Halls of Residence and the Accra City Campus”. The Balme Library; the School of Public Health Library; the School of Agriculture library; and the Medical School Library at Korle Bu were used for this study. The researcher believes that by assessing the strategic roles the University librarians play in facilitating the production of the publications by the academics in their research activities, in the two colleges under study, would bring to the notice of the university authorities on the
role or value of libraries in helping to have a positive impact on research activities in the university.

The College of Health Sciences has five (5) schools under it namely; School of Biomedical and Allied Health Sciences; School of Medicine and Dentistry; School of Nursing; School of Pharmacy; and the School of Public Health. The College also has an Institute for medical research purposes and a research centre namely Noguchi Memorial Institute for Medical Research and the Centre for Tropical, Clinical Pharmacology & Therapeutics respectively.

College of Health Sciences has six (6) satellite libraries supporting the schools and the departments. The school libraries under the College of Health Sciences have four (4) professional librarians and thirty-one (31) para professionals manning the libraries. The collection of materials both in print and electronic are peculiar to the college. The libraries depend on the main university library, thus the Balme Library for the electronic resources to support the research and teaching activities of the College.

In the same vein, the College of Basic and Applied Sciences has five (5) schools under it, namely; School of Physical and Mathematical Sciences; School of Biological Sciences; School of Agriculture; School of Engineering Sciences; and School of Veterinary Medicine. The College has six (6) research centres. Three (3) of the research centres are under the School of Agriculture, namely; Livestock and Poultry Research Centre (LIPREC); Legon Soil and Irrigation Research Centre (SIREC) Kpong; and Forest and Horticultural Crops Research Centre (FOHCREC) Kade. The rest of the research centres are Biotechnology Research Centre; West Africa Centre for Crop Improvement; and West African Centre for Cell Biology of Infectious Pathogens. The College of Basic and Applied Sciences also has two (2) Institutes under it and these are: Institute for Environment and Sanitation Studies; and Institute of Applied Science and Technology.
The College has twenty-three (23) departmental libraries with thirty-five (35) para professional manning them. The College of Basic and Applied Sciences depend on the university main library for the electronic databases to support the college’s research activities. The collections of library materials both in print and electronic are peculiar to the college.

Table 3.1: Statistics of the Colleges of Health Sciences and Basic and Applied Sciences

<table>
<thead>
<tr>
<th>Name of College</th>
<th>School</th>
<th>Research Centers</th>
<th>Departments</th>
<th>Institute</th>
<th>Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Health Sciences</td>
<td>5</td>
<td>1</td>
<td>43</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2. Basic and Applied</td>
<td>5</td>
<td>6</td>
<td>22</td>
<td>2</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: University of Ghana Website.

3.4 Selection of Subjects

This section of the methodology is about how the element or subjects for the study were selected. It consists of the population; the sample size and the sampling technique.

3.4.1 Population of the Study

Castillo (2009) points out that, a research population is generally a large collection of individuals or objects that is the main focus of a scientific query. Popoola (2011) defines population as the “totality of the items or objects under the universe of study”. The heads of the College of Health Sciences and the College of Basic and Applied Sciences gave the researcher the faculty staff lists from each college to help in the distribution of the questionnaires.
From the staff list, the total population of the faculty members of the College of Health Sciences and the College of Basic and Applied Sciences were six hundred and sixty-nine (669) that is, three hundred and forty (340) and three hundred and twenty-nine (329) from the two Colleges respectively. The population of the librarians from the university library system was twenty-one (21). The population distribution of the two Colleges is as follows:

**Table 3.2: Population of Faculty Members at the Colleges of Health Sciences and Basic and Applied Sciences**

<table>
<thead>
<tr>
<th>Name of College</th>
<th>Number of Faculty Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. College of Health Sciences</td>
<td>340</td>
</tr>
<tr>
<td>2. College of Basic and Applied Sciences</td>
<td>329</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>669</strong></td>
</tr>
</tbody>
</table>

*Source: Colleges of Health Sciences and Basic and Applied Sciences Registry*

Therefore the total population for the study was six hundred and ninety (690) that is, 669 from faculty members and twenty-one librarians” from the University Library System.

**3.5 Sampling Technique and Sample Size**

“Samples are the individuals who are selected from the population to participate in the research project” (Spata, 2003). The results from the sample can be used to make generalisations about the entire population as long as it is truly representative of the population (Creswell, 2009).
For the purpose of this study, the Simple Random sampling was used for this study. The reason for choosing this type of sampling is because, the simple random sampling removes bias by giving all individuals an equal chance to be chosen (McCabe, 2006).

The researcher used the online random number or sample size calculator to calculate the sample size for the study. The researcher keyed in the total number of faculty members in the College of Health Sciences and the College of Basic and Applied Sciences that is, three hundred and forty (340) and three hundred and twenty-nine (329) respectively into the calculator. A confidence interval (margin of error) of 5% and a confidence level of 95% confidence was used to calculate the sample size. The Random Number Generator on the internet was used to generate the list of the random serial numbers or the number of respondents used for the study. This is shown below:

1. **College of Health Sciences**

Random Number Generator

The Random Number Generator was used to create a list of random numbers, based on your specifications. The numbers generated appeared in the Random Number Table.

Enter a value in each of the first three text boxes.

Indicate whether duplicate entries are allowed in the table.

Click the Calculate button to create a table of random numbers.

<table>
<thead>
<tr>
<th>How many random numbers?</th>
<th>181</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
<td>1</td>
</tr>
<tr>
<td>Maximum value</td>
<td>340</td>
</tr>
</tbody>
</table>
181 Random Numbers

<table>
<thead>
<tr>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>247 021 107 324 098 074 189 124 309 014 101 258 040 164 339 283 219 321 261 100 051</td>
</tr>
<tr>
<td>330 097 071 095 073 306 189 306 215 022 022 213 320 319 102 199 107 105 333 149 117</td>
</tr>
<tr>
<td>241 189 215 083 279 016 316 099 038 038 055 185 247 129 089 268 214 009 172 250 336</td>
</tr>
<tr>
<td>206 019 164 279 043 237 074 302 126 299 055 280 168 329 268 183 282 258 087 290 335</td>
</tr>
<tr>
<td>087 045 131 054 228 112 238 245 239 111 237 016 015 203 082 199 052 115 024 068 089</td>
</tr>
<tr>
<td>137 314 249 222 178 317 285 056 253 093 025 325 046 013 068 183 254 135 269 005 275</td>
</tr>
<tr>
<td>330 013 212 063 163 285 165 026 217 041 211 331 097 144 077 292 266 248 060 225 222</td>
</tr>
<tr>
<td>180 272 328 159 056 304 322 339 135 332 203 201 082 281 054 279 013 076 288 127 268</td>
</tr>
<tr>
<td>334 265 066 248 072 067 296 053 281 312 093 174 108</td>
</tr>
</tbody>
</table>

Specs: This table of 181 random numbers was produced according to the following specifications: Numbers were randomly selected from within the range of 1 to 340. Duplicate numbers were allowed. This table was generated on 3/2/2018.

2. College of Basic and Applied Sciences

Random Number Generator

The Random Number Generator was used to create a list of random numbers, based on the specifications. The numbers generated appeared in the Random Number Table.

Enter a value in each of the first three text boxes.

Click the Calculate button to create a table of random numbers.

How many random numbers? 182.

Minimum value 1

Maximum value 329
182 Random Numbers


Specs: This table of 182 random numbers was produced according to the following specifications: Numbers were randomly selected from within the range of 1 to 329. Duplicate numbers were allowed. This table was generated on 3/2/2018.

The total sample size for the two Colleges was three hundred and sixty-three (363). For the librarians, purposive sampling was used to obtain seven (7) out of the twenty-one (21). The purposive sampling was used for the librarians because, they are seen as the key informants who have enough knowledge about the libraries and their contribution to research activities. The librarians used for the study comprised the University Librarian, heads of Electronic Resources, Digitisation and Institutional Repository, and Students’ Reference units; School of Public Health librarian; Medical School librarian, Korle-Bu and School of Agriculture librarian.

3.6 Instrumentation

“Instrumentation is generally the process of collecting data and this involves the selection of the instrument as well as the conditions under which the instrument would be administered.
There are various methods of finding data about a project or research. The methods could be documentary sources, mail questionnaire, interviewing and observation” (Osuala, 2005). The case study research method, the researcher used for the study has a range of methods and tools to investigate phenomena and these tools include interviews, questionnaire, observations, and documents. This study adopted two instruments to collect data and these were questionnaires and interview schedule.

3.6.1 Questionnaire

“A questionnaire is a document or form containing a number of questions on a particular theme, problem, issue or opinion to be investigated” (Kumekpor, 2002). The decision to use questionnaire was influenced by the following reasons; large amounts of information can be collected from a lot of people within a short period of time and it is also relatively cost effective; it is practical; the results of the questionnaires can usually be quickly and easily quantified by either a researcher or through the use of a software package; can be analysed more scientifically and objectively than other forms of research; and when data has been quantified, it can be used to compare and contrast with other research and may be used to measure change (Gillham, 2008).

However, using a questionnaire has these challenges; lacks validity; is argued to be inadequate to understand some forms of information, that is changes of emotions, behaviour and feelings; there is no way to tell how truthful a respondent is being; varying levels of subjectivity and lack of personal contact. Researchers’ control over questionnaires is lost when they are sent to the respondents. The questionnaires for the study had six (6) sections which were based on the objectives of the study.

a) Section A of the questionnaire aimed to obtain the demographic information;
b) Section B looked at the library’s research support services provided by Librarians. Using a five (5) point Likert scale with 1(Poor); 2(Adequate); 3(Good); 4 (Very Good); and 5 (Excellent). It was used to rate the perception of faculty members about the research support services in the library.

c) Section C focused on the library services provided by Librarians;

d) Section D looked at the computer infrastructure facilities available in the library;

e) Section E determined the communication tools used to communicate with faculty and library users;

f) Section F looked at the assessment of librarians and libraries by faculty members by using a five (5) point Likert scale with 1(Not Aware); 2 (strongly Disagree); 3 (disagree); 4 (Agree); and 5 (Strongly Agree).

The researcher ensured that, the questionnaire was clear to be understood by participants. Self-administered questionnaire were distributed to participants to collect data at the College of Health Sciences and the College of Basic and Applied Sciences. The data collection process lasted for six (6) weeks. Some challenges encountered by the researcher included non-availability of participants who were selected to participate in the research; and delays in returning the filled questionnaires. Each questionnaire was numbered to enable the researcher identify missing questionnaires.

A total of three hundred and sixty-three (363) questionnaires were distributed by the researcher. Out of the three hundred and sixty-three (363), two hundred and four (204) valid responses were obtained which represents 56.1% of the participants contacted. To get the response rate, the number of completed survey or filled questionnaire returned is divided by the number of participant contacted and then multiplied by 100%. For this study, the response
rate was obtained by dividing the two hundred and four (204) valid responses by the number of participants contacted (363) multiplied by 100%.

The response rate = No. of completed survey/No. of participant contacted * 100% = 56.1%.

This response rate was good for the researcher to carry out the research. The participants in this research, that is the faculty members, it was difficult for the researcher to reach them and retrieve the filled questionnaires from them. This could be due to faculty busy schedules and the nature of their work. This is supported by Babbie (2007) who states that, “A review of the published social research literature suggests that a response rate of at least 50 percent is considered adequate for analysis and reporting”.

3.6.2 Interviews

Kvale (1996) regards interviews as “an exchange of views between two or more people on a topic of mutual interest, and the importance of human interaction for knowledge production”.

The researcher interviewed the University Librarian; the Head of electronic resources; Head of student reference; Head of digitization and institutional repository unit; Librarian at the College of Health Sciences (Korle Bu); Librarian at Public Health; Librarian at the School of Agriculture. An interview guide was prepared and guided by the researcher. Permission was sought for from the interviewers before any of the information from the interview was recorded. Each interview session took thirty-five (35) minutes to complete.

The interview guide had six (6) sections.

a) Section A sought to obtain the demographic information of the librarians;

b) Section B dealt with the services librarians offer to faculty members to support their research activities;
c) Section C looked at the research support services provided by the library to faculty members to enhance their research activities;

d) Section D also looked at the communication tools used by librarians in the library;

e) Section E dealt with the collaborative efforts between faculty members and Librarians; and

f) Section F looked at the perception of faculty members by librarians in relation to the use of the library and its facilities.

3.7 Pre-testing

The data collection stage of the research process typically begins with pre-testing. Lavrakas (2008) states that, “pre-testings are "dress rehearsals" of full survey operations that are implemented to determine whether problems exist that need to be addressed prior to putting the production survey in the field". Pre-testing was conducted at the College of Health Sciences and the College of Basic and Applied Sciences to determine the effectiveness and appropriateness of the research instrument. The questionnaire and interview schedule were pretested to ascertain the reliability and validity of the research instrument. Ten (10) questionnaires were distributed to the faculty members who were not selected in the random sampling for this exercise in the College of Health Sciences and the College of Basic and Applied Science, five (5) questionnaires for each College. The pre-testing allowed for modification of the questionnaires and afforded the researcher the needed skill for data collection.
3.8 Data Collection

3.8.1 Mode of Data Collection

Primary and secondary sources of data were collected for the study. The primary source of data was from the face-to-face interview with the seven (7) librarians from the University of Ghana Library system, that is the University Librarian, heads of Electronic Resources, Digitisation and Institutional Repository, and Students’ Reference units; School of Public Health librarian; Medical School librarian, Korle-Bu and School of Agriculture librarian and the questionnaires (204) from the faculty members from the College of Health Sciences and the College of Basic and Applied Sciences.

The researcher used secondary data as well. Report from the University of Ghana Registry; Congregational Report and the University website. “Secondary data is public information that has been collected by others. It is normally free or cheap to obtain and can act as a strong foundation to any research exercise” (Wolf, 2016). Examples are Government Statistics; Market Research Reports; Institutions Websites etc.

Data collection for the study began in May, 2018 at the College of Health Sciences and the College of Basic and Applied Sciences. A letter of Introduction was acquired from the Department of Information Studies to seek permission from the College of Health Sciences and the College of Basic and Applied Sciences to undertake the study and also gave the heads of these Colleges, the reasons or rational behind the study. The researcher personally administered the questionnaires to the faculty members of the Colleges under the study and conducted an interview with semi-structured interview questions for the University Librarian; the head of Electronic Resources; head of Student Reference; head of Digitisation and Institutional Repository unit; librarian at the College of Health Sciences Medical School (Korle Bu); librarian at the School of Public Health; and the librarian at the School of Agriculture library. The researcher explained the questions on the questionnaires to the
faculty members who were selected to participate in the research so that they could understand and correctly answer the questions.

The interview was conducted at the offices of each interviewee. Anonymity, confidentiality and obtaining the consent of the respondents were the three ethical issues of great concern in the study. Before conducting the interviews, all the respondents were assured of the fact that, the research or the study was strictly an academic activity and were assured of confidentiality in the treatment of their responses. Permission was then sought by the researcher from the interviewees to record their responses of the interview. During the interview, the researcher observed the body language of all the interviewees to enable the researcher understand the occurrence.

3.9 Data Analysis

“Data analysis requires that the researcher be comfortable with developing categories and making comparisons and contrasts” (Creswell, 1994). Data was analysed using the Statistical Package for Social Sciences (SPSS). The package was used to find the percentages, frequencies, mean values and standard deviations of the variables in the questionnaire. Content analysis was used to analyse the data from the interviews were presented in a form of reports under thematic areas.

After the interview of all the interviewees, the recorded data from each interviewee was transcribed so that no data would be lost. The interviews were summarised knowing that more than one theme would exist in a set of interviews. When the themes were identified and were significant to the concepts of the study, they were written down (Morse & Field, 1996) constituting relevant responses for the discussion and inserting such responses from the interviews where applicable into the analysis to either agree or contrast responses gathered
through the questionnaire. Relevant responses were cited where appropriate together with the analyses of the data gathered with the use of the questionnaire.

3.10 Ethical Considerations

According to Creswell (2009) “researchers need to protect their research participants; develop some trust with them; guard against mistrust and promote the integrity of the research”. Ethical issues or considerations in a research are the codes and conduct of researchers that would help protect the research participants and the research as a whole.

The following ethical considerations were applied to ensure proper code of conduct before, during and after the research and they are as follows:

a) Introductory letters were obtained from the Department of Information Studies and presented to the College of Health Sciences; the College of Basic and Applied Sciences; and the University Library in order to seek permission to conduct the research in the colleges, and the libraries;

b) The purpose of the study were made clear to respondents and a convenient day and time were scheduled to conduct interviews with the University librarian and the heads of departments of the Electronic support unit, Digitisation and Institutional Repository unit, Student Reference unit, the librarians at the School of Agriculture, Public Health and Medical School Korle Bu. In the course of the interview, the researcher assured the respondents of confidentiality of the information they provided and that it was strictly for academic purposes;

c) Every individual respondent involved in the research consent was sought by the researcher to ensure voluntary participation. The researcher assured individual participants that, their responses were anonymous and confidential;
d) All sources and references of literature or information used for the study were duly acknowledged by the researcher; and

e) Lastly, the code of conduct for research as pertained to the University of Ghana was adhered to by the researcher.
CHAPTER FOUR

DATA PRESENTATION AND FINDINGS

4.1 Introduction

This chapter presents the findings of the research study. Basically, the chapter presents the findings of the study with particular reference to the responses received after collecting and collating data from academic faculty members from the College of Health Sciences and the College of Basic and Applied Sciences from the University of Ghana. The chapter sets out by presenting the following: the background of respondents, the research support services provided by the University of Ghana library and librarians. After which the computer infrastructure facilities in the library are assessed. In addition, the communication tools employed to facilitate and enhance library services in this technological and knowledge-based era are also presented and discussed. The final bit of the findings in this chapter focuses on an assessment of library services and librarians by academic faculty members of the colleges.

Two hundred and four (204) valid response rate which represented 56.1% were obtained from the participants contacted with the questionnaires. This response rate is good. This is supported by Babbie (2007) who states that, “A review of the published social research literature suggests that a response rate of at least 50 percent is considered adequate for analysis and reporting”.

4.2 Categories of Respondent

Primary data for this study was collected from the respondents in the College of Health Sciences and the College of Basic and Applied Sciences. A total of 204 respondents were interviewed during the survey. As can be observed from Figure 4.1, majority of the respondents interviewed were lecturers representing 43.1 percent. This was followed by
senior lecturers who accounted for 28.9 percent of the respondents. Assistant lecturers constituted 16.6 percent whilst research fellows accounted for 0.5 percent of respondents. This information can be seen in Fig. 4.1.

Figure 4.1: Categories of Respondents

*Source: Survey, 2018.*
In terms of academic qualifications, 19 percent of the respondents had a Master of Art, Master of Science or Master of Philosophy. The remaining 81 percent had obtained Doctorate degrees.

![Education Level of Respondents](image)

**Figure 4.2: Educational Attainment**

*Source: Survey, 2018.*

Table 4.1 below presents the duration of service of respondents. Approximately 4 out of 10 respondents had worked for at least 10 years with approximately 30 percent having worked for 11 to 20 years. The lowest proportion of respondents had working experience of 30 years and above.
Table 4.1: Length of Service

<table>
<thead>
<tr>
<th>Work Experience</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10 years</td>
<td>81</td>
<td>39.7</td>
</tr>
<tr>
<td>11-20 years</td>
<td>61</td>
<td>29.9</td>
</tr>
<tr>
<td>21- 30 years</td>
<td>45</td>
<td>22.1</td>
</tr>
<tr>
<td>30 years and above</td>
<td>17</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


4.3 Library Services Provided by Librarians

In the libraries of the various departments, a number of library services are provided. From the survey, a total of seven (7) services were identified as being provided by librarians (see figure 4.3). The most dominant service provided by librarians across all the libraries is training on e-resources of databases, this accounted for 42.6 percent of respondent’s choices.
Figure 4.3: Catalogue of Services Provided by Librarians


The service which is rarely provided by librarians is inter-library loan and document delivery which accounted for 1.5 percent of choices. As can be seen from the graph, 7.9 percent of respondents could not choose library services provided by librarians because these respondents did not use the library.

4.4 Computer Infrastructure Facilities and Services in the Library

Technology plays a critical role in every field and the library is no exception. Technology is seen as a catalyst or facilitating mechanism in any field or sphere. From figure 4.4, a total of 8 different Information Technology (IT) infrastructure and services were identified during the survey. This ranged from E-catalogue services, online services, virtual reference, and communication network facilities among others. The most used IT service in the libraries is E-catalogue which includes online public access catalogue whilst the least used service is the E-current awareness services.
4.5 Communication Tools Available at the Library

To facilitate communication and interaction between faculty staff and librarians, a number of communication tools are employed and used by the libraries. The survey revealed that six (6) main communication tools or media are used to ensure communication between librarians and faculty members. From figure 4.5, the most used communication means is the electronic mail (e-mail) with 65.2 percent of the respondents using this means as the main mode of communication. Next to e-mail is directly enquiring from the librarian which was used by 16.2 percent of the respondents. The least used communication modes were video conferencing, intranets and telephones which recorded 2 percent each.
4.6 Research Support Services Provided by the Library/Librarians

Research support services have always been provided by academic libraries. The study sought to find out which research support services are being provided to support faculty.

A study conducted by Kennan & Afzal (2014) on “research support provided by academic libraries in the UK, Australia, New Zealand and Ireland, 219 questionnaires were distributed, and 140 valid responses were obtained. It was revealed that, most of the academic libraries are providing research support services in the areas of bibliometrics and data management. Academic libraries perceive increasing research support services as a big opportunity, however, they are constrained by gaps in their staff skills, knowledge confidence and resourcing issues”.

From this study, only 15% of the respondents had training on bibliometrics and 28.6% had it on research data management. Majority of the academic libraries, about 80% reported that,
their staff learned the bibliometrics and the research data management knowledge and skill on the job across all the countries.

4.6.1 Assessment of Librarian’s Research Support Services by Faculty Members

This section assesses the research support services provided to faculty members by librarians. To achieve this, faculty members of the College of Health Sciences and the College of Basic and Applied Sciences assessed the key research support services based on their perception and expectations. The research support services assessed are: maintaining of research repositories; advice on bibliographic referencing; providing relevant reading list and advice on literature review; database training, advice on research topic; and bibliometric analysis services.

4.6.1.1 Maintaining of Research Repositories

Figure 4.6 presents faculty member’s perception on the maintenance of research repositories. From the graph, 5.4 percent of faculty members were of the view that the maintenance of the libraries research repositories were poor. Also, 34.8 percent of faculty members indicated that the maintenance of these repositories were good. Interestingly, 10.8 percent could not rate the maintenance of the repositories because they indicated that they were unaware of the existence of this service provided by the library.
4.6.1.2 Advice on Bibliographic Referencing

With respect to bibliographic referencing advisory support services provided by librarians, 24.5 percent (majority) of faculty members using the likert scale rated this service provided by librarians to be good, 18.1 percent of faculty perceived the service to be adequate whilst 6.4 percent constituting the minority of respondents rated this service as excellent. Approximately, 2 out of 10 faculty members indicated not applicable because such faculty members had never benefitted from such services hence could not rate the service. Also, 15.2 percent of respondents were of the view that the bibliographic referencing advice provided by librarians was poor. This suggests that the service did not meet the expectation of these faculty members.

Table 4.2: Perception on Bibliographic Referencing Advice

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Adequate</td>
<td>37</td>
<td>18.1</td>
</tr>
<tr>
<td>Good</td>
<td>50</td>
<td>24.5</td>
</tr>
<tr>
<td>Very good</td>
<td>32</td>
<td>15.7</td>
</tr>
<tr>
<td>Excellent</td>
<td>13</td>
<td>6.4</td>
</tr>
<tr>
<td>Not applicable</td>
<td>41</td>
<td>20.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*Source: Survey, 2018.*

4.6.1.3 Providing Relevant Reading List and Advice on Literature Review

In the area of literature review support, 17.2 percent of faculty members rated this service as poor whilst only 2.9 percent rated the service as being excellent. Majority of the respondents (22.5%) who rated this service indicated that the literature advice was adequate. A total of 28 percent of respondents could not rate the literature review service provided by librarians because these category of respondents have never benefitted from this service.
Table 4.3: Perception on Reading List and Literature Review Advice

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>35</td>
<td>17.2</td>
</tr>
<tr>
<td>Adequate</td>
<td>46</td>
<td>22.5</td>
</tr>
<tr>
<td>Good</td>
<td>45</td>
<td>22.1</td>
</tr>
<tr>
<td>Very good</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Excellent</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>57</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*Source: Survey, 2018.*

4.6.1.4 Database Training

Database training is one of the services provided by librarians to various faculty staff. An assessment revealed that 25 percent of faculty members constituting the majority of respondents indicated that the database training provided was good with 4.4 percent indicating that it was excellent. Approximately 2 out of 10 faculty members rated the database training provided as being poor. Again, 17.7 percent were not in the capacity to rate database training provided by librarians because these faculty members have never received database training.
Table 4.4: Perception on database training

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>39</td>
<td>19.1</td>
</tr>
<tr>
<td>Adequate</td>
<td>22</td>
<td>10.8</td>
</tr>
<tr>
<td>Good</td>
<td>51</td>
<td>25.0</td>
</tr>
<tr>
<td>Very good</td>
<td>47</td>
<td>23.0</td>
</tr>
<tr>
<td>Excellent</td>
<td>9</td>
<td>4.4</td>
</tr>
<tr>
<td>Not applicable</td>
<td>36</td>
<td>17.7</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>100.0</td>
</tr>
</tbody>
</table>


4.6.1.5 Advice on Research Topic

Research topic advisory services given to faculty members by librarians were largely considered as poor as 38.2 percent alluded to this. Only 2 percent of respondents indicated that this service was very good. Approximately 3 out of 10 faculty members could not rate the research topic advice of librarians because such faculty members have never benefitted from such a service. This underscores the relatively low level of research topic advice provided by librarians to their respective faculty staff.
Table 4.5: Perception on Research Topic Advice

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>78</td>
<td>38.2</td>
</tr>
<tr>
<td>Adequate</td>
<td>33</td>
<td>16.2</td>
</tr>
<tr>
<td>Good</td>
<td>27</td>
<td>13.2</td>
</tr>
<tr>
<td>Very good</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Not applicable</td>
<td>62</td>
<td>30.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


4.6.1.6 Bibliometric Analytical Services

Bibliometrics which is a quantitative analysis of publications helps explore the impact of publications or publishers in a particular field of study. An assessment of the bibliometric services provided by librarians revealed that 6.9 percent and 15.2 percent of faculty staff rated the service as good and very good respectively.
Table 4.6: Perception on Bibliometric Analytical Services

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>56</td>
<td>27.5</td>
</tr>
<tr>
<td>Adequate</td>
<td>25</td>
<td>12.3</td>
</tr>
<tr>
<td>Good</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Very good</td>
<td>14</td>
<td>6.9</td>
</tr>
<tr>
<td>Excellent</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Not applicable</td>
<td>76</td>
<td>37.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*Source: Survey, 2018.*

4.7 Summary Descriptive Statistics on Research Support Services

The five point likert scale (where 1=Poor, 2=Adequate, 3=Good, 4=Very Good and 5=Excellent) was used to assess respondent’s perception on the research support services provided by librarians. Table 4.7 present summary descriptive statistics on faculty member’s perception of research support services offered by librarians. As can be observed from the table, maintaining of research repositories recorded the highest mean of 3.46 which is approximately 4. Using the likert scale for interpretation, it can be concluded that faculty members view this service provided by librarians to be very good. The service which recorded the lowest mean was advice on research topic. This recorded a mean of 2.18 approximately 2 which implies that the service was just adequate. There is therefore the need for librarians to do more when it comes to providing advice on research topic for faculty members.
Table 4.7: Descriptive Statistics on Perception of Research Support Services

<table>
<thead>
<tr>
<th>Research Support Service</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining of research repositories</td>
<td>182</td>
<td>3.46</td>
<td>1.069</td>
</tr>
<tr>
<td>Advice on bibliographic referencing</td>
<td>163</td>
<td>2.87</td>
<td>1.329</td>
</tr>
<tr>
<td>Providing a reading list on my topic and advice on my literature review</td>
<td>147</td>
<td>2.73</td>
<td>1.445</td>
</tr>
<tr>
<td>Database training</td>
<td>168</td>
<td>3.05</td>
<td>1.498</td>
</tr>
<tr>
<td>Advice on research topic</td>
<td>142</td>
<td>2.18</td>
<td>1.555</td>
</tr>
<tr>
<td>Bibliometric analysis services</td>
<td>128</td>
<td>2.57</td>
<td>1.683</td>
</tr>
</tbody>
</table>


4.8 Assessment of Libraries and Librarians

Faculty members were given the opportunity to assess the libraries and librarians using five key parameters ranging from library collections and resources, subject knowledge of librarians, need for strong research culture by librarians, provision of current information on research as well as institutional repository at the library. The results of the assessment are presented below.

4.8.1 Library Collections and Resources Support Research

Respondents were asked whether library collections and resources could not support research efforts of faculty members. From the survey, 61.8 percent of respondents disagreed (strongly disagree = 24.5% and disagree =37.3%) with this assertion whilst 22.1 percent agreed (agree = 15.2% and strongly agreed = 6.9%) with the statement that the libraries collections and resources could not support research efforts. Only 5.4 percent of respondents could not respond to this question because such respondents did not make use of the library and 10.8 percent were undecided.
Table 4.8: Assessment of Library Collections and Resources

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>Undecided</td>
<td>22</td>
<td>10.8</td>
</tr>
<tr>
<td>Disagree</td>
<td>76</td>
<td>37.3</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>50</td>
<td>24.5</td>
</tr>
<tr>
<td>Agree</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>14</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


Majority of respondents (61.8%) disagreeing with the statement that “library collections and resources cannot support research” is an indication of the fact that indeed the collections and resources at the libraries support research of faculty members. However, with approximately 2 out of every 10 faculty members agreeing to the same statement implies that there is the need to increasingly align the collections and resources at libraries to the research interests and priorities of faculty members.

4.8.2 Subject Knowledge of Librarians to support Research of Faculty Staff

With respect to subject knowledge of librarians to support research, 45.1 percent of respondents disagreed (disagree=29.9% and strongly disagree = 15.2) to the statement that “librarians do not have the subject knowledge to help my research” whereas 39.7 percent of respondents agreed with the statement that “librarians do not have the subject knowledge to help my research”.
Table 4.9: Assessment of Library Collections and Resources

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>9</td>
<td>4.4</td>
</tr>
<tr>
<td>Undecided</td>
<td>22</td>
<td>10.8</td>
</tr>
<tr>
<td>Disagree</td>
<td>61</td>
<td>29.9</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Agree</td>
<td>63</td>
<td>30.9</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>18</td>
<td>8.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


From the above, quite a large proportion of faculty members approximately 4 out of 10 are of the opinion that librarians do not have the subject knowledge to support research of faculty members. This is disturbing as some faculty members will not seek the help of librarians to provide research support thereby limiting the role of librarians to faculty members.

4.8.3 Need for Librarians to Build a Stronger Research Culture

Faculty members were asked whether there was the need for librarians to build a stronger research culture in the various libraries. Results depicted in table 4.10 indicate that only 7.4 percent of respondents disagreed to the statement that there is the need for librarians to build a stronger research culture. On the other hand, 84.4 percent of respondents agreed (agree = 42.2% and strongly agree = 42.2%) to the statement that there is the need for librarians to build a stronger research culture. The high percentage in support of the need for librarians to build a stronger research culture could be an indication of a low research culture in the libraries which needs to be strengthened or improved.
Table 4.10: Need for librarians to build a stronger research culture

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Undecided</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td>Disagree</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Agree</td>
<td>86</td>
<td>42.2</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>86</td>
<td>42.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


4.8.4 Librarians update faculty members on the latest research information

From the survey, 36.7 percent of respondents agreed (agree = 23% and strongly agree = 13.7%) to the statement that librarians updated faculty members on latest research. This shows that some librarians do provide latest research information to faculty members. However, 51 percent of respondents disagreed (disagree = 39.2% and strongly disagree = 11.8%) with the statement that librarians updated faculty members on latest research. This implies that on average 5 out of 10 faculty members do not receive latest research information from librarians. This is worrying and indicates that there is a gap in this area that needs to be filled by librarians.
Table 4.11: Librarians provide latest research information

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>21</td>
<td>10.3</td>
</tr>
<tr>
<td>Disagree</td>
<td>80</td>
<td>39.2</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>24</td>
<td>11.8</td>
</tr>
<tr>
<td>Agree</td>
<td>47</td>
<td>23.0</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>28</td>
<td>13.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*Source: Survey, 2018.*

4.9 Descriptive Statistics on Assessment of Libraries and Librarians

The five point likert scale below (see table 4.12) was used by respondents to assess the librarians and libraries using four main items. Table 4.13 presents descriptive statistics on the assessment. In analyzing table 4.13, it can be observed that the first item which is “the library collections and resources cannot support research” recorded a mean figure of 2.63 approximately 3. Using the likert scale, it can be concluded that respondents strongly disagree that the library collections and resources cannot support research. In other words, the survey findings confirm that the libraries collections and resources can support research.

Table 4.12: Likert Scale used in Assessment

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*Source: Author’s Construct, 2018*
Table 4.13: Descriptive Statistics on Librarians and Libraries Assessment by Faculty Staff

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The library collections and resources cannot support research</td>
<td>193</td>
<td>2.63</td>
<td>1.094</td>
</tr>
<tr>
<td>Librarians do not have the subject knowledge to help my research</td>
<td>195</td>
<td>2.87</td>
<td>1.213</td>
</tr>
<tr>
<td>Librarians needs to build a stronger research culture</td>
<td>199</td>
<td>4.09</td>
<td>1.151</td>
</tr>
<tr>
<td>Librarians are upgrading me on the latest information for my research</td>
<td>200</td>
<td>2.81</td>
<td>1.271</td>
</tr>
</tbody>
</table>

*Source: Survey, 2018.*

With respect to the second item – “Librarians do not have the subject knowledge to help my research”, a mean figure of 2.87 was recorded which is approximately 3. Again, using the likert scale for interpretation, it can be concluded that respondents strongly disagree that librarians do not have the subject knowledge to help the research of faculty members.

On the issue of the need to build a stronger research culture, a mean figure of 4.09 was recorded which implies that respondents agree to the need for a stronger research culture to be built and sustained in the various libraries by librarians.

In the case of librarians updating faculty members on the research latest information a mean figure of 2.81 was recorded. As a result, it can be concluded that respondents strongly disagree that librarian’s update faculty members on latest research information. Conversely, librarians are not updating faculty members on latest research information.
4.10 Findings from the interview by Librarians

4.10.1 Introduction

This section presents the data obtained from the interviews conducted with the librarians at the University of Ghana Library. Total numbers of participants interviewed were seven (7). The purpose of the interview was to confirm or contrast with the findings which emerged from the data from the questionnaires. For the sake of anonymity, the interviewees will be represented by Respondent (R1-R7)

The main themes covered in this section were: background of interviewees; services provided by librarians to the faculty members at the College of Health Sciences and the College of Basic and Applied Sciences; research support services provided by librarians to enhance the research activities of faculty members at the Colleges of Health Sciences and Basic and Applied Sciences; communication tools librarians use to communicate with the faculty members at the Colleges of Health Sciences and Basic and Applied Sciences; how researchers are collaborating with the librarians to facilitate research activities at the Colleges of Health Sciences and Basic and Applied Sciences; and the perception of librarians about faculty members in relation to research activities, and the use of the libraries and facilities.

4.10.2 Background Information

The interviewees background revealed that, two (2) of the librarians had obtained the Doctorate degrees; another four (4) had the Master of Philosophy degrees and the remaining one had obtained the Master of Art degree.

4.10.3 Services provided by the Librarians

During the interviews, I sought to find out the services provided by librarians to faculty members. The interview revealed the following: Respondent 1 said:
R1 “we offer Article Request services; chat with the librarian; and also assign subject librarians to the various colleges and departments to liaise with faculty members and attend to their information needs”

The second and third respondents continued by saying that:

R2 “we make sure faculty members and other users of the library enjoy our services such as providing them with access to the research publications; helping them search through the Online Public Access Catalogue (OPAC); reference management services for instance the use of Mendeley and Endnote; Faculty Research Commons for faculty alone and Knowledge Commons for undergraduates; and training on electronic databases”

R3 “oh! We just offer basic reader services and referral services to our users. We give out books and as part of our referencing services, we direct users to appropriate literature for their research works. You know, we compliment the main university library which is the Balme library”

The Respondent 4 had interesting services to share:

R4 “our focal services are archiving research publications; students theses and publications within the university. It could be Reports or Presentations. We also have the Institutional Repository containing the publications of faculty members in the university”

The last three respondents (5, 6, 7) offered:

R 5, 6, & 7 ” we provide online services email services; collections of books and materials, references, thus directing library users to the right information sources, creating a quiet place for users to read and learn; train our users to use the library catalogues and electronic database resources”.
4.10.4 Research Support Services

Four (4) respondents gave their views on the research support services offered by the librarians and their responses were as follows:

“we offer off-campus access to electronic resources; chat with the librarian; subject librarians to the Colleges and departments; provision of Faculty Research Commons; Institutional Repository, by showing the University of Ghana research publications available online for users to know the source of publications; trained staff providing reference management services such as Mendeley and Endnote”

Another respondent gave this as an answer:

“well, for research support services, we have provided for electronic service orientation; access to the OPAC and electronic resources training for library users and faculty members; teleconferencing facilities for faculty members who want to do presentations online; periodic organisation of workshops by professionals for researchers in the University on their research activities; exhibition for professorial and inaugural lectures organised in the library to support faculty research activities; conference facilities for researchers; multimedia facilities for researchers; provision of Turnitin software to help researchers with their work.
We have a lot of services to support our researchers”

One senior librarian as a respondent gave an interesting response to the question and it went as follows:

“We profile faculty research needs and then the librarians in the library do the searches for faculty members in the college; content analysis of new periodicals are done and given to faculty members based on their research areas to facilitate their research activities”
Last but not the least, the last respondent said this:

“We offer digitisation services; Sakai, an electronic learning system that support our stakeholders or users with their research works and has specific tools on that platform including plagiarism checker; bindery; photocopying; library guide services to our users

However, one senior librarian lamented greatly in the interview saying, faculty members do not patronise these services we offer them. The respondent puts it this way:

“Hmmm! My dear, it will surprise you that, with all of these research support services offered by the library, faculty members do not patronise ooo! For instance, one day, there was a workshop on research organised by the Balme Library and faculty members in the University were asked to register online for the research training programme. One hundred (100) faculty members registered but on the day of the workshop, only twenty-four (24) turned up. Fortunately or unfortunately, this time, the Vice-Chancellor was part of the workshop, He was so angry with the faculty members”

Three (3) other respondents mentioned similar things about the research support services. This is the summarised view of one of the respondents

“Faculty members are indifferent about the library so they do not use the resources available in the library”

4.10.5 Communication tools used by Librarians

Through the interview, it was revealed by one senior librarian, the respondent 2 that, communication tools used by librarians are as follows:

“ librarians in the University of Ghana use the University website platform; University Teachers Association of Ghana (UTAG) platform; Academic Quality Assurance unit;
orientation of Deans and new academics; subject librarians as a means of communicating with faculty members; and one-on-one communication with faculty members”

Respondent 2 gave his answer as follows about the communication tools used by librarians:

“We use notices at the Faculty Research Commons; subject librarians; electronic mails; telephones; intranet; online library chat system; facebook; and the library website”

Respondent 4 brought out interesting communication tools they use in their library and puts it this way:

“We use the whatsup and text messages a lot to communicate with our faculty. I think, they love that and they quickly respond to the messages whenever we send them messages on these platforms. We use the emails also”.

Respondent 5 came up with this answer when asked about the communication tools used in their library.

“We use the email broadcast; telephones; intercom; face-to-face visitation; and facebook”

4.10.6 Collaboration of Librarians and Faculty Members

The interview with the librarians brought out the following collaborative efforts between the faculty members in the Colleges of Health Sciences and Basic and Applied Sciences and the librarians as follows;

Respondent 1

“We collaborate with the faculty members in the Colleges and departments through the subject librarians who serve as a liaison between the library and faculty members; collaborate through the College and departmental based training workshop on electronic resources, turnitin and reference management software”
The collaborative efforts between the librarians and faculty members are sum up as follows by Respondent 2:

“We make faculty members aware of what we have for them, then they come to us with their information needs. The library displays new arrival of books and other materials for about one month in the library and then mails are “sent to faculty to inform them about the display of materials in the library. This attracts faculty to come and see what we have for them”

The third Respondent said that:

“Well, you see, because now there is a lot of information readily available online, faculty members do not rely on the library at all”

An interesting response came from the 5th Respondent and is sum up as follows:

“For me, understanding of faculty members is key. As an information person, faculty thinks I am not a scientist so I cannot help them. And I the information person also think that, faculty is not patronising and cooperating with the library. However, generally I would say, it is being progressive, though there are challenges”

4.10.7 The perception of librarians about faculty members

With the issue of perception of librarians about faculty members, librarians came up with these points.

Respondent 1

“Perception now is good. They perceive we are relevant to their research needs. Earlier on the engagement has been very low but now better. We have databases that support their research; the library now have training sessions for them to do easy research. For instance,
training in terms of reference management tools such as Mendeley and Endnote, Sakai etc. Faculty members now request for training in Sakai and e-resources for research purposes”

Respondent 2, a senior librarian puts it this way:

“My dear, it looks like faculty members do not understand that, the way they viewed the library some time ago has changed. Things have changed but faculty do not see the library in that light. I have what I call ,Faculty disease”. This is a situation where the library is seen as a place of old dusty books and you do not get what you want. But now, the links leading you to all important research sources of information are available in the library now, electronic books are here now. The library subscribes to them all, and it makes retrieval of information easy. The Article Request form is available, in case you search for an article and you do not find it, request for it online at the library and the librarian will search for it for you”

Respondent 3 was of the view that, because of the internet, faculty think that whatever they need can be gotten from the internet so they do not think they need the library and he puts it in this way:

“Faculty members are so indifferent to the use of the library. And because of the internet, they do not rely on the library at all”

Respondent 4 was of the view that,

“Faculty members use the internet services a lot. Maybe most of them may not be aware of the library resources and facilities online for them, but those that know, the sit in the comfort of their offices and use them”
4.10.8 The challenges faced by Librarians in working with Faculty Members

The challenges librarians face in getting the faculty members were captured in the following responses from the respondents. From the interview, four (4) of the respondents alluded to similar views and this is captured by respondent 7 as:

“Getting the faculty members to the library is difficult. Librarians think faculty members do not have the time to come to the library because of their busy schedules and the nature of their work”

Respondent 5 said that:

“Transportation to the various off campus units, for instance, Korle Bu library could be a challenge getting a means of transport there. This is because the university library bus is not always available. Lastly, sometimes facilities such as the internet could be working very well at the library but when one moves outside the library, it might not work at all and this poses a great challenge to librarians, faculty members and other users of the library”

4.10.9 The way forward for librarians

When asked from the interview the way forward, Respondent 1 said:

“We should keep on inviting them, one day they would come”

Respondent 2 added:

“Faculty members should renew their minds about the old idea they had about the library and know that, things have changed in the library. Now there are up to date information materials available to meet the research needs of faculty members. There is an availability of electronic resources subscribed by the library to satisfy researchers and users of the library. Facilities at the various departmental libraries in the university need to be improved to serve the library users and faculty members”
Respondent 3 gave his view as:

“Augment our online resources or facilities and improve our book stock to be able to meet the reading needs of our users”.

Respondent 4, 5 and 6 said similar about the librarians themselves and the facilities they have and this is captured by respondent 6 as:

“We have to be proactive and market our services and facilities in the library to the faculty members and other users of the library”

Last but not the least, the 7th respondent summed up his views as:

“There should be a library day on the time table of each College in the University every semester. This will help in creating so much awareness among the researchers and faculty in the Colleges and in the University as a whole”.

4.11 Chapter Summary

This chapter has presented the research support services provided by libraries and librarians, the computer infrastructure facilities available in the libraries, the communication tools employed to facilitate and enhance library services in this technological and knowledge-based as well as an assessment of library services and librarians by academic faculty members of the colleges surveyed. The results of the interview by librarians on the services they provide to faculty members; the research support services they provide; the communication tools they use in the library to communicate with their users especially the faculty members in the Colleges under study; as well as their perception about the faculty members in the use of the library and facilities of the library have also been presented.
CHAPTER FIVE

DISCUSSION AND INTERPRETATION OF RESULTS

5.1 Introduction

This chapter discusses the results of the study based on the objectives outlined in the study. The research set out to explore the role of librarians in supporting research activities in the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana. Based on a mixed method approach, data was collected from librarians and members of faculty from the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana, using questionnaires and structured interviews.

The specific objectives of the study were as follows; to explore the services offered by librarians to support research activities at the University of Ghana; to find out the faculty perception and expectations of librarians’ support towards their research activities; to find out the availability of infrastructure and resources at the libraries to support research activities; to find out the current collaboration that exist between librarians and the academics; to find out the scholarly communication tools available in the libraries and finally based on the findings, make recommendations to increase the value of librarians and their services to enhance research at the University of Ghana.

The discussion was carried out in relation to the Leortsher (1982, 1988 and 2000) theory of Collaboration. The constructs in the theory of collaboration include coordination, cooperation and partnership, integrated instruction and integrated curriculum. The discussion begins with a profile of the categories of respondents, services offered by librarians to support research activities, faculty perception and expectations, availability of infrastructure and resources, current collaborations that exists and current communication tools utilised by the libraries and librarians.
5.2 Demographic Characteristics of Respondents

The study explored three major demographic variables. These include the categories of respondents, their educational qualifications and the years of services. These variables were explored so as to put the study into perspective. From the study it was revealed that the majority of respondents representing 88 (43.1%) were lecturers while the least category of respondents 1 (0.5%) were Research fellows. The high rate of lecturers as recorded in this study could be attributed to the fact that, it might be the entry point for many members of faculty in academia. In addition, the low numbers of research fellows is suggestive of the fact that, most lecturers retire in their old age and decline extension. This is further confirmed by the educational attainment of most respondents where the majority of respondents 165 (80.9%) had PhD while the least category of respondents 39 (19%) had MA/MPhil/Msc. This could be as a result of the new University policy where the minimum qualification required to lecture in the university is a PhD.

Also, it was revealed from the study that, the majority of lecturers 81 (39.7%) had taught in the university for between 1-10 years. This was closely followed by those who had taught between 11-20 years who represented 61 (29.9%). In general, it could be concluded that the majority of the faculty members had taught in the university for a relatively longer period. Therefore, given their wealth of experience, they were therefore in a position to judge the services provided by the library. The interviewees background revealed that, two (2) of the librarians had obtained their Doctorate degrees; another four (4) had the Master of Philosophy degrees and the remaining one had obtained the Master of Arts degree.

5.3 Library Services Provided by Librarians

In the view of Isaac-Menard (2012), libraries and librarians play a very critical role by supporting research and collaborating with other academics in academia in the production of scholarly communication and research publications. In view of this, the study sought to
explore the services offered by librarians to support research activities within the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana. Interviews with librarians suggested that, they offered a wide range of services including basic reading and referral services, article request service, online and e-mail services etc. Despite the above responses from lecturers across the two faculties, the findings revealed that training and workshops on electronic resources of databases as suggested was the most popular service patronised among members of faculty. This could be as a result of the fact that, faculty members placed much premium on e-resources and databases as compared to the remaining services such as library print resource, place of study. The growing popularity of databases has compelled most lecturers to seek knowledge on how to use them. This probably accounts for the low responses on library’s print resources and quiet study area which both recorded 38 (18.6%) and 25 (12.3%) respectively.

The ability of lecturer to access these databases from any remote location has reduced the number of faculty members who visit the library. This has also resulted in the low patronage of other services provided by the library such as binding of books as stated by 16 (7.8%) and reference and information services as stated by 11 (5.4%) of respondents. The findings of the present study confirms the assertion of Cox and Vesbaran (2016) who posit that the digital era gives the ability to access information by using simple, fast and electronic means which has invariably changed scholarly communication or transformed scientific communities to "Scientific networks".

The digital era accounts for the growing popularity of academic databases. It is therefore not surprising that majority of lecturers paid more attention to training in the use of academic databases. Another finding worth noting is the fact that, a cross section of lecturers 16 (7.8%) indicated that, they were not aware of any of the services rendered to members of faculty by librarians. This could be attributed to low level of publicising and marketing of these services
by librarians. Despite the low figures, it should be of concern to management to adopt new strategies in marketing and promoting these services to faculty and other users of the library.

The fact that, some members of faculty 38 (18.6%) and 25 (12.3%) indicated that, they still visit the library to research and use print resources indicates the extent to which some individuals still prefer hardcopy materials to softcopy materials. This further buttresses the findings made by Bulger et al. (2011), where it was revealed that, some faculty members still esteem highly the printed materials in the library which according to them affects and influence their research activities.

For instance Saunders (2015), in his interview with faculty members from the Humanities claims that, “it is necessary for the researcher to experience the surroundings in which he or she works and in addition, experience the academic library as a working environment and as a place in which to use materials”. Another reason that could be attributed to some members of faculty’s attachment to print materials as compared to e-materials could be the fear of using technology. This has often deterred most lecturers especially the older generation from utilising e-resources and academic database.

5.4 Faculty Perception and Expectation of Research Support Services Provided by Librarians

According to Loertscher’s (2000) model B (cooperation) which states that, the relationship between the librarians and the researchers or faculty members should be cordial such that an atmosphere of trust and collegiality would be communicated between those involved in the partnership. However, this can only be achieved when there are positive perceptions and expectations from both parties who are supposed to be collaborating.

This section of the study sought to assess the perception of faculty members on research support services provided by librarians and to determine if the services provided met their
expectations. To achieve this, faculty members of the College of Health Sciences and the College of Basic and Applied Sciences were asked to assess the key research support services based on their perception and expectations. Six key variables were explored for this particular objective. They include maintenance of research repositories; advice on bibliographic referencing; providing relevant reading list and advice on literature review; database training, advice on research topic; and bibliometric analysis services. 34.8 percent rated the maintenance of institutional repositories as good, 24.5 percent representing the majority of faculty members rated advice on bibliographic referencing as also good and 46 (22.5%) and 45 (22.1%) also rated the reading list and literature review advice as either adequate or good respectively.

Meanwhile one-third of respondents also indicated database training was good, majority 78 (38.2%) rated research topic advice as poor and 37 (76.3%) representing the majority of lecturers indicated they did not patronise bibliometric analysis services. From the ongoing findings, it could be deduced that, maintaining of research repositories, bibliographic referencing and related literature review advice and database training were relatively good. However, libraries and librarians were handicapped when it came to advice on bibliometric analysis. This could be attributed to the low level of knowledge of most librarians when it comes to research.

As put forth by Tijssen (2007) the low level of publishing output by members of faculty in Africa and to be more precise Ghana has a trickling down effect on librarians who are also expected to publish as a requirement for promotion and other incentives. The fact that most librarians were not publishing made them a bit handicapped when it comes to issues of research. It was therefore not surprising that, bibliometric analysis services and advice on research were rated poorly or non-available by most lecturers. However, it is also
possible that while these services especially for bibliometric analysis was available, it was not highly publicised. The reason for the high “not available” responses.

It could be deduced from the above that, while advice on bibliographic referencing; maintaining of research repositories; and database training were likely to increase collaboration between librarians and faculty members, the perception of faculty members of librarians being deficient when it comes to issues of research such as advice on research topics and bibliometric analysis services had the tendency to reduce the level of co-operation.

5.5 Computer Infrastructure Facilities and Services in the Library

Investments in computers and other infrastructural facilities have been described by many authors such as (Majid et al., 2001; Iwhiwhu & Okorodudu) as a factor which may well determine the kind of services offered to faculty members by libraries. The efficiency of services in any library is therefore very much dependent on the quality of the infrastructure present which is contingent on massive financial support. Collaborations are most often reliant on the availability of infrastructure which facilitates the communication process.

In view of the above, the study sought to find out the availability of infrastructure and resources at the libraries to support research activities in the College of Health Sciences and the College of Basic and Applied Sciences at the University of Ghana. Some computer and ICT infrastructure that were assessed include e-catalogue services, online catalogue services; virtual reference service, communication network facilities, e-circulation services; support services e-publishing services, e-current awareness services.

Existing literature on the availability of ICT infrastructure in developing countries like Ghana, have reported a decline or non-availability of adequate physical ICT infrastructure to facilitate the use of ICT in academic libraries (Majid et al., 2001; Iwhiwhu & Okorodudu, 2012). Though the situation exists in more advanced developed countries, the situation is precarious in Africa. This has largely been blamed on poor funding which could partly be
attributed to the low recognition of academic libraries. The findings of the present study however revealed that, E-catalogue services such as the Online Public Access Catalogue (OPAC) was highly available as indicated by the majority 87 (42.6%) of members of faculty. This was closely followed by online services such as e-books; e-journals; abstracts; database; and open access journals as indicated 39 (19.1%) of respondents. The popularity of such services could be attributed to a high level of internet connectivity as posited by Rao & Choudhury (2010), whom in their assessment of infrastructural facilities available in libraries in India revealed that, majority of the library’s local network is a part of campus network which therefore enabled access to the OPAC and other e-books whether on campus or off-campus. The OPAC been the most utilised ICT services could be attributed to its ease of use and possibly because it is the first tool to consider when searching for information about the library’s collection.

However, the least ICT service available was e-current awareness services such as current contents, Selective Dissemination of Information (SDI), news alerts, new arrivals, newspaper clippings. This could be attributed to low awareness or marketing of such services. It was therefore not surprising that support services such as training users in the type of services offered by the library, user orientation and education was also rated poorly as indicated by 8 (4.0%) members of faculty. Most users of academic libraries are only aware of the traditional services provided by the libraries. It is therefore imperative for libraries to market new services that maybe available but members of faculty and other users may not be aware of.

5.6 Collaboration between Librarians and Faculty Members

“Collaboration is a joint working, learning and sharing process that specifically focuses on the activities of teaching, learning and researching among educational participants, in which knowledge can be activated and transferred. According to Yousef (2010), partnership between faculty and librarians is necessary to enhance learning and research, and help in the
development of their information competencies. An important element of effective collaboration therefore is knowledge of the attitudes of both groups involved in the collaboration process”.

The study therefore sought the views of librarians on the collaborating mechanisms being adopted so as to improve teaching and learning in the university. Two major themes emerged from the interview. The use of subject librarians served as Liaisons Officers to create awareness of the services and facilities in the libraries. In the view of librarians, awareness creation brought librarians into partnership with faculty members. While another librarian intimated this was often achieved through subject librarians who tend to understand members of faculty better about their information needs by virtue of their basic knowledge in some subjects.

It is however obvious from findings that, efforts by librarians to collaborate with members of faculty was often frustrated by the seemingly lack of acknowledgement by faculty members of the role of librarians. As intimated by one of the interviewed librarians, members of faculty did not perceive librarians to have the intellectual capacity to offer support anytime they encountered challenges in their research. This was partly attributed to the differences in their areas of expertise. A wrong notion in the view of the researcher which needs to be erased.

Lastly, it also emerged from the interviews that a challenge facing collaboration between librarians and faculty is the advent of information explosion. With the era of the internet where any material could be found online, many lecturers did not see the need to consult librarians. This placed a very huge impediment to effective collaboration in the view of librarians who were interviewed. The above findings of the present study contrast that of Ducas and Michaud-Oystryk (2003) who in their study at the University of Manitoba to explore librarians- faculty interactions revealed that, “faculty members highly rated the
librarians’ role in the university and endorsed a greater level of interaction. Collaborations were mainly in the field of information services, collection, information technology, research, and teaching or instruction”.

The above challenges as championed by Librarians defy the basic tenets of collaboration as posited by Loertscher’s (2000) theory, model C (Integrated Instruction) which states that there must be a good working environment which is flexible and trustworthy, based on the parties” involvement in the shared vision; shared objectives; shared planning; shared thinking and shared creation of integrated instruction to improve the academic achievement of students and faculty members alike.

5.7 Communication Tools Available in the Library

According to Saleem & Batcha (2013) “information is a key factor in any kind of research and development”. Information has undergone tremendous changes owing to the development of Information Communication Technology. Consequently, quick and easy access to information between lecturers and librarians is of ultimate importance especially in academic libraries. Loertscher’s (2000) theory, in the model B (Cooperation) places emphasis on a certain amount of networking as a precondition. Networking is a way for people to get to know each other and is important in building trust (Austin, 2000). In the view of the researcher, networking can only be achieved if there is a variety or mediums for both Librarians and lecturers to communicate effectively.

Ebijuwa and Anyakoha (2005) highlights the importance of communication tools in libraries when he indicates that, “communication tools are mostly used for collection, capturing, processing, storage, transmission and dissemination of information”. In view of the above, communication tools available in the libraries at the College of Health Sciences and the
College of Basic and Applied Sciences for the purpose of communication between faculty members and librarians in the University of Ghana.

Findings from the perspective of lecturers suggest that electronic mail was the most popular mode of communication as indicated by 133 (62.5%). This was followed by “Ask the Librarian” which recorded 33 (16.2%) per the data collected. Telephones were found to be the least used medium of communication as intimated by 4 respondents representing 2.0% of respondents. This finding was corroborated by from the interview with librarians from 3 of the college libraries who confirmed they mostly used e-mails in communication.

The present findings however contradict the findings of Saleem, SZ, & Batcha (2013) whom in their study discovered that, the major application ICT tools patronised was the mobile phone as put forward by (90%) of respondents who took part in their study. From the on-going, it could be concluded that, the use of e-mail services as a means of communication could be attributed to the fact that, it is a cheaper mode of communication and it enables librarians to reach a wider audience faster. Saleem, SZ, & Batcha (2013) however also suggest that the use of mobile phones was a faster and easier way of communication though it may come at a very high cost which is dependent on the availability of adequate funds.

It was however interesting to note that, in the era of instant messaging apps such as WhatsApp and Messenger, these apps were not highly used by the librarians in reaching out to members of faculty as 8 (4.0%) of respondents indicated it was the most patronised tool for communication. Like the e-mails, instant messaging apps also reach out to a broader number of library users; and faculty members and are timely. The above discussion partially satisfies Loertscher’s (2000) theory. The researcher is however of the view that multiple modes of communication so as to reach a wider diverse audience could be adopted.
5.8 Assessment of Libraries and Librarians

User satisfaction is a concept derived from service quality which is based on whether readers are satisfied with the services provided them or vice versa. Service quality has frequently been viewed as a set of evaluation techniques and strategies that belong to the business world and had nothing to do with libraries. Therefore, the earliest challenge to performance measurement in libraries was the absence of a benchmark for directly quantifying service quality in libraries. In recent times, the global rivalry among service providers to deliver quality services to please users of academic libraries has necessitated the evaluation of library services.

Based on the above, the study set out to assess the libraries and librarians under study using key parameters. The parameters include the library’s collections and resources; knowledge of subject librarians; present culture of librarians in research and the provision of current information on research. Library collections in the context of this study encompasses reading materials; both print and electronic. The argument of some library users has been that, the range and quality of books is not enough. Troll (2011) is of the view that the decline in acquisitions may be due to the heightened cost of materials.

With regards to the adequacy of library collection and resources, evidence from this study indicates that, the majority of lecturers (84.3%) disagreed that, library’s collection and resources were inadequate to support research. Similarly, staff with the requisite knowledge, skills, competence and efficiency constitutes the core and critical resources of any library. The contact person is critical to superior service delivery (Hinson, 2006). According to Bohlander et al (2001), human capital includes the individual’s level of capability, their skills and knowledge that lead to effectiveness in an organisation. Hence, for libraries to ensure quality service delivery to members of faculty, depends on having qualified, effective, and highly performing staff (Kont & Jantson, 2013).
The findings from the study suggest that, a slight majority 63 (30.9%) of faculty members held the view that, librarians did not have the requisite subject knowledge to aid research. This however contrasted the views of the slight minority who felt otherwise. The above finding is further corroborated by respondents when the overwhelming majority in terms of aggregate 84.4% (42.2% strongly agree and 42.2% agree) held the view that, librarians of both faculties needed to build a stronger research culture. The view of the majority of lecturers who held the view that, librarians did not have the requisite knowledge to aid in their research was further echoed by one of the librarians who was interviewed and complained to the fact that, most lecturers did not perceive librarians to have the intellectual capacity to aid them in their research.

According to Michnik (2014) “when librarians cannot live up to rational myths due to a lack of resources, the situation is different. Here one could say that, it is possible to adapt, for instance, by developing staff skills and competences but this adaptation is prevented due to financial cuts, and a lack of time and competence rather than ideological causes”. Furthermore, “customers attach top priority to reliability of the service and responsiveness from service personnel” (Manjunath & Shivalingaiah, 2004). This applies to librarians who are the direct point of call when faculty members visit the library.

However, the findings from this study suggest that, the majority 80 (39.2%) of faculty members held the view that, librarians did not update them on the latest research information. Finally, a tabulation of the mean of all questions posed under this theme revealed that, key among issues with regards to the assessment of libraries and librarians by members of faculty suggest that, library collections were rated highly while the lack of update on latest information for research purposes appears to be a persistent and serious challenge in the college libraries studied. This means librarians need to pay much more critical attention to addressing this problem.
In summary, libraries require the right quantity and quality of resources continuously in order to deliver quality library services to patrons. This implies that, providing materials in all formats are to be up-date to conform to the needs of faculty members and other library users. Libraries staff should have appropriate education and skills. Furthermore, sufficient funds should be provided to support, expand, and sustain existing services while introducing new services. The major finding from the above objective does not conform with Loertscher (2000) theory which states that, trust in the capabilities of collaborating partners is key to achieving effective partnership.

5.9 Conclusion of Discussion

The discussion of findings was done with continuous reference to the reviewed literature and Loertscher’s (2000) theory as employed in the study. It emerged from the discussion of the findings that, training workshops on e-resource was the most patronised service by members of faculty despite the several services offered by librarians. Also, e-catalogue services such as the Open Public Access Catalogue were the most popular facility used by lecturers which could be attributed to its ease of use and popularity among the services provided. Lecturers also opined that, e-mails were the most common mode of communication tool used by librarians to communicate with them.

Librarians attested to this indicating that, it had the ability to reach a wider audience and is cheaper. The assessment on librarians’ research support services from the perspective of lecturers did not rate advice on research topics and bibliometric analysis services highly. Lastly, most lecturers indicated that, librarians needed to increase their culture in research so as to enhance effective collaboration. Librarians interviewed however complained of how most lecturers did not find them intellectually capable in assisting them in their research.
CHAPTER SIX
SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The chapter presents the summary, conclusion and recommendations of the study. The summary presents a brief description of the study. The conclusion touches on the important issues found out in the study and based on the findings, the recommendations have been made. The study sets out to explore the role of librarians in supporting research activities.

Two colleges were selected for the purpose of this study. They include the College of Health Sciences and the College of Basic and Applied Sciences in the University of Ghana.

Objectives guiding the study included the following:

a) to explore the services offered by librarians to support research activities within the „College of Health Sciences“ and the „College of Basic and Applied Sciences“ at the „University of Ghana“;

b) to find out from the faculty members of the „College of Health Sciences“ and the „College of Basic and Applied Sciences“, their perception and expectations of librarians’ support towards their research activities at the „University of Ghana“;

c) to find out the availability of infrastructure and resources at the libraries to support research activities in the „College of Health Sciences“ and the „College of Basic and Applied Sciences“ at the „University of Ghana“;

d) to find out the current collaboration that exist between the librarians and the academics in the „College of Health Sciences“ and the „College of Basic and Applied Sciences“ in the University of Ghana;
e) to find out the scholarly communication tools available in the libraries at the „College of Health Sciences” and the „College of Basic and Applied Sciences” used to communicate with faculty members in the University of Ghana; and

f) to give recommendations based on the findings on the value of librarians and their services to enhance research at the „College of Health Sciences” and the „College of Basic and Applied Sciences” at the „University of Ghana”.

To accomplish the objectives, faculty members or lecturers were selected from the „College of Health Sciences” and the „College of Basic and Applied Sciences”; and librarians from the University of Ghana Library System (UGLS) to participate in the study. In all, there were 211 participants – 7 Librarians and 204 lecturers from the two Colleges under study.

6.2 Summary of Findings

The analysis of data from the survey questionnaires, structured interviews revealed the following findings based on the study’s research objectives.

6.2.1 Demographic Profile of Respondents

From the study, majority of the respondents who took part in the survey were lecturers who had taught in the university between a period of 1-10 years and were mostly PhD holders. Similarly, the demographic profile of librarians revealed that all them had a Master’s degree or above. This made respondents knowledgeable to bring about the information required for the study.

6.2.2 Library Services Provided by Librarians

With regards to the library services provided by librarians to faculty members, despite the varied range of services provided by the college libraries as stated by the librarians, survey of lecturers revealed that the overwhelming majority 42.6% were mostly aware and participated in training and workshops on the use of electronic databases. The least patronised services
were the inter-library loan services; binding services as indicated by 2.9% of lecturers and document delivery services as indicated by 1.5% of lecturers.

6.2.3 Faculty Perception and Expectation of Research Support Services provided by Librarians

In trying to find out from faculty members’ perception and expectations of librarians’ support towards their research activities at the University of Ghana, the majority of lecturers 34.8% rated the maintenance of institutional repositories as good as opposed to 5.4% who felt it was very poor. Similarly, enquiries into the advice on bibliographic referencing were also rated good by 24.5% who represent the majority. Concerning the provision of relevant reading list and advice on literature review, there were mixed perceptions as 22.5% of faculty felt it was adequate, another 22.1% indicated it was good. Database training received an overwhelming support as 25.0% and 23.0% felt it was either good or very good respectively. Advice on research topic selection and bibliometric analysis as support rendered by librarians to lecturers were however rated poorly as the majority 38.2% of lecturers indicated advice on research topics was poor while another 27.5% of lecturers also indicated research services on bibliometric analysis was poor.

6.2.4 Computer Infrastructure Facilities and Services Available in the Library

In assessing the infrastructure and resources at the libraries to support research activities in the „College of Health Sciences“ and the „College of Basic and Applied Sciences“ at the University of Ghana, the findings from the perspective of lectures revealed that the most widely accessed Information Technology (IT) resource by the majority of faculty members (42.6%) is the e-catalogue services which includes online services such as e-books, abstracting database, and open access journals. On the other hand, e-publishing services; support services (such as training users in the library, user orientation); e-current awareness services (such as current content, new arrivals); and e-circulation service (for instance,
renewal of materials, check-out, and check-in) were opined by faculty as mostly unavailable for use in the library.

6.2.5 Collaboration between Librarians and Faculty

The findings based on an interview with librarians from the colleges that were investigated revealed the challenge facing librarians in their bid to collaborate with lecturers in improving their research. One of challenges as mentioned by a cross section of librarians was the lack of adequate knowledge in specific subject areas perceived by faculty members. This notion by most lecturers perceived librarians as not intellectually capable to support them with their research needs. Beyond this, librarians have made efforts to help lecturers when they had issues with searching for relevant documents, content analysis, digitisation services just to mention but a few.

6.2.6 Communication Tools Available for Research

The study further set out to find out about the communication tools utilised to improve interaction between the academics and librarians. The study revealed majority of faculty members (65.2%) indicated on the mode of communication used between the faculty members of the „College of Health Sciences” and the „College of Basic and Applied Sciences” and the librarians was the electronic mails (e-mail). However, instant messaging, video conferencing, intranets and telephones were revealed as not often used for communication purposes.

6.2.7 Assessment of Libraries and Librarians

An assessment of libraries and librarians from the perspective of faculty members revealed that, the majority of lecturers (37.3%) considered the present collection of their faculty libraries adequate as opposed to 15.2% of respondents who agreed. Similarly, with regards to the subject knowledge of librarians on faculty information needs, 29.9% disagreed they were
knowledgeable in their field of expertise while the majority 30.9% thought otherwise as they agreed. With regard to the need for librarians to have a strong culture of conducting research, the overwhelming majority in terms of aggregate 84.8% (42.4% agree and 42.4% strongly agree) agreed with this statement. Lastly, the majority of lecturers (39.2%) indicated librarians did not update them current information.

6.3 Conclusion

This study was set out to explore how librarians and members of faculty could collaborate in supporting research activities at the „College of Health Sciences” and the „College of Basic and Applied Sciences” in the University of Ghana with the aim of making recommendations based on the findings to increase the value of librarians and their services to academic activities in the university. Among the changing roles of librarians, faculty members still feel the important role of libraries and librarians. Clearly, from the study, it was quite evident that lecturers acknowledged the role of libraries and librarians in the university. This is evidenced from the research support some lecturers indicated they had received from librarians such as training in the use of databases so as to support faculty research and information needs.

Discussing the users and their respective needs and the strategy to satisfy those needs and demands, Cronin (1985), emphasised the exchange relationship between the quality of library service and user patronage; the more satisfactory the service, the higher the patronage.

From the study, it could be concluded that, despite the variety of services provided by the University of Ghana Library System as posited by librarians, training workshops on electronic databases was the most patronised among all the services. This goes to attest the changing role and nature of libraries as majority of lecturers did not patronise other services provided by libraries because these were services they could access elsewhere or were not aware of.
Perception of academics at the „College of Health Sciences” and the „College of Basic and Applied Sciences” on the services provided by academic libraries and librarians at the University of Ghana to support research activities, it could be observed that, faculty held the perception that, most librarians were incompetent when it comes to research advice on research topic and bibliometric analysis on their publications were rated poorly. This was further buttressed by their view that librarians needed to build a strong research culture. A number of reasons could be responsible for this perception, one of which includes the fact that, most faculty members perceived librarians as people without requisite skills and qualification to help them with their information needs. More importantly, low research among librarians could also be a contributory factor.

Also to facilitate and increase collaboration between librarians and faculty members, is mostly dependent on constant communication and on adequate infrastructure in the University of Ghana Library System to support research activities. It can be concluded that though there was adequate infrastructure but the mode of communication lacked diversity as the e-mail was the most used with more recent mediums of communication such instant messengers, WhatsApp, Facebook barely used as summarised by lecturers. Some people are more comfortable with a particular form of communication.

However, while basic services maybe available, challenges in infrastructure facilities such as the internet, could be working very well within the library but outside the library might not work at all. This poses a great challenge to librarians, faculty members at the „College of Health Sciences” and the „College of Basic and Applied Sciences”; and other library users. From the study, getting the academics of the „College of Health Sciences” and the „College of Basic and Applied Sciences” was difficult. This might be because; they do not have the time to come to the library and also might have been due to the nature of their work and busy schedules.
6.4 Recommendations

The study revealed challenges that affected effective collaboration between librarians and lecturers which ultimately could have led to an improved role of the librarian in scientific publication amongst members of faculty. The following recommendations are given based on the findings of the study;

6.4.1 Increased Awareness Creation using Multiple and Diverse Mediums of Communication

Aside the university website and e-mails which have been the most dominant modes of communicating information pertaining to the library, top management of the UGLS should consider other mediums of communication such as Facebook, WhatsApp, Twitter so as to be able to reach out to the diversity of people faculty of members. A database of lecturers could be compiled and intermittently broadcast messages sent out to them. The advantage of using instant messenger tools is that they are timelier and also easier to reach a wider target audience. With the recent status feeds ability of WhatsApp in particular, it is possible for librarians to advertise new products and services and also reach faculty members on feedback.

6.4.2 Increased Visibility on the University’s Website

Activities such as students’ admissions, symposia and conferences pop up every time someone visits the university website. The University of Ghana Library System can strategically have a banner similar to that of admissions, which would have the facilities; services; researchable materials and information available at the library popping up anytime someone visits the university website to check on what is happening at the University. This should be separate from the Balme Library’s page on the university website. This will go a step further to get the attention of faculty members who use the site who may then be prompted to visit the library’s page.
6.4.3 New Approaches of Marketing Library Services

There has been a gradual shift of the library as a structure to an open place without boundaries. The study suggests that, instead of librarians waiting for lecturers to come to the library, librarians could once in a while visit the offices of these lecturers with probably two new arrival of books in their department. This could also prompt lecturers to visit the library to see the remaining stock that may be available.

6.4.4 Visibility and Attitudes of librarians

Librarians should be affable, that is friendly and pleasant people who would attract people to the library for them to know what the library has to help them with the teaching; learning and research activities in the University. Librarians could be part of the programmes and research activities (such as the seminars; departmental staff meetings; workshops on research etc) held at the „College of Health Sciences” and the „College of Basic and Applied Sciences”. This will pave a way for the librarians to present, communicate and create the awareness needed for faculty to know about what is available for their research activities at the library.

6.4.5 Training and Research Capacity Building for Librarians

Research capacity building programmes should be instituted for librarians to improve library staff members” analytical skills for understanding and acting on data. Librarians should be trained to improve their capacity to be able to conduct basic research so as to boost their confidence amongst their peers from other faculties in the university. This could be further enhanced by organising joint training programs between librarians and their peers who are academics from the „College of Health Sciences” and the „College of Basic and Applied Sciences”.

Subsequently, librarians should be encouraged to collaborate with other members of faculty in articles that cover two distinct fields of endeavours. This could go a long way to increase
the skills of librarians and further enhance their knowledge especially as subject librarians. This should be carried out in accordance with each staff’s capacity and must be based on measurable objectives so as to enable them meet informational needs of the users of the library and researchers in the „College of Health Sciences” and the „College of Basic and Applied Sciences”.

6.4.6 Collaboration between Librarians and Faculty Members
There should be a measure of trust between the faculty members of the „College of Health Sciences” and the „College of Basic and Applied Sciences” and the librarians at the University of Ghana so as to facilitate collaboration for effective teaching and research work. When there is a measure of trust between the two parties, there is going to be a congenial atmosphere the two parties would work in. Librarians would be able to give out their best by providing best information sources and resources to meet faculty research and teaching needs.

6.4.7 Increasing of Inter library loan services
There should be an increase in awareness and sensitisation of the inter-library loan services in the UGLS for the academics of the „College of Health Sciences” and the „College of Basic and Applied Sciences”. There might be information resources that are needed for academic research work at the Colleges under study yet they might not be available for the researchers. Initiating more interlibrary loans for the faculty members will help meet their information needs.

6.4.8 Education of Faculty Members at the Colleges of Health and Basic and Applied Sciences
Librarians at the „University of Ghana” should carry the workshops, seminars and training programmes to the „College of Health Sciences” and the „College of Basic and Applied
Sciences” to educate faculty members on their skills and what is available at the library for them and their students. These workshops and seminars are to be done in consultation with the Deans and Heads of Departments in the colleges under study. They would organise their members for the librarians to educate them on services such as bibliometric analysis on faculty members’ publications, their impact their publications are having on the international knowledge community.

6.4.9 Computer Infrastructure Facilities and Service

Librarians should publicise their electronic current awareness service such as new arrivals of information and research materials to the faculty members at the College of Health Sciences and the College of Basic and Applied Sciences, for them to know of the current nature of the information and research materials available at the libraries.

6.4.10 Provision of Relevant Literature and Reading List

Librarians should be able to get involved with the research activities of faculty members at the „College of Health Sciences” and the „College of Basic and Applied Sciences”. This will help librarians to know faculty research areas and would be able to provide relevant literature to support their research activities.

6.4.11 Motivation and Transportation

Librarians should be motivated by the University authority by providing them with the required resources to run the library efficiently since no library can operate without adequate funds. There should be increased budgetary allocation to the libraries so as to enable them purchase the current information and research materials for the library to support research activities of faculty members or the academics. Designated transportation made available for librarians would solve all the transportation challenges thereby increasing the visibility of
library staff who are sometimes compelled to use their own funds in making deliveries to members of faculty.

6.5 Implication of the Study

Findings from the present study have both theoretical and managerial implications. The research adds to practice by drawing the attention of librarians on the possible challenges that hinder effective collaboration between librarians and members of faculty. Thus, libraries that intend to increase scientific publication must have an understanding of faculty needs in an ever dynamic environment. With regards to policy, it is believed that putting in place the necessary measure to develop staff competencies and skills in research, will publicise the scientific publications in the universities. With respect to the present study’s contribution to knowledge, though the research concentrated on the University of Ghana Library System, the findings are of value to librarians in other academic libraries.

6.6 Suggestions for further studies

Every research work encounters some limitations, and this study is no exception. In view of the above, the study proposes that, a much more in-depth study should be conducted to understand the perception of librarians and library services in the university.
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Dear Sir/Madam,

I am currently a student at the University of Ghana pursuing a Master of Philosophy in Information Studies. I kindly ask you for some minutes of your time to participate in an academic research exercise on “Scientific Publications in academia: the role of librarians”. The researcher is looking at the role librarians play in the production of Scientific Publications in Academia and would be grateful if you could help by answering the questions outlined in this questionnaire. You are assured that, your responses would be kept completely confidential and so you are not required to write your name or any other personal code that can be linked to you. Again your responses would be used for academic work only. Should you need clarification about the research, please contact:

Mercy Asafu-Adjaye

Cell phone: 0505031318

Email Address: ama.asafu-adjaye@uenr.edu.gh

(Please tick or write where appropriate)
A: BIOGRAPHICAL INFORMATION

1. Gender :  a. Male [ ]    b. Female [ ]

2. Age :    a. 30-40 [ ]    b. 40-50 [ ]    c. 50 and above [ ]

3. Work Experience:
   a. 1-10 [ ]    b. 11-20 [ ]    c. 21-30 [ ]    d. 30 and above [ ]

4. Highest Educational Qualification:
   a. MA/MPhil/MSc [ ]    b. PhD [ ]

5. Status:
   a. Assistant Lecturer [ ]    b. Lecturer [ ]    c. Senior Lecturer [ ]    d. Associate Prof [ ]    e. Prof [ ]

6. Which department or unit do you belong to? ..................................

SECTION B: THE LIBRARY’S PROVISION OF RESEARCH SUPPORT SERVICES

7. What is your perception on the following research support services provided by librarians?
   Kindly use the Likert scale below to rate your perception


<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maintaining of research repositories</td>
</tr>
<tr>
<td>2.</td>
<td>Advice on bibliographic referencing</td>
</tr>
<tr>
<td>3.</td>
<td>Providing a reading list on my topic and providing advice on my literature review</td>
</tr>
<tr>
<td>4.</td>
<td>Database Training</td>
</tr>
<tr>
<td>5.</td>
<td>Advice on my research topic</td>
</tr>
<tr>
<td>6.</td>
<td>Bibliometric Analysis Services</td>
</tr>
<tr>
<td>7.</td>
<td>Others (Please specify)</td>
</tr>
</tbody>
</table>
**SECTION C: LIBRARY SERVICES PROVIDED BY LIBRARIANS**

8. Which of the following library services & facilities have you benefited from? Please tick where applicable.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Training workshop on E-resources or databases</td>
</tr>
<tr>
<td>b</td>
<td>Library’s Print Resources</td>
</tr>
<tr>
<td>c</td>
<td>Faculty librarian’s reference/information services</td>
</tr>
<tr>
<td>d</td>
<td>Library’s Quiet Study Area</td>
</tr>
<tr>
<td>e</td>
<td>Library’s Inter-Library Loan &amp; document delivery services</td>
</tr>
<tr>
<td>f</td>
<td>Library’s E- resources (e-books, online journal databases etc)</td>
</tr>
<tr>
<td>g</td>
<td>Others (Please specify)</td>
</tr>
</tbody>
</table>
SECTION D: COMPUTER INFRASTRUCTURE FACILITIES IN THE LIBRARY

9. Which of the following infrastructural facilities are available in the library to support the research activities? Please tick where applicable.

<table>
<thead>
<tr>
<th>Computer-based services</th>
<th>Tick</th>
</tr>
</thead>
<tbody>
<tr>
<td>a E-catalogue services (Online public access catalogue, OPAC)</td>
<td></td>
</tr>
<tr>
<td>b E-circulation services (Check-out, check-in, renewals of materials)</td>
<td></td>
</tr>
<tr>
<td>c Virtual reference service (Online/e-mail assistance)</td>
<td></td>
</tr>
<tr>
<td>Online Services (E-books, E-journals, Abstracting database, open access Journals (free)</td>
<td></td>
</tr>
<tr>
<td>d Communication network facilities (Internet, e-mail services, video and Teleconferencing)</td>
<td></td>
</tr>
<tr>
<td>e E-current awareness services (Current contents/SDI/alert/ new arrivals/newspaper clipping)</td>
<td></td>
</tr>
<tr>
<td>f E-publishing services (E-library News, Newsletter)</td>
<td></td>
</tr>
<tr>
<td>Support services (training user in the library, user orientation/education/conventions)</td>
<td></td>
</tr>
</tbody>
</table>
SECTION E: COMMUNICATION TOOLS AVAILABLE AT THE LIBRARY

10. What Communication tools do librarians use in the library to communicate with faculty members? Please tick where applicable.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Emails</td>
</tr>
<tr>
<td>a)</td>
<td>Video Conferencing</td>
</tr>
<tr>
<td>b)</td>
<td>Instance Messaging</td>
</tr>
<tr>
<td>c)</td>
<td>Intranets</td>
</tr>
<tr>
<td>d)</td>
<td>Telephones,</td>
</tr>
<tr>
<td>e)</td>
<td>Teleconferencing</td>
</tr>
<tr>
<td>f)</td>
<td>Social media tools such as wikis, blogs, Facebook</td>
</tr>
<tr>
<td>g)</td>
<td>“Ask the Librarian”</td>
</tr>
</tbody>
</table>

SECTION F:

Please tick your views on the following statements. Kindly use the Likert scale below and add any comment.

11. “The Library collections and resources cannot support research”

<table>
<thead>
<tr>
<th></th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
12. “Librarians do not have the subject knowledge to help my research”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

13. “I source for information directly from the Internet and so no longer need the Library”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

14. “Now that I use e-resources, I don’t need to visit the physical library”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15. “Research is essential to my job”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
16. “Librarians needs to build a stronger research culture”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

17. “Librarians are updating me on the latest information for my research”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

18. “The Institutional Repository at the library is a very important service and resource”

<table>
<thead>
<tr>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

19. SECTION F: Please could you add any comment relevant to my investigation?

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Thank you for taking the time to complete this questionnaire
APPENDIX II

UNIVERSITY OF GHANA

DEPARTMENT OF INFORMATION STUDIES

TOPIC: SCIENTIFIC PUBLICATIONS IN ACADEMIA: THE ROLE OF LIBRARIANS

INTERVIEW SCHEDULE FOR LIBRARIANS

Date of Interview ………………………………

Position ...........................................

Biographical Information

Gender:

Age:

Work Experience:

Status:

QUESTIONS:

1) What are the services you provide to researchers or faculty members at the College of Health Sciences and the College of Basic and Applied Sciences to support research activities?

2) What are the research support services provided the library to faculty members at the College of Health Sciences and the College of Basic and Applied Sciences to enhance their research activities?
3) What communication tools are available in the library do you use to communicate with the faculty members or researchers at the College of Health Sciences and the College of Basic and Applied Sciences?

4) How are researchers or faculty members collaborating with you to facilitate research activities in the Colleges of Health Sciences and Basic and Applied Sciences?

5) What is your perception of faculty members in relation to research activities and the use of the library and its facilities?

6) What are the challenges you face in dealing with faculty members with regards to the use of the library and the way forward?

Thank you.