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ADOPTION AND USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN ACADEMIC LIBRARIES OF SELECTED PRIVATE UNIVERSITIES IN GHANA.

BY

ASMAWU ABUBAKAR

ID: 10255884

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DECLARATION

I hereby declare that except for references to other people's works which I have duly acknowledged, this thesis has been written by myself, and has not been submitted in previous applications for another degree.

STUDENT

ASMAWU ABUBAKAR

SIGNATURE.....

DATE.....17/05/2021.....

SUPERVISORS

DR MUSAH ADAMS

SIGNATURE.....

DATE.....17/05/2021.....

DR. EBENEZER ANKRAH

SIGNATURE.....

DATE.....17/05/2021.....

DEDICATION

This thesis is dedicated to my parents, Mr. Abubakar Shaibu Umar and Madam Jariatu Khalid. My beloved children, Intisar, Mariam, Rahma, and husband Mr. Abdul-Wahab Abubakar for their prayers, support, and patience throughout this journey of pursuing knowledge.

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ABSTRACT

The importance of Information and Communication Technology (ICT) in libraries cannot be over emphasized. The advent of information and communication technology has changed the way libraries operate in recent times, and private university libraries cannot be left out in the ICT revolution. Librarians have changed from simple storekeepers who were concerned with the protection of books against theft and mutilation, to information officers who encourage the use of information in the vast array of information material. Private university libraries have a lot of challenges in terms of level of adoption to ICT when compared to their counterparts in their public university.

In view of the above, this study set out to examine the level of ICT adoption in private university libraries in Ghana in terms of physical and to find out how committed the management of private universities are in acquiring ICT tools for to the libraries. The study further examined the capabilities and competence of both library staff and student in the use of ICT facilities and the level of satisfaction in the use of ICT in the various universities.

This study used the mixed method approach which involved adopting both the quantitative and qualitative approach. The study used thirty percent of the graduate students as the sample size. Therefore, sample size of the student's respondents was one hundred and eighteen (118). Since the population of the library staff was not too large the entire population of professional librarians and 6 paraprofessionals was used.

The research revealed that even though private universities have adopted ICT use in the libraries, there are challenges with training of staff in the use of ICT, and the lack of satisfaction with the work of technical people who do not understand the technicalities of the library work.

The recommendations given were that management of private universities should invest more in ICT facilities for the libraries. Library staff should also be given enough training in ICT so that they can be in better position to help their users. Again, the government should constitute a body to oversee the affairs of private university libraries so as to ensure conformity with the library standards.

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INTRODUCTION

1.1 Background of the Study

The importance of Information and Communication Technology (ICT) in libraries cannot be over emphasized. The advent of information and communication technology has transformed the way libraries operate in recent times. The libraries nowadays have changed from close-access libraries of earlier times to the present-day hybrid, digital, and virtual libraries. The accelerated adoption and use of information and communication technology has resulted in the globalization of information and knowledge resources (Kalam, Nasiruddin, & Sayeed, 2021).

As defined by Qutab and colleagues, the term ICT is used to express the hardware and software use for information transferring and conducting communications linked by a vast array of technological protocols. It again covers internet service provision, information technology equipment, media and broadcasting of library and documentation centres, network based information services and other many more" (Qutab, Bhatti, & Ullah, 2014).

However, according to Christenson, the term refers to technologies that provide access to information through telecommunications and it focuses primarily on communication technologies" (Christenson, 2006). These might include the internet, wireless networks, mobile phones and other communication channels. Communication can be defined as exchanging ideas, information, signals, or messages through appropriate media, enabling individuals or groups to seek information, to give information or to express feelings. Information and communication technology are the structure and component that enables modern computing.

Adoption means the action or fact of choosing to take up, follow, or use something. It can also mean, assumption, assuming, acquiring, taking on or acquisition of something. Nowadays it has become very important for libraries to adopt the technology for the betterment of the education sector (Dunmill & Arslanagic, 2006). Adoption is defined as the act of taking something on as your own. *Adoption* usually refers to the legal process of becoming a non-biological parent, but it also refers to the act of embracing ideas, habits, another definition is the action or fact of choosing to take up, follow, or use something. Words that are like adoption are, assumption, assuming, acquiring, or acquisition of something. (Webster, 2019).

These days' libraries and librarians have transformed from being mainly acquirers and maintainers of books for in-house use by their patrons, to that of information officers and navigators who encourage use in the vast collection of reading or information material. Librarians are busy satisfying their clients who want information anytime, in any format and anywhere. With the use of ICT Libraries provide quicker and user-oriented services (Ashikuzzaman, 2019). Since the advent of information and communication technology, dissemination of library materials has taken a different dimension. Libraries now use the internet, aided by computers to make materials available to their users. Most academic libraries spend huge sums of money to acquire electronic resources such as E-journals and E-books for their users at a click of a button.

There are different kinds of libraries which comprise academic, school, public, national, and special libraries. The role of academic libraries in any institution of higher learning cannot be undervalued. Academic libraries play a very essential role in the provision of academic resources for teaching and learning. Academic library is used to describe things that relate to the work done in schools, colleges, and universities, especially work which involves studying and reasoning rather than practical or technical skills. . Academic libraries can be defined as

libraries that are attached to institutions and they are as diverse and unique as the institutions they are established to serve providing information services to faculty members, students, researchers, and other scholarly motivated persons. Academic libraries can be grouped into university libraries and non-university libraries (Aina, 2004). Academic libraries also provide a place for students and lecturers to do research and advance knowledge in their fields of endeavours (Baada, 2018). Information and communication technology have become an integral part of our everyday lives and this include the library.

Shariful & Nazmul (2015), defined ICT as the use and application of computers, telecommunication and microelectronic, in the acquisition, storage, retrieval, transfer and dissemination of information. The term generally means all devices, networking components, applications and systems that when combined and allowed people and organizations to interact in the digital world (Natia, & Adam, 2015). According to Atiso, (2015) ICT is "intended to fulfil the function of information processing and communication by electronic means, including transmission or display, or which uses electronic processing to detect, measure, and/or record physical phenomena, or to control a physical process". Information and communications technology also refer to technologies used to handle telecommunications, broadcast media, intelligent building management systems, audio-visual processing and transmission systems, and network-based control and monitoring functions. Information and Communications Technology Tools is a general term that englobes mostly communication devices or applications including radio, television, cellular phones, computers and its networks such as the internet, satellite system and many more services associated with them (Atiso & Adkins, 2015).

According to Oludayo (2018), "ICT are relevant resources that facilitate the production, transmission and processing of information. Example of these include computer facilities (computers, scanners, printers, UPS and power point projectors), computer software resources (online databases, CD-ROMs, library application software, the internet and storage media), audio-visual media/equipment (satellite connection, digital cameras, video compact disk (VCD), digital video disk (DVD) radio, television, audio tapes, video tapes and photocopiers. Others include communication media telephone-intercom and global system of mobile tools for communication such as phones, laptops, tablets powered by the internet are playing important roles in the use of library and library services nowadays".

In recent times people prefer to use the internet in the comfort of their homes to undertake research rather than visiting a library to consult library materials. According to Adu (2009) "private universities have sprung up everywhere in Ghana". Adu (2009) further observed that, there are numerous reasons for this rapid growth in private higher education in Ghana. Firstly, Ghana's educational sector has been deregulated following a general trend of deregulation in Africa in the wake of democratization. In Ghana, the process started in 1993 when a structure for accrediting private universities was formed. Secondly, the increased growth in private institutions is as a result of the massive demand for higher education Adu (2009), added that enrolments in tertiary institutions have multiplied more than ten times over the past two decades in response to social and political pressures for access to higher education.

Most private universities fund their own operations mainly through student fees. For this reason, resourcing the libraries become very difficult and as a result, libraries cannot run as effectively as they should. This has made most private university libraries not fully functional. Many of these private universities in Ghana are owned by individuals and religious organizations. A study by

Halisu (2011) posited that the lack of organizational commitment towards ICT procurement constituted the highest obstacle towards ICT use. Consequently, university authorities do not want to spend money buying expensive (ICT) tools like computers, internet connection, or even subscribing to e-resources for the library. This has made the access and use of information and communication technology in private university libraries very difficult.

According to Alakpodia (2010), to properly harness ICT, users should possess the needed computer literacy skills, and this has been referred to as a "comfort level someone has with using computer programmes and other applications associated with computers" The question as to whether the staff in the libraries have knowledge in the use of Information and communication technology tools depends on their readiness to acquire and use ICT facilities (Alakpodia, 2010).

The library, irrespective of its kind performs various roles. Some of the roles performed by libraries include, acquiring, processing, storing and dissemination of information. Many library routines and operations that were initially performed manually are now being converted to computerized operations which means, applications of ICT techniques to providing better and faster services to the end users (Adebayo, Ahmed, & Adeniran, 2018). The focus of this study was to find out how librarians use computers aided by the internet to disseminate information and to do their daily library work such as acquisition, accessioning, cataloguing and classification and circulation of library materials. Krubu & Osawaru, (2011), have noted that "over the past few years, academic libraries have been affected by changes in information and communication technology. The rate of changes is still accelerating in this area. The introduction of various information technology (ICT) trends has led to reorganization, change in work patterns, and demand for new skills, job retraining and reclassification positions".

1.2 Statement of the Problem

The importance of information and communication technology in academic libraries cannot be over emphasized. However, there are some challenges that also come with the adaptation and use of information and communication technology in libraries. Information provision is becoming a difficult commodity for librarian to provide to their users. This is due to poor financial support to libraries by government and other stakeholders (Okeke, Urhiewhu, & Nwafor, 2015). Competence in the use of ICT by some library staff is another challenge for adoption and use of ICT tools. As noted by Qutab, Bhatti and Ullah, "the lack of awareness on the part of end-users and sometimes even librarians are also behind this low use" (Qutab, Bhatti, & Ullah, 2014).

Declining library budget is one challenge faced by most private university libraries. Unlike the traditional public universities which are mostly funded by the government and therefore receive all the necessary support from government to fund its projects including the libraries, private universities, however, are solely established by individuals and private organizations which mostly depend on tuition fees paid by students to run their activities. This makes it difficult for most private universities to fund their libraries especially with expensive investments such as procuring ICT facilities for their libraries. Boateng (2019) posits that there is the ubiquitous lack of finances for funding ill-resourced libraries in Ghana. In relation to this, Ajaegbu and Ehioghae (2014), added that, "it has become a necessity for all Nigerian libraries to adopt and harness from the good deeds ICT has brought to library service's and academic research".

There are some studies that have been done on information and communication technology and its use in the library but most of these studies were done in places like India, Pakistan, Bangladesh, and Nigeria. For instance, the ICT industry in Bangladesh has been making steady progress with

rapid growth in mobile telephone and Internet usage (Bairagi, S. A. Rajon, & Roy, 2011). A study conducted in Nigeria by Ajaegbu & Ehioghae, (2014) focused on ICT in private university libraries found out that, there is the need for private tertiary institutions to adopt the use of ICT in their library services and also to employ some user education programmes for their students at the point of enrolment. Ani, Esin, & Edem, (2005), also found out that, the major obstacle to effective adoption of ICT in tertiary institutions in Nigeria are inadequate funding and the poor supply of electricity.

So far as the researcher's review of the literature was concerned it has been observed that there is a gap in research in the knowledge on adoption and use of ICT in private university libraries in Ghana. Studies by Addy, (2015) focused on ICT in libraries and its impact on education while Osei and Adjei, (2014) looked at polytechnic librarians and their use of ICT while Mingle, (2014) also carried out a study on ICT use in polytechnic libraries in Ghana. Other studies conducted by Ankrah, Agbodza and Atuase (2019), evaluated the current usage environment of library automation in two of Ghana's older public universities libraries, University of Ghana, and University of Cape Coast. Dadzie and walt (2015), investigated the availability of strategic plans or policies for the development of digital libraries in selected universities in Ghana. This study therefore aims to contribute to filling the void on the knowledge on adoption and use of ICT in private university libraries in Ghana.

1.3 Purpose of The Study

The purpose of the study was to find out the extent to which private university libraries in Ghana were adopting and using information and communication technology in their daily tasks.

1.4 Objectives of the Study

The specific objectives of the study were:

1. To assess the level of adoption of ICT in the selected private university libraries.
2. To find out how easy it is to use ICT resources in the selected private university libraries.
3. To find out the level of management support and commitment in the use of ICT resources in the selected academic libraries.
4. To find out how skilful and knowledgeable the staff are in the use of ICT in the selected private university libraries.
5. To ascertain the usefulness and extent of usage of ICT resources in the selected private university libraries.

1.5 Theoretical Framework

According to Swanson and Chermack (2013), "theories are formulated to explain, predict, and understand occurrences and, in many cases, to challenge and extend existing knowledge, within the limits of the critical bounding assumptions". Swanson and Chermack (2013) posit that theories are designed to help explain phenomena and in many cases to also challenge and spread knowledge within the confines of critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory which explains why the research problem under study exists. According to Legris, Ingham and Collerette (2003), the model that has been able to aid the explanation and prediction of user behaviour of information technology is Technology Acceptance Model (TAM) and as such the theory that underpins this research.

The variables for this research are adoption, use, information and communication technology and academic libraries. Studies in the field of use of ICT in libraries show that, the Technology Acceptance Model (TAM) was the framework used to explain the variables. The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology.

1.5.1 Strength of the model

The Technology Acceptance Model covers all aspects that deal with technological appreciation on the path of the user. It also appeals to the perceived attitude and behaviour of the user of the technology. There is a direct relationship between the theoretical framework of the study and the objectives of the study. The theory talks about perceived usefulness of ICT and this has a direct link with the objective (1) which seeks to find out how academic libraries in private universities used ICT resources to improve efficiency in their work.

Perceived usefulness (PU) this was amorphous by (Davis Bogozzi, & Warshaw, 1989) is "the degree to which a person believes that using a particular system will enhance his or her job performance" The explanation to this was that a library's adoption of ICT and ICT tools will go a long way to enhance job satisfaction and deliver service such as student queries and dissemination of electronic information very quickly and in a timely manner. Objective three (3) which seek to find out the extent of adoption of ICT in the selected private universities also has a direct link with Perceived usefulness of a technology.

Perceived ease of use (PEOU) defined by Davis Bogozzi and Warshaw (1989), as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989).

This can also be explained that libraries use of information technology will deliver accurate information within a short period of time compared to manual searching of information which takes hours for an information to be derived. Perceived ease of use (PEOU) is also linked with objective four (4) which seeks to find out the level and skill and knowledge of the staff in ICT in the selected private universities.

As highlighted in the framework, the behavioural intention to use is determined by the attitude towards using and the perceived usefulness of technology in general. Both perceived ease of use and ease of use are affected by external variables. The perceived usefulness is also determined by the ease of use of information communication and technology. The perceived attitude serves as another attribute of information and communication technology. The perceived attitude or intention to use ICT is also linked with the objective two (2) which seek to find out whether user of ICT facilities in the selected private university libraries are aware of the ICT facilities and their level of use of the facilities.

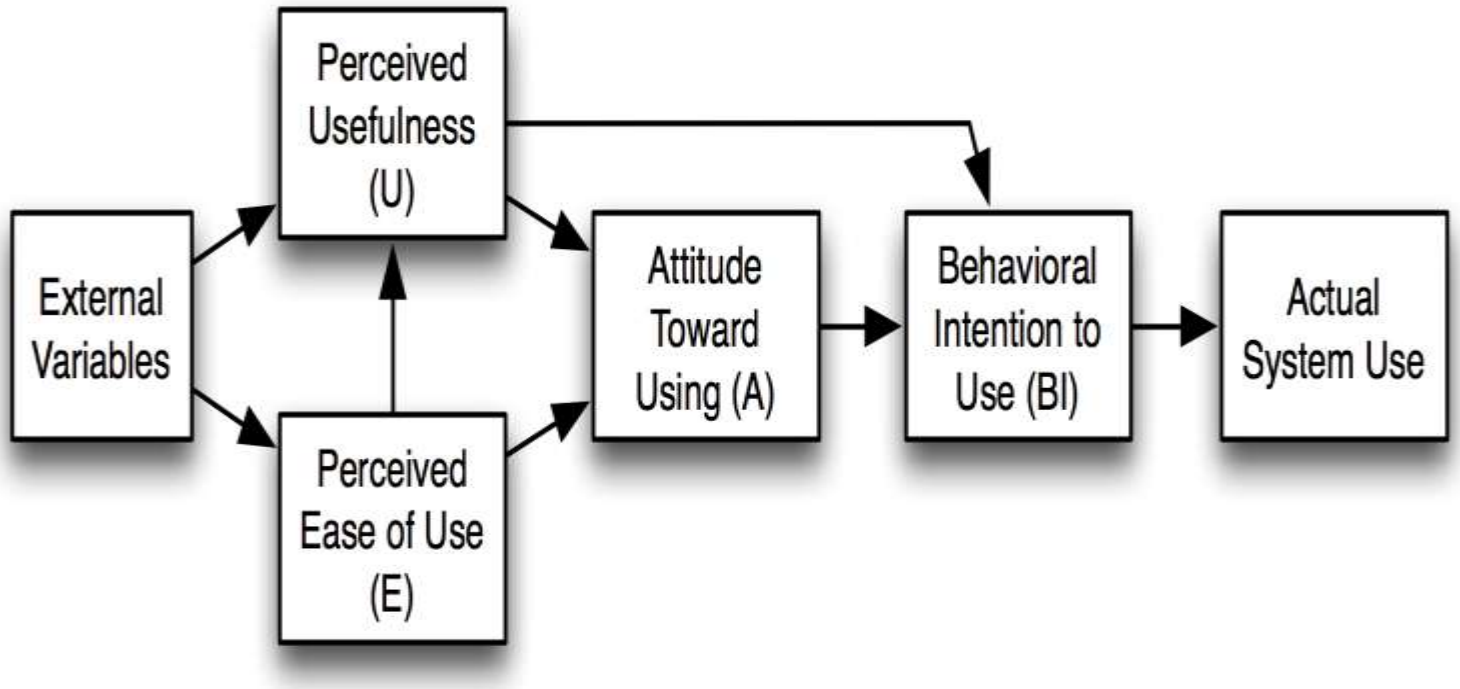

Figure 1. 1 Theoretical Framework Original Technology Acceptance Model (Davis,1989)

1.6 Scope of the Study

According to the National Accreditation Board (NAB) there are eighty-one (81) accredited private universities in Ghana. This study was limited to only three private universities in Ghana. The selected private universities were, the Wisconsin International University, the Methodist University, and Central University and its findings cannot be generalized or applied to cover the entire country. These three universities were chosen based on their characteristics of being some of the private universities offering postgraduate programmes and with well-established libraries that could help the researcher to undertake the study. Another characteristic was that they are among the oldest private universities in Ghana. This research was limited to the librarians and their assistants and graduate students offering Master of Business Administration (MBA) in the three universities.

1.7 Significance of the Study

The findings and recommendations of this research will be useful to policy makers and educational planners in fashioning out plans to include ICT in library strategies. The areas that this research does not cover will give rise to further research in developing ICT in private university libraries. Institutional leaders will benefit from the findings of the study which will guide them in achieving organizational growth.

1.8 Research Setting

This research centred around three private universities. The three private universities understudy were Central University, Wisconsin International University college and Methodist University College Ghana.

1.8.1 Wisconsin International University College

The Wisconsin International University College (WIUC) was established in January 2000 and is accredited by the National Accreditation Board as a university college and affiliated to the University of Ghana, University of Cape Coast, the Kwame Nkrumah University of Science and Technology and the University for Development Studies. It is located at Agbogba junction, in the Greater Accra Region. Its mission is to develop a world class resource, equipped with the appropriate knowledge, skills, and attitude to meet national development needs, and global challenges through quality teaching, learning and research and knowledge dissemination with key stake holders.

From a library that originally sat a little over a hundred (100) students, the new library accommodates a total of 500 reader places and is equipped with the state-of-the-art facilities in support of learning and research. The library occupies the first two floors of the total complex. The facilities in the new library complex include the following: serials collection, processing corner, discussion rooms, seminar room, postgraduate corner, and faculty corner.

1.8.2 Methodist University College

The Methodist Church decided in 1997 to establish the Methodist University College. After due preparation and processes, the Methodist University College Ghana (MUCG) was granted accreditation by the National Accreditation Board in August 2000. Its application for affiliation to the University of Ghana was approved in October 2002

The MUCG Library was established at the inception of the University College in the year 2000. The Library started with an initial collection of six thousand (6000) volumes of books and thirteen (13) serial titles. The library was then housed in one of the ground floor buildings which

now serves as part of the female hostel. The seating capacity at the time was forty (40) and the staff strength was four (4). Presently, the MUCG Library is housed in a two-story building located outside the main campus. The main library shares the same compound with the female hostel. The present staff strength is sixteen (16). The library currently holds a book collection of 34,177 volumes, 226 serial titles, 4,178 dissertations, 766 pamphlets/reports, 8 daily/weekly newspapers and 32 online databases.

1.8.3 Central University

Central University is an initiative of the International Central Gospel Church (ICGC). It has its origin in a short-term pastoral training institute which was started in October 1988 by ICGC. The college later upgraded its programmes to the baccalaureate level, and in line with national aspiration expanded its program to include an integrated and practice-oriented business school, named Central Business School.

In January 2016, the University College received its long-awaited Presidential Charter to become an autonomous and fully-fledged university, as Central University. (www.central.edu.gh)

The Central University Library was set up to provide the informational and research needs of the University community. Knowledge is said to connote power, and the mission of a library is to package this knowledge in a way that can be easily accessible to support teaching, research, give information and to entertain. Since the Vision of the University is to train transformational leaders, the Library provides accurate, current, relevant, and timely information to empower users. The Library presently has a staff strength of 20, made up of 7 professionals, 7 sub professionals and 6 others.

A higher percentage of the Library's collection is funded from the University's budget. However, the library receives donations from donors' both in Ghana and abroad. The library also has E-Journal services by its membership of the Consortium for Academic and Research Libraries in Ghana (CARLIGH), E-book Service and an Electronic Catalogue both built in-house and powered by the Destiny Library Manager's Software.

Central University currently has seven (7) libraries, stocking mostly books on programmes being run at the various campuses.

1.9 Organization of Chapters

This research report is made up of six (6) chapters.

Chapter one which is the introduction covered the background of the study, statement of problem, purpose of the study, objectives of the study, theoretical framework, scope of the study, significance of the study, research settings, and organization of chapters.

Chapter two reviews relevant literature. The literature review consisted of definition of key terms, usefulness of ICT in libraries, factors influencing the use of ICT in libraries, challenges faced in the accessibility and use of ICT in libraries.

Chapter three discusses the methodology that was used in this research. It covers the research design, selection of cases, the population, sample size, sampling technique, data collection methods, data analysis and ethical consideration.

Chapter four covers analysis of data.

Chapter five discusses the findings of the research.

Chapter six deals with the summary of findings, conclusion, and recommendations.

1.10 Chapter summary

This chapter presented the background to the study, and clearly defined the research problem. The purpose and scope of the study were also dealt with in this section of the study. The chapter further outlined the research, as well as the study setting and relevance of the study. The chapter provided a comprehensive description of the theory supporting the study while giving a justification and limitations of the technology acceptance model (TAM) as used in this study. The chapter concludes with a description of the organization of chapters in the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter comprises the review of studies carried out by different writers and researchers in the topic area. The literature review gives a clarification of the hypothetical reason of the issues being discussed and what study has as of now been done, and how the discoveries identify with the current issue. The literature review accomplishes several purposes. It shares with the reader the result of other studies that are closely related to the one being undertaken. It relates the study to the larger ongoing dialogue in the literature, filling in gaps and extending prior studies (Creswell, 2011). The main purpose of a literature review is to help develop a good understanding and insight into relevant previous research and the trends that have emerged to help you to refine further your research questions and objectives.

Mark, Lewis & Thornhill (2007) also highlighted the purpose of literature review as, to highlight research possibilities that have been overlooked implicitly in research to date. to discover explicit recommendations for further research. to help you to avoid simply repeating work that has been done already and to sample current opinions in newspapers, professional and trade journals, thereby gaining insights into the aspects of your research question(s) and objectives that are considered newsworthy.

This research reviewed literature related to the topic and drew on issues which were related to adoption of information and communication technology in the private academic libraries. The review was carried out from the world, African and narrowed down to the Ghanaian perspective. The review was carried out under the following subheadings: Development of information communication and technology in libraries. Information and communication technology in

Ghana's educational system; Usefulness of information communication technology in academic libraries; The Importance of User Education in effective library use; the impact of ICT adoption in effective library service; Factors Hindering the use of ICT in academic libraries; and Challenges in the accessibility and ease of use of ICT in libraries.

2.2 Development of Information Communication and Technology in Libraries

There are many libraries in the world. They are of different kinds in terms of the institutions within which they are located, the clientele that they serve, the resources that they command, their aims and objectives, their size, and the sociotechnical complexity and their organizational arrangement (Rayward, 2002).

Historically, only kings and preferably nobles in the communities were privileged to have access to libraries. Thus, the library was restricted and not opened to just anyone in the community. However, libraries today have become part of human development and so are opened to anyone who wishes to be informed. According to Shukla, & Sialai (2018), "the development of ICT started In the 1930s, with Herman Hollerith's invention of the punch card technology". The authors noted that, in 1950, the Library of Congress introduced a book catalogue using Punch Cards. In the 1960s, the first library automation was developed in the U.S. In the 1970s, integrated chips and storage devices were also developed, and Research Libraries Information Networks (RLIN) and Wireless Local Networks (WLN) started the online library networks. The authors added that, in the 1980s, the use of computers in libraries increased greatly. Many library automation packages came into the market and in the late 1980s; Compact Disk Read Only Memories (CD-ROMs) that contained databases, information and software were also introduced.

Ashikuzzaman (2018) opined that, the term "information technology" evolved in the 1970s. Its basic concept, however, can be traced to the World War II alliance of the military and industry in the development of electronics, computers, and information theory. After the 1940s, the military remained the major source of research and development funding for the expansion of automation to replace manpower with machine power. The author further noted that, Developments in artificial intelligence that minimized the need for complex programming describe the fifth generation of computers (Ashikuzzaman 2018).

"The term Information and communication technology had been used by academics since the 1950s. Information and communication technology has prompted traditional libraries to transform into digital libraries". Rayward (2002), argued that the history of computerization in US libraries is intelligible only against a background of the professionalization of librarianship during the latter part of the 19th and early part of the 20th centuries. The author is of the view that, professionalization was intimately bound up with the creation and maintenance of a range of technologies that were specific to libraries. Long before the advent of computers, he suggested that the sophisticated and evolving technologies that the modern library deployed were highly adapted to its needs and purposes. The International Federation of Library Association (IFLA) (2004) noted that, librarians in 1963 did not yet have many of the automation options that are commonplace now. Integrated circuits, chips, networks, even floppy discs were still a few years away. The cathode ray tube was invented but not yet deployed. The personal computer would not debut for 17 more years and the first MARC Pilot Program at the Library of Congress would not start until the following year. McCallum, (2004) noted that, "libraries have changed from close-access libraries of earlier times to the present-day virtual libraries. In the last few years, the Internet, the

Web, computer languages, and tools have developed rapidly increasing the number of digital resources that needed to be controlled, served, and preserved by libraries".

Parvez, (2009) asserted that, with the advent and development of ICT, academic libraries have shifted from the traditional to hybrid library, then automated library, digital archives stages, library 2.0 and mobile phone service. Rayward, (2002), opposed the view of Pervez and argued that, as a result of break down under economic, social, and bibliographical pressures emerging in the late 1950s and early 1960s and librarians began seeking relief in automation, the introduction of automation involved profound misunderstandings between librarians and early systems developers about the nature of the professional knowledge and traditions of librarianship on the one hand and of the capabilities of the new technology and what was required for its implementation on the other.

Ashikuzzaman, (2018) also researched on the role of librarians in the development of ICT and noted that, librarians have been changed from simple storekeepers who were concerned with the protection of books against theft and mutilation, to that of information officers and navigators who encourage the use of information in the vast array of information material.

Information and communication technology has changed the library and information services globally. Digital media has transformed the information society and improvements in ICT has changed information provision. The internet has provided universal access to information. ICT innovation has changed the rate of conversion of knowledge, information, and data into electronic or digital format. Ashikuzzaman, (2018), further noted that improvement in software has produced powerful knowledge management software which has transformed the way knowledge is

organized, stored, accessed, and retrieved. Basically, digital revolution driven by ICT's innovation has transformed university libraries. It has impacted on every sphere of university library activity. The earlier role of university libraries as information custodian has been reduced to that of being one of many information providers.

2.2.1 The evolution of computers in libraries

The history of computers goes back to several decades, however, there are five defined generations of computers. Ashikuzzaman, (2018), noted that, "since the 1950s, four generations of computers have evolved. Each generation reflected a change to hardware of decreased size but increased capabilities to control computer operations. The first generation used vacuum tubes, the second used transistors, the third used integrated circuits, and the fourth used integrated circuits on a single computer chip".

The fifth generation is the artificial intelligence. Computer devices with artificial intelligence are still in development, but some of these technologies are beginning to emerge and be used as voice recognition.

Computer is an old word that has changed its meaning several times in the last few hundred years. Rojas, (2000), wrote about the early classifications of computers in to five main categories. The flesh and people who compute, the wood device such as abacus, the metal, such as early machines of pascal. The electromechanical device such as early machines of Zuse and electronic element such as ENIAC and stored program computers. Noted that, computers can be classified in to three stages. Steitz, (2006) supported the submission by Rojas (2000) observed that, the first generation started in 1937-1946. It was called the Atanasoff Berry Computers (ABC), colossus for the military and Electronic Numerical Integrator and Computer (ENIAC). The second generation of computers

used transistors as a substitute to vacuum tubes which were more dependable. According to Steitz (2006), during the second generation, storage media such as tapes, disk and printers for output were developed. Steitz (2006) went further to state that the creation of integrated circuits brought us to the third generation of computers. He added that with this development, computers became smaller and sophisticated, and more reliable and can run many different programmes at the same time.

According to Hogenbirk, (2019), In the 1990s, the Internet exploded as a source of information. Windows fetched a much more attractive design for the software's. Computers appeared and replaced manual work done in the classroom, and at the teacher's desk. Projectors could be used for demonstration purposes. Administrative software was developed and replaced written reports. Assessment tools became available, electronic calculators changed the mathematics syllabus, and word processors replaced spelling. IT became ICT! It was not any longer only about the rather static use of data and information, but the digital revolution also changed the way of communicating.

2.3 Implementation of ICT in Ghana's educational system

The Government of Ghana has placed strong emphasis on the role of ICT in contributing to the country's economy. The country's medium-term development plan captured in the Ghana Poverty Reduction Strategy paper (GPRS I&II) and the education strategy plan 2003-2015 all past strategies that suggested the use of ICT as a means for reaching out to the poor in Ghana Mangesi, (2007). Peprah, (2016) stated that, ICT offers teacher and students both technological tools and recourses which are beyond the boundary of their classroom. Therefore, when the GPRS policy is properly implemented, it could support and transform the learning situation in every country.

However, the best intentions might not always achieve the reality as projects on making ICT education accessible mostly fail to achieve its objectives.

According to Natia, & Seidu (2015), on the national level several initiatives have also highlighted the importance of ICTs in achieving education sector goals. The Government of Ghana has committed to pursuing an ICT for Accelerated Development (ICT4AD) Policy (2003). This national policy outlines the plans and strategies for the development of Ghana's information society and seeks to provide a framework and plan as to how ICTs can be used to facilitate amongst other objectives the national goal of "transforming Ghana into an information and knowledge-driven ICT literate nation".

According to Martey, (2004) in 2004, the parliament of Ghana passed into law Ghana's ICT for accelerated development (ICT4AD) policy (Ministry of Education, 2003). This policy represents the vision of Ghana in the information age. The ICT in education policy for Ghana, had a long gestation period. A committee set up by the Ministry of Education, Youth and Sports outlined an ICT in Education Framework and produced a document that remained untouched for a long time.

The objective of the document was to ensure that students have ICT literacy skills before coming out of each level of education. Provide guidelines for integrating ICT tools in all levels of education. Provide means of standardizing ICT resources for all schools. Facilitate training of teachers and students in ICT. Determine the type and level of ICT needed by schools for teaching and administration purposes. Promote ICT as a learning tool in the school curriculum at all levels

The above objectives showed the extent to which ICT is important to the development agenda of the Government of Ghana. According to the ministry of education document, In 1995, Ghana

signed an agreement with Microsoft Corporation, under which the largest and richest ICT company in the world will provide resources to improve ICT education in Ghana. It is important to note that, Ghana in 1995 became the first country in Sub Saharan Africa to have full internet connectivity (Opoku, 2004). Rivers, Rivers, & Hazell, (2015) indicated four salient components related to incorporating ICTs into higher education. They are teacher education; curriculum development; distance learning; and educational policy, planning and management.

2.3.1 Implementation of ICT In Basic Education

Natia & Seidu , (2015) noted that, in the last decade, the Government of Ghana has championed the use of ICT in education for improved educational outcomes. The Education Strategic Plan (2003-2015) and (2010-2020) of the Ghana Education Service identified the need for ICT in education to help achieve the objectives of the Education Strategic Plan. It explicitly outlined the plans and strategies in a framework of how ICTs can be used to facilitate the national goal of "transforming Ghana into an information and knowledge-driven ICT literate nation. The authors added that, based on promoting ICT in education, the Ministry of Education launched the ICT in Education Policy in 2008 as a way of addressing the ICT needs in education. Similarly, the basic school computerization policy was created in 2011 to introduce computers and e-learning into the entire education system. Hence, in 2012, the Ministry of Education through RLG, an ICT company in Ghana introduced the "teacher laptop and ICT project" where teachers are trained in ICT and provided with laptops to aid in research, teaching and learning across a variety of subject areas. Mingaine (2013), conducted a study on the use of ICT in the Junior High School level and supported the view that, Ghana is committed to transforming teaching and learning at all levels of education through the introduction of information and communication technologies.

According to Acquah (2012) a classic example of change in the educational sector in Ghana is the 2007 educational reform which has contributed to the efficient infusion of ICT that permeates all levels of education, and even at the basic school level. This move towards ICT education, even at the grass root level has been spurred on directly by several factors, one of which is the Ghana Government's ICT policy. Mangesi (2007) supported this view and added that, in the basic and secondary education sector, a project to set up computer laboratories in all science schools in the country has led to a significant number of computers being installed across the country. Studies suggests that the relevance of the study of ICT in school, especially at the lower levels of education, cannot be over emphasized. For example, the teaching of ICT at the primary school level prepares pupils to face future development based on proper understanding of issues.

Notwithstanding Hogenbirk, (2019) refuted the argument that ICT is very important in the curriculum of education and asserted that the "usage of ICT in daily life indeed became "normal" and inevitable. Nevertheless, schools are still wrestling with questions about the necessity, usability, effectiveness, and the reliability of using ICT in the educational process, and thus we still see a lot of schooling activities where ICT does not play any role at all". Grimus (2000) posited that, ICT makes education accessible anywhere, anytime, and anyhow. ICT has potential to make educational resources accessible and improving quality knowledge sharing and management of the education system entirely.

2.3.2 Implementation of ICT in Secondary Education

According to Mingaine, (2013), "ICT has changed the way teaching and learning is carried out in schools. With emerging uses of ICT in school, teaching could be changed from emphasis from teacher centered to student centered, hence creating thought-provoking and interactive learning

environment". The author revealed that, most teachers are not keen on adapting and using ICT tools during teaching and learning. It appears that teachers' skills and attitudes towards ICT remain a challenge for the adoption and use resourcefully the technology in classroom.

Buabeng-Andoh & Issifu (2015) opined that, to meet the challenges of education in the 21st, century the Ministry of Education (MoE 2008), formulated a draft policy titled: "ICT in Education Policy", policy framework describing how ICTs should be introduced and implemented in second-cycle institutions. The policy proposed the introduction of ICT as a core subject, the introduction of ICT as an elective subject, the integration of ICTs as a teaching tool for all subject areas and the integration of ICTs to support educational management and administrative functions (Buabeng-Andoh & Issifu, 2015).

According to Buabeng-Andoh, (2019), many governments have developed plans and spent millions of dollars dealing with ICT in education. Despite all these investments, ICT has not been significantly integrated into teaching and learning activities in secondary schools. Zaman et al (2011) as cited in Mingaine, (2013) looked at the benefits of integrating ICT in education and stated that, in The effective implementation of ICT in schools is a multi-layered, complex process that just not involves providing the technology to schools but also involves teachers' competencies, schools readiness, long term financing and curriculum reorganization. Secondary school students need a basic understanding of the concept of ICT before entering university where expectations to be independent in using information is high. Additionally, if lifelong learning capabilities are to be inculcated into students, educational institutions at the secondary level must integrate IL into their curriculum (Onyebuchi & Ngwuchukwu, 2013).

Hogenbirk, (2019) indicated that ICT should be regarded as a subject in the curricular, learning about informatics, computer science and information literacy. The author further noted that in

Secondary Education Digital Literacy (SEDL), computer literacy has been replaced by information literacy, media literacy, or digital literacy. This area consists of a series of communication capabilities, including the ability to access, analyze, evaluate, and communicate information in a variety of forms, print and nonprint including messages and also moral and ethical issues concerning the use of social media and the Internet. Malero, (2013) in his research which looked at the use of ICT by private and public secondary schools also revealed that despite the advantages associated with the use of ICT in secondary schools, the ICT has also created a disproportion between the two groups in different parts of the world with private schools being more favored than public schools in the use of ICT.

The findings reveal that majority of the public schoolteachers accounted that their schools did not have enough ICT structures and they did not have the required skills to harness the power of ICT in content delivery. On the other hand, the private school teachers were more motivated and enjoy support from their schools towards ICT usage (Malero, 2013).

2.3.3 Implementation of ICT in Tertiary Education

According to Mangesi (2007), the Ghanaian tertiary education sector is the most advanced in the deployment and use of ICTs in the country. All the country's major universities have their own ICT policies, which include an ICT levy for students. This enables students to have access to computer labs with broadband connections. However not all tertiary institutions in the country are endowed and there are instances where the computer facilities are run purely by the private sector as cyber cafés on campuses.

Delić-Zimić & Gadžo, (2018) are of the view that prioritization of ICT for funding and making ICT a priority project in the universities is also important, where ICT should even be recognized as a necessary utility such as water and electricity in the development of the university. Priority is

required for human resources development for sustainability as well as organizational, structural, and financial sustainability. Integration of technology into the new learning and research paradigm whilst staff and students are trained for this new academic environment is important. However, the successful introduction of ICT into basic education depends largely on the availability of ICT infrastructure and the capacity of teachers and students to use them.

Fleischer (2015) also researched into ICT in Junior High School and Senior High Schools in Ghana. He noted that information communication technology usage is a global phenomenon and has caught up with users in the African continent. In view of this, Ghana as a country in realizing the importance of ICT in the lives of its citizens as a potential in augmenting development rolled out a policy for the use of ICT. This policy has seen the study of ICT as a subject in both the basic and second cycle levels of the educational institution. The study by Fleischer (2015) further noted that, the use of ICT in secondary schools opined that, the introduction of information and communication technology in senior high schools has been recognized as a medium of revolutionizing the teaching and learning process. This thought has led to the introduction of computers and internet access in some Senior High Schools in Ghana.

Achimugu, Oluwagbemi, & Oluwaranti,(2010) identified three benefits of implementing ICT in education. The researchers outlined that, ICT can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events. The second benefit is that ICT can facilitate the acquisition of basic skills amongst people and be used to improve access to and the quality of teacher training. There should be an assessment of ICT which considers, all areas of an institution including teaching, research, administration and management, curricular development and library and

archival services. In addition, ICT integration should transform students work environment after graduation (Delić-Zimić & Gadžo, 2018). Fosu & Kyere-djan, (2013) asserted that, while equipping institutions with ICT infrastructure and using ICT to augment teaching, research and learning is useful, the goal of fully integrating ICT in educational, research and administrative process seem very slow.

2.4. ICT and distance Education in Ghana

The Ministry of Education, outlined the purpose of introducing ICT in to the Ghanaian educational system, especially in distance education. The Ministry of Education acknowledged that for Ghana to make any appreciable progress in its socio-economic development efforts, substantial resources will need to be directed at improving educational delivery. According to the ministry, the key role that information and communication technologies can play in widening access to education to a wider section of the population and literacy education for facilitating educational delivery and training at all levels has been recognized as a key priority area under the current Education Reforms. The efforts to introduce ICTs into the sector by the Ministry and its development partners and other private sector agencies cover over ten (10) years. Initiatives have spanned pre-tertiary both public and private schools and tertiary. Efforts have largely been geared towards the deployment of ICTs to these facilities via the provision of computers and the establishment of ICT laboratories (Ministry of education 2008).

Waycott, et al (2010) asserted that, distance education programmes are becoming relevant in contemporary time as the 'hub' for the development of knowledge in the world. Efforts seem to be strengthened in many countries, in embracing a coherent approach to distance education for the large number of people who have difficulties in attending conventional tertiary institutions. This

is because of their busy schedule at workplaces and family commitment. Mensah & Owusu-Mensah , (2002) supported this view and added that, distance education has the following advantages: Providing opportunity for a large number of qualified applicants, who do not get admission into the main university system as a result of limited facilities, to have access to tertiary education and in addition, providing opportunity for working adults to combine work and study and creating an avenue for income generation by the universities.

Osei & Mintah (2014), outlined the effectiveness of ICT in education and opined that, the new process of education delivery has established new developments in information and communication technologies by the government of Ghana also identified areas that ICT can be effective in education and noted that, effectively used, ICTs can amongst other things: provide multiple avenues for professional development of both pre-service and in-service teachers, especially through distance education. Facilitate improved teaching and learning processes. Improve teacher knowledge, skills, and attitudes and inquiry. Improve educational management processes. Improve the consistency and quality of instruction both for formal and non-formal education. Increase opportunities for more student-centred educational approaches. Promote inclusive education by addressing inequalities in gender, language, disability. Widen the traditional sources of information and knowledge. Reach student populations outside traditional education systems (Ministry of Education, 2008)

Osei & Mintah , (2014), further stated that, "upon the recommendations from a survey, the public universities agreed to start distance education programmes. The four universities, University of Ghana (UG), University of Cape Coast (UCC), Kwame Nkrumah University of Science and Technology (KNUST) and University of Education, Winneba (UEW) started preparations for this

new model of educational delivery. University of Ghana chose to offer four courses through its DE programme. These are Sociology, English, Religious and Political Science at the bachelor's degree level. For University of Cape Coast, the courses selected were Bachelor of Education in Primary Education and Post Graduate Diploma in Education (PGDE). At the University of Science and Technology two programmes were proposed for the program. These were BSc (Building Technology) and BSc (Biological Sciences)".

According to a research by Delić-Zimić & Gadžo, (2018), ICT will have a deep impact on teaching and learning including influencing the way tertiary education institutions carry out their functions of teaching, learning and research, particularly on the creation, dissemination, and application of knowledge. These developments pose an unparalleled challenge to tertiary institutions. This massive increase in access to education needs to be matched by equal increase in library funding, ICT infrastructure, resources and services at locations other than main campuses; an increased concern and demand for Computer Science and Information Technology; equitable service for all students in higher education, no matter where the classroom may be and a greater demand for library (Awuor, Rabah & Maake 2016).

2.4.1 Utilization ICT in Teaching

Studies show that all over the world, different countries have consistently initiated programs that are directed at making teachers adopt and use ICT in their everyday teaching and learning practices in schools. According to (Jimoyiannis, & Komis, 2007 as cited in Mingaine,2013), countries like UK, Singapore, China, Australia, and the European Union (EU), etc. have established programs that aim at enhancing teachers' skill important to adapting and using ICT during teaching and learning processes.

Many researchers consider designing and integrating efficient ICT teacher preparation programmes as a key aspect to essential and successful, wide-ranging school reforms. Martey (2004) noted that, tremendous improvement is seen in schools where ICTs exist, several teachers use the Internet for research. Smart boards and projectors are also available in such schools.

2.4.2 Utilization of ICT in learning

Most universities that have fully adopted ICT have recorded immense advancement in the application of ICT for the improvement of learning methods, teaching, research, and development. It is, however, not clear what impact the ICT applications have on the performance and achievement of students (Basri, Alandejani, & Almadani, 2018). Atiso (2007) as cited in Atiso & Adkins, (2015) , surveyed students on their use of ICTs for academic work and found that Internet resources were used as a supplement to classroom notes.

2.5 Usefulness of ICT in Academic Libraries

Basically, information and communication technology enhance the workflow of the library which helps in reducing manual work. This proliferates library services. One of the most prominent advantages of ICT is to provide ICT-based information services to meet the users' demands. According to Woodward (2009), tremendous development has been seen in the field of library and information science due to the faster growth in technology. In past few decades, with the use of internet and technology, the library work has become very fast. To satisfy the needs of library users, speed and accuracy is the most two important dimensions.

Osawaru & Krubu, (2010) were of the view that, the effect of information technologies is felt by libraries in every facet. Computing, communication, and mass storage technologies are some of the areas of continuous development that redesign the way that libraries access, retrieve, store,

manipulate and disseminate information to user. The authors further noted that, ICT presents an opportunity to provide value-added information services and access to a wide variety of digital based information resources to their clients. Furthermore, academic libraries are also using modern ICTs to automate their core functions, implement efficient and effective library cooperation and resource sharing networks.

Due to information explosion, it is very difficult to handle large information with traditional library tools like manual catalogue, bibliographies, etc. In today's library environment, to provide the right way, is not possible without ICT application (Khan 2016). Osawaru & Krubu, (2010) supported Khan's view and added that, ICT has brought unprecedented changes and transformation to academic libraries and information services. Conventional library and information services such as OPAC, user services, reference services, bibliographic services, current awareness services, Document delivery, interlibrary loan, audio visual services and customer relations can be provided more efficiently and effectively using ICT, as they offer convenient time, place, cost effectiveness, faster and most-up-to-date dissemination and end users involvement in the library and information services process.

ICT has become a necessity and is needed in today's libraries. In this direction strenuous work such as classification and cataloguing which were done manually have now been made easy with the introduction of information technology. Librarians now can-do copy cataloguing which is readily available on Library of congress classification system. This has made cataloguing and classification of books uniform in most academic libraries. Khan (2016), asserted that, ICT has changed the way of acquisition, technical processing, periodical subscription, and circulation activities, in such a way that library readers can get required information and services effectively in shortest time with less manpower involvement.

If libraries are to function well in the present age the manual process will have to give way to the Information and Communication Technologies and a computer driven environment. (Adekele and Olorunsola, 2010). Jaliyang, (2016) supported the view of Adekele and Olorunsola, 2010 and added that, using ICT in academic libraries are also playing a very important role in facilitating access to global information and knowledge resources in an academic environment. Libraries act as facilitators to provide right information to the user at the right time.

2.5.1Usefulness of ICT in various library operations.

Akidi, & Okezie, (2018) noted that, globally, application of ICT to library functions and services results in improved services, saves the time of the staff and users, thus, librarians are manipulating ICT to meet the varied needs of their users. Saleem, Tabusum, & Sadik Batcha, (2013) observed that, now a days there are several information communication technologies for various housekeeping, management, and administrative functions of the library. Different electronic and digital media, computer aided electronic equipment's, networks and internet has provided significant role in retrieval and dissemination of information and playing an important role for modernization of libraries.

2.5.2 Cataloguing and classification

Application of information resources involves identification of the bibliographic features of an information resource, identification of the appropriate subject headings, assignment of appropriate call marks, preparation of catalogue entries, production of catalogue cards and library catalogue maintenance, among others. cataloguing and classification are one of the bibliographic control practices. Thus, application of information and communication technology to this practice brings about effectiveness and ultimately ensure that the bibliographic agency achieves the purpose of bibliographic control, which among others, involve easy accessibility and availability of

information resources globally. (Akidi, & Okezie, 2018) noted that, the computer ca be used to duplicate cataloguing cards, prepare authority file/subject headings list, for sorting, checking, and filing of catalogue cards, automatic generation of added entries, generating the monthly accession lists, and developing centralized and cooperative cataloguing system.

2.5.3 Library management

Classification, cataloguing, indexing, database creation, are affected by the ICT. Library Management includes activities which will certainly be geared up using these fast ICT developments. There include Classification, Cataloging, Indexing, Database creation, and Database Indexing.

2.5.4 Circulation

Registration of members, Charging and discharging of documents, Updating the records file, Preparation of reminders, Maintaining statistics, Information retrieval etc.

2.5.6 Acquisition

The computer can be used to check duplicate collections, preparation of order lists, sending orders to book supplier(s) through mails, monitoring orders oversees and follow up action, verifying order file and invoices, and budget control.

2.5.7 Barcode technology

Barcode technology can be defined as a self-contained message with information encoded in a series of black bars of varying breadths and white spaces between every two of them. These are helpful in terms of circulation work and stack verification work of library documents. (Shukla, Akhandanand & Sialai, 2018)

2.6 The Impact of User Education in Library

Educating users in information technology will greatly reduce their over dependence on librarians to assist them in getting information. Suleiman, (2012) observed that, the library supports the reading and research needs of its user for that institution. It is the library's responsibility to provide better services to its clients to make sure that information sources, services and resources are well utilized for users' benefits. Hence user education programs are very crucial for library user's achievements.

Even though secondary school students are expected to be independent information users at the time of graduation Majid, Chang, & Foo, (2016), observed that, this is probably not the case in Ghana, as Information Literacy (IL) is not integrated into the secondary school curriculum as it pertains in some countries (Majid, Chang, & Foo, 2016). Furthermore, a few public and private universities in Ghana have commenced teaching information literacy to their first-year students. Secondary school students need a basic understanding of this concept before entering university where expectations to be independent in using information is high. Additionally, if lifelong learning capabilities are to be inculcated into students, educational institutions at the pre-university level must integrate IL into their curriculum (Onyebuchi & Ngwuchukwu, 2013).

To this end, it is appropriate to find out the extent to which information literacy skills of secondary school students in Ghana are comparable to their counterparts in countries where IL has been integrated into the educational curriculum. Furthermore, most of the existing studies pointed to students' weak evaluation skills as a result of over-concentration on lower-order IL outcomes. (Yeboah Owusu-Ansah. Christopher, M.& Dadzie, 2017).

As digital resources increased over the last decade, academic libraries have heavily invested in electronic books, research databases, as well as electronic journals, and made them accessible via

their library Web portals. Some libraries also assume usability initiatives to improve their Web portals in order to provide users with better and easier access to their electronic collections and services (Chen, 2012). Many library users require the knowledge of ICT. To meet this challenge, librarians can help make ICT awareness available by creating electronic learning centers within the libraries. Such creation will go a long way to help users who are handicapped in the use of ICT (Afolabi, Abidoye, & Afolabi 2013).

Chen & Lin (2011) asserted that, information literacy programs benefit the library and its staff, faculty, and students. librarians should play leading roles in the design and operation of programs, but added that collaboration with faculty, information technology professionals and students is very important. They added that, emphasis should be placed on first year students. This will turn the librarians into instructors and the library will become a learning center, combining learning, research, and technology.

According to Befus & Byrne, (2011), information professionals have seen a change in student behaviors both at the reference desk and in instruction sessions. The ICT has boosted student's confidence level in their research capabilities, increasing the demand for information literacy. Students are now used to online learning, not only because of the shift in higher education to online coursework, but also because they have been learning online at home through YouTube, social media, and other websites. Libraries around the world have met the challenge by creating online information literacy tutorials, but due to the ever-changing nature of the internet, these tutorials must be periodically updated.

2.7 The Role of ICT in Academic libraries

Information and communication technology (ICT) application to library work and services could be the best way that could be used to assist researchers to adequately solve their literature need for effective research activities. Ashikuzzaman (2018) opined that "as the world is growing technologically, library procedures in various locations globally are no longer how they used to be". This is because the application of ICT to library operations greatly helps in the provision of efficient reference and information services, the utilization of network operations such as cataloguing, authority control, inter library loans and cooperation and in the participation of international bibliographic project.

Afolabi & Abidoye, (2017), posited that, with the proliferation of information, information is scattered in many areas and to keep track of these information many libraries have started embracing the recent developments in information technology to help them for effective library services. Library is a place where knowledge is created and shared. The authors added that, it is a place where knowledge in various formats, be it print or electronic is preserved. There are different kinds of libraries which include academic, school, public, national, and special library. Planning for the effective use of these technologies is crucial if they are to have the positive impact expected.

Investing in ICTs is a costly decision for any country, whether developed or developing. For developing countries such as Ghana, investing in ICTs presents the dilemma of spending scarce valuable resources on ICTs or consequently suffering from widening technological divide (MoE, 2008).

According to Adebayo, Ahmed, & Adeniran, (2018), adoption of ICT in libraries is a way of improving on information services provided in libraries. This is a period, when people need to access timely information with ease, and this can only be done through the application of ICT to

library services. Krubu & Osawaru, (2011) were of the view that, over the past twenty-seven years, academic libraries have been affected by changes in information and communication technology. The rate of changes is still accelerating in this area. The introduction of various information technology (ICT) trends has led to reorganization of libraries, change in library work patterns, and demand for new skills, such as ICT skills and job retraining and reclassification positions. Krubu and Osawaru (2011) further noted that, ICT has impacted on every sphere of academic library activity especially in the form of the library collection development strategies, library building and consortia. ICT presents an opportunity to provide value-added information services and access to a wide variety of digital based information resources to their users. This means that one does not have to limit his or her search to only local library materials. The influx and proliferation of electronic resources and digital libraries have already influenced the way users use print resources and traditional libraries (Ashikuzzaman 2018).

Atiso & Adkins, (2015) observed that, the library and the information profession is experiencing a drastic transformation whereby materials available only in print format are now also available in electronic format. Services which were manually done can be done electronically with greater ease and greater capacity for shared labour. The authors noted that, ICTs have been instrumental in research and development, especially for international research networks as evidenced in the various national and international research collaborations.

2.8 Factors Hindering the use of ICT in libraries

The fact that ICT has brought tremendous change in the way we work and live, not to mention the benefits we derive from it, however there are also challenges associated with the use of ICT in our daily lives and the library also have its associated challenges with ICT such as cost of acquiring ICT tool, inadequate power supply, lack of ICT knowledge by users and lack of funding. Indeed,

information technology (IT) is a driving force for change in libraries and modern technologies have brought dramatic changes in today's library management and users' expectations. Libraries are facing variety of issues, problems, threats, and challenges in the introduction, use and management of new technologies. This implies that identifying the problems, understanding the issues and formulation of sound strategies are key to the successful management of technological changes in libraries (Pembee, 2004)

According to Awuor, Rabah & Maake (2016), factors that hinder the dissemination of ICT in university libraries are: Political and economic instability in developing countries. This have negatively impacted the operations of academic libraries with external funding agencies taking advantage of this instability to push for their own agenda and priorities. The authors also went further to argue that, rapid growth of student populations has provided enormous challenges to most universities since the financial support for these institutions does not march with increasing levels of student's enrolment and growth. Without adequate support from the government and, in some cases, the inability to charge tuition fee, universities are struggling to provide the necessary and essential services. The authors also identified complete lack of exposure of library staff to international standards and best practices as one of the factors that hinders the use of ICT in Academic libraries. Experience is also a hindrance factor to adoption of ICT in academic libraries. Most librarians have never had the opportunities to attend conferences outside the country and, therefore, have limited access to cutting-edge knowledge such that the library staffs are unaware of the existence of international standards.

Jain, & Meeran, (2002) supported Awuor, Rabah & Maake's (2016), assertion and opined that, even though all library professionals are well qualified, a basic knowledge of ICT applications is essential to provide services in the present-day environment. According to Haliso (2011) Ghana's

academic libraries enjoyed the availability and use of information and communication technology through the DANIDA sponsored project under the sponsorships of the International Federation of Library Association-Africa branch. Six universities were networked under this project and this made communication very easy and document delivery possible among the academic librarians in the six university libraries. However, the researcher made a visit between Feb 26, 2005 and March 7 to the University of Ghana in Legon to find out the progress of the DANIDA project but sad to report that the project could no more continue due to lack of funds.

Haliso, (2011), further observed that, information and communication technologies enhance service provision to library clientele. Librarians use ICTs to perform functions like cataloguing and classification, serials management, collection management, budgeting, circulation management, referencing, indexing, and abstracting to improve information services to library users. However, it has been observed that most academic librarians in Nigeria still struggle with manual library operation method. Consequently, library users show dissatisfaction and complain of poor information services delivery by the academic librarians.

Martey, (2004) stated some of the problems affecting use of ICT as inadequate and unevenly distributed access throughout Ghana, with an urban bias. The capacity of teachers and educators to deliver policy remains low with many opposed to adopting ICTs in the classroom or with inadequate skills. There is a lack of adequate collaboration between the Ministry of Education and Ghana Education service or other implementation agencies such as ministries, departments, and agencies to provide ICT infrastructure.

Problems that hinder the effective use of ICT in academic libraries are, the lack of sufficient funds, lack of support from authorities, lack of initiative on the part of library staff was cited by a librarian as another problem for ICT application (Jeliyang, 2016). Lack of affordable and dependable

connectivity with efficient bandwidth. the unwillingness to use ICT coupled with unreliable electricity complicates the matter of ICT adoption in academic libraries (Fosu & Kyere-djan, 2013).

Baro and Asaba (2010) observed that, lack of fund, absence of technical staff to maintain the networks, and lack of maintenance culture are some of the factors hindering internet connectivity. Another serious challenge to the library and information profession in Ghana is that of image. According to Atiso & Adkins, (2015), an industry with a low societal image in society has many problems, including the inability to attract highly qualified new applicants, poor remuneration and high abrasion rate. As a result of low image fundraising becomes more difficult thereby making libraries ultimately remain dependent on central government for funding, which is almost always inadequate. Analysts have suggested that the availability of ICTs may help Ghanaian libraries perform at a higher capacity.

2.9 Impact of adoption of ICT in effective library use

According to Ashikuzzman (2018), the impact of ICT on every sphere of academic library activity in the form of the library collection development strategies, library building and consortia. "ICT presents an opportunity to provide additional information services and access to a wide variety of digital based information resources to their clients". Furthermore, academic libraries are also using modern ICTs to mechanize their core functions and implement efficient and effective library resource sharing networks and implement management information systems.

"Owing to ICT enabled products & services, libraries have changed the way they operate, in terms of the provision of information services. These products and services are the integration of computer and communication technologies, which can be applied to store and disseminate the

information. Libraries and information centers have embraced ICT more profoundly than many other fields, and most of them are currently using electronic products and services" (Hussain,2015).

Chisenga, (2006) supported the views of Hussain and opined that, ICT present an opportunity to provide value-added information services and access to a wide range of digital-based information resources to clients. The author Again added that, libraries are also using modern ICT to automate their core functions, implement efficient and effective library cooperation and resource sharing networks, implement management information systems, develop institutional repositories of digital local content, and digital libraries; and initiate ICT based capacity building programmes for library staff and information literacy programmes for library users.

Khan (2016) posited that, traditional libraries are changing their role and functions according to the new trends in the society. The library is providing information through the computers and internet. It can be said that without the help of the computers and internet any library information centre cannot satisfy the users. Khan (2016) argued that, to speed-up accurate and reliable data transfer in future is also a danger of non-availability of hard copies of documents, particularly to secondary sources that are available only on CDROM. Knowing this, continuing education about ICT for libraries is essential. Due to the escalation in prices of periodicals and books, which no library can afford to acquire all the publications; resource sharing through networking is the only way to go.

Information communication and technology has brought unprecedented changes and transformation to academic library and information services, conventional library services such as Online Public Access Catalogues (OPAC), users services, reference services, bibliographic services, current awareness services, Document delivery, interlibrary loan, Audio visual services

and customer relations can be provided more efficiently and effectively using ICT, as they offer convenient time, place, cost effectiveness, faster and most-up-to-date dissemination and end users involvement in the library and information services process (Ashikuzzaman, 2018). Saleem, Tabusum, and Sadik Batcha, (2013) observed that 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, break down the distance barrier and shortened the time required and ensure the right information to the right reader at the right time. It also increases and solves the library's demand of collection development.

Saleem, Tabusum and Sadik Batcha, (2013) in their study measured academic library users and their attitudes towards ICT information. The study also proves how far ICT information make impact on the access pattern among the users of both professional and nonprofessional and the extent of ICT information being increasingly used rather than print resources. they also added that, today's highly sophisticated information technology has facilitated the storage of huge amounts of data or information in a very compact space. Modern ICT is impacting on different aspects of library operation and the information profession. Improvements 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 (Saleem Tabusum, & Sadik Batcha, 2013).

2.10 Challenges Faced in the Accessibility and Use of ICT in Libraries

Okon et al (2005) reported that, lack of staff training and negative attitude of university top management on ICT adoption are important factors against accessibility and use of ICT in university libraries, Okon et al (2005) observed that, the obstacles facing the ICT adoption and use in libraries are lack of awareness by students or users. Another challenge is poor attitude of library

staff towards adoption of automation. the use of information and communication technology is gaining momentum in universities libraries especially now that most universities are adopting ICT in the development and improvement of their service. Therefore, availability of ICT in university libraries will greatly improve accessibility, if proper awareness is created for its use (Oriogu, Ogbuiyiba, Sussan Odoaku, & Ogbuiyi, 2014).

Cullen (2001) revealed that, the advent of ICTs has brought with it its own challenges. Key among them is the digital divide which in essence is "the gap that exists in most countries between those with ready access to the tools of information and communication technologies, and the knowledge that they provide access to, and those without such knowledge and skills". Among other things, one needs good computing facilities, reliable and affordable internet, steady supply of electricity, (Harvey Chaputula, 2012). The problem of poor infrastructural facilities especially erratic power supply has been the major cause of setback in the integration of ICT in library services. Some other challenges to the adoption and use of ICTs are lack of well-trained staff, and poor information literacy skills, among users (Afolabi, A.F & Abidoye, 2002).

According to Odongo, (2011), in an attempt to ensure that libraries remain forecast in their objectives in this era of ICT development, commission for higher education recommended that libraries shall adopt and maintain new information communication technologies as they develop and that every university library shall adopt the new opportunities created by information and communication technology used in teaching, learning and research. Afolabi & Abidoye (2002), posited that, even though ICT is applicable to library service, high cost of ICT equipment could not make it to be widely utilized by most libraries. Findings by Akporhonor & Lucky (2016) revealed that, poor internet connectivity, erratic power supply, information overload and high cost

of access, download delay and difficulty in assessing some websites are some of the factors affecting against the use of online resources by post graduate students.

2.10.1 Challenges faced by librarians in the use of ICT.

Jeliyang (2016) identified four major problems facing librarians in the use of ICT in their work. Most librarians suggested that insufficient staff trained in ICT application is the main problem in ICT application. Though all library professionals are well qualified, Jeliyang observed that, a basic knowledge of ICT applications is essential to provide services in the contemporary ICT environment. The second valid reason was lack of sufficient funds. The third important problem suggested was lack of support from university management. Lack of initiative on the part of library staff was cited by a librarian as another problem for ICT application. Lack of ICT knowledge on the part of users and lack of standard library management software were also pointed out as a barrier in ICT application. Chisenga (2006) also attested to this fact and added that, "Most libraries in sub-Saharan Africa, use of ICTs is largely restricted to traditional library automation, that is replacing manual operations by computerized methods. According to Dzandza & Akussah, (2018), the form of library education received in Ghana is broad based and this does not equip librarian with relevant skill to survive in the rapidly changing environment.

Innovative use of information and communication technologies in libraries is not widespread and it is made difficult, by several challenges, including lack of funds to sustain the ICT infrastructure, inability by librarians or libraries to keep up with the pace of developments in ICTs, inadequate ICT facilities in the libraries, lack of staff with appropriate skills to manage ICTs both at the managerial and operational levels, absence of institutional policies and strategies to support and guide the use of ICTs, and lack of adequate knowledge and skills to manage digital information

resources and to deal with issues relating to copyright intellectual property rights in a digital information environment" (Chisenga, 2006).

Haliso (2011) submits that the use of information technology gives significant benefits in work measurement, cost reduction, productivity improvement and better services to customers and clients. Actually. it is availability of information which makes use of information possible and it is use that makes performance achievable. The combined effect of availability of information and communication technologies can enhance the job performance of the academic librarian. Ramzan (2004) as cited in Adeyinka, (2009) posited that, librarians especially those in developing countries like Nigeria need to develop positive attitude towards the application of ICT library practices. However, the lack of knowledge of appropriate technologies, and the skill to analyse and evaluate library automation project pose a great challenge to library professionals.

The globalization of ICTs has posed challenges to the library professionals' collections, and the radical change in the expectations and needs of the users. In digital environment, library professional's competence lies in: speeding up access to information, speeding up spread of information, filtering material chosen by users, organizing user information sources in standardized keyword and classification schemes, is a unnerving task to most library professional(Shukla, & Sialai, 2018).

2.10.2 Benefits of ICT use to librarians.

librarians must move quickly to learn and adopt new information technologies in order to cope with these challenges posed by ICT (Ramzan, 2004). Ramzan (2004) observed that, computers, software, CD-ROM, email, internet, networks, and other information management and communication technologies were introduced to perform different library functions and to provide innovative user services. At the same time, librarians updated their level of knowledge of new

information technologies through continuing education programmes, professional training, and through revisions in their library and information school curriculums. This helped them to influenced the benefits of new technologies. Saleem et al., (2013), supported the view of Ramzan (2004) and added that, computers have fetched a new benefit to the library and information users. Information technology has assisted library professionals to provide value added quality information service and give more remote access to the globally available information resources.

According to Singh & Kaur, (2009), the ICT and the Internet have opened doors for the library professional to many opportunities. The authors noted that now, access to information is available round the clock and the traditional constraints of space and time has collapsed. Library and Information Professionals (LIPs) can provide global reach to the indigenous knowledge. Similarly, there is access to world knowledge and information through the Internet, provided library professionals have the will, skill, and the appropriate attitude explore them (Singh & Kaur, 2009).

2.11 Chapter Summary

This chapter reviewed relevant literature that are directly to the study area. From the discussions it could be realized that there was a consensus about the need to adopt and use ICT in libraries and in the operations of library activities. The literature review also looked at some factors that can impede the use of ICT by both librarians and students. Some of these factors include lack of ICT awareness by students, lack of relevant ICT knowledge by the library staff, lack of proper ICT infrastructure such as computers, low internet connectivity and erratic supply of electricity.

From the review of literature on the adoption and use of ICT in private universities a gap was observed. Firstly, it was observed that most of the study done on adoption and use of ICT in private university libraries were conducted in places like India, Pakistan, Kenya, and Nigeria. There was

hardly any study on private universities ICT adoption in Ghana. Therefore, this study was to fill the gap.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

A research methodology is a systematic, theoretical analysis of the method applied to a field of study. It is the general research strategy that outlines the way in which research is to be undertaken and among other things define the method to be used. A methodology offers the theoretical underpinning for understanding which method, set of methods, or best practice that can be applied to a specific case, for example, calculating a specific result (Brink, Van, & Van, 2007). This section explained how the study was conducted to allow for validity and reliability of the research. Selection of cases for this study was done in a purposive manner. In achieving the research objectives, this chapter examined the research method with the purpose of finding the right methodology to answer the research questions.

3.2 Research Design

Research design is defined as a framework of methods and techniques chosen by a researcher to combine various components of research in a reasonably logical manner so that the research is efficient. This study employed the sequential explanatory design. A sequential explanatory design implies collecting and analysing quantitative and then qualitative in two consecutive phases within one study. Such issues include deciding on the priority given to the quantitative or qualitative data collection and analysis in a study the sequence of the data collection and analysis and the stages in the research process at which the qualitative and quantitative data are connected and the results are integrated (Mark, Lewis, & Thornhill, 2007).

3.2.1 Research Approach

There are different research approaches. They include quantitative research approach, qualitative research approach and mixed method approach. "A quantitative research is generally associated with the positivist paradigm. It usually involves collecting and converting data into numerical form so that statistical calculation can be made, and conclusions drawn. However, qualitative research is the approach usually associated with the social constructivist paradigm which emphasizes the socially constructed nature of reality. It is about recording, analysing and attempting to uncover the deeper meaning and significance of human behaviour and experience" (Creswell, 2009).

However, this study will use the mixed method approach which involves adopting both the quantitative and qualitative approach. This will help to avoid any form of biases with the use of a single approach.

3.3 Selection of Cases

According to the National Accreditation Board (NAB) (2019) website, there are eighty-one (81) private universities in Ghana running various degree programmes. However, not all private universities run graduate programmes. The private universities selected for this study were selected because they run graduate programmes. Private universities chosen for the study are Central University (CU), Wisconsin International University College (WIUC) and Methodist University College (MUC). The justification for choosing libraries of these three private universities is that they are well established, and they all run graduate programmes and they have been in existence for more than ten years in Ghana.

3.4 Study Population

A research population is generally a large collection of individuals or objects that is the focus of a scientific query (Mobbing, 2009). A study population encompasses persons or objects having at

least one common characteristic. As far as this study is concerned, the target population consisted of graduate students and the library staff in all the selected private universities. The total population of students was three hundred and ninety-two (392). However, the library staff are normally made up of professional and paraprofessionals. The total number of professional librarians in the three selected universities was three (3) and paraprofessionals was 18. The breakdown of the study population is as illustrated in Table 3.1.

Table 3. 1 Population Distribution

INSTITUTION	GRADUATE STUDENTS	PROFESSIONAL LIBRARIAN	PARA-PROFESSIONAL	TOTAL
CENTRAL UNIVERSITY	208	1	5	216
WISCONSIN UNIVERSITY	76	1	5	81
METHODIST UNIVERSITY	109	1	8	121
TOTAL	**393**	3	**18**	**414**

3.5 Sample Size

According to Fraenkel and Wallen (2000), sampling in a research study refers to any group on which information is obtained. Sampling is done because most population of interest are large, diverse, and scattered over a large geographic area. For that reason of necessity, researchers often select a sample to study.

A proportionate random sampling technique was used to select student respondents. According to Kumar (2005) proportionate random sampling technique is the number of elements from each stratum in relation to its proportion if the total population is selected. The justification being that it gives individuals in the population an equal chance of being selected. This guarantees that the sample was a representative of the population and that the sample was selected in an unbiased way. In turn, the statistical conclusion drawn from the analysis of the sample will be valid (Ashley, 2019).

The study used thirty percent of the graduate students as the sample size. Mark, Lewis, & Thornhill, (2007), have explained that when a study population was not too large, the entire population can be studied. Therefore, sample size of the student's respondents was one hundred and eighteen (118). Since the population of the library staff was not too large the entire population of professional librarians and 6 paraprofessionals was considered since they are directly involved in the administration of the library. The total number of paraprofessionals selected was six (6).

Alreck and Settle (2004) pointed out that a sampling ratio of 30% is adequate for a population of less than 1000, a sampling ration of 20% is adequate for a population between 1000 and 10000 and a sampling ratio of 10% is adequate for a population which is above 10000.

For this study, the researcher used 30% of the population of the graduate students as the sample since they are less than 1000. Isreal (1992) mentioned that, If the population is small, then the sample size can be reduced slightly. This is because a given sample size provides proportionately more information for a small population than for a large population.

Table 3. 2 Sample size distribution for graduate students

Population category	Total population	Sample size 30%	Total
Central university	208	0.3*208	63
Wisconsin university	76	0.3*76	22
Methodist university	109	0.3*109	33
Total	393	117.9	118

Table 2

Table 3. 3 Sample size for the study

Population category	Sample size for graduate students	Sample size professionals	Sample size paraprofessionals	Total
Central university	63	1	2	66
Wisconsin university	22	1	2	25
Methodist university	33	1	2	36
Grand total	118	3	6	127

Table 3

3.6 Sampling Technique

"Purposive or judgmental sampling enables you to use your judgement to select cases that will best enable you to answer your research question(s) and to meet your objectives. This form of sample is often used when working with very small samples such as in case study research and when you wish to select cases that are particularly informative. Such samples cannot, however, be considered statistically representative of the total population" (Newman, 2000).

A purposive sampling is a non-probability sample that is selected based on the characteristics of a population. This type of sampling can be very useful in a situation when you need to reach the targeted sample quickly (Ashley, 2019). The researcher used purposive sampling to select all librarians who are heads of the libraries and paraprofessionals because their number is very small and therefore all librarians and two paraprofessionals from each institution were chosen for this study. This research targeted graduate students offering Master of Business Administration (MBA) programmes because all the private universities selected run MBA programme. The justification being that they benefit from information and communication technology through conducting research. Proportionate sampling was used to select student respondents and the researcher used 30% of the population of the graduate students as the sample.

3.7 Data sources

According to Kumar (2005), there are two major approaches to gathering information about a situation, person, problem, or a phenomenon. Sometimes information required is already available and need only to be extracted. However, there are times when the information must be collected. Based upon these broad approaches to information gathering, data are categorized as primary data and secondary data. This research employed both primary and secondary sources of data collection.

3.7.1 Primary Source of Data

Primary data was sourced from data collected from the field through administered questionnaire distributed to respondents and completed by the respondents.

3.7.2 Secondary source of Data

The main secondary data employed in this study were sourced from journal articles, books, previous research works, and website articles in the related topic.

3.8 Instruments for Data Collection

3.8.1 Questionnaire

The research instruments used were the structured questionnaires and semi-structured questionnaires. A questionnaire is a written list of questions, the answer to which is recorded by respondents. In a questionnaire the respondents read the questions, interprets what is expected and writes down the answer. According to Kumar (2005) a questionnaire can be administered in different ways. There are mailed questionnaire, collective administration, and administration in a public place.

Copies of the questionnaire were distributed personally by the researcher using google form. According to Lavrakas (2008), a self-administered questionnaire refers to a questionnaire that has been designed specifically to be completed by a respondent without the intervention of a researcher. Open ended and closed ended questions were used in the questionnaire. The open-ended questions gave respondents the opportunity to write their views to the questions asked. This was done to ensure that complete information that could not be captured by the closed-ended questions were obtained. The closed-ended questions provided several options for the respondents to make a choice.

Student respondents were served with copies of the questionnaire. In all, respondents answered a total of twenty-one questions divided into 4 parts. the first section focused on the demographic characteristics of respondent. Section B elicited information on knowledge of ICT resources. section C focused on user system satisfaction, here the study used closed-ended five-point Likert scale and the last section was on the usage of the library ICT system. The questions were posed base on the research objectives of the study.

The advantages of using a questionnaire are that it is less expensive and comparatively convenient. Particularly when it is administered collectively to a study population. It offers greater anonymity as there is no face-to-face interaction between respondents and researcher. In some cases when sensitive questions are asked it helps to increase the likelihood of obtaining accurate information (Kumar, 2005). Despite these advantages there are however some disadvantages of using a questionnaire in a research. According to Kumar questionnaire are notorious for their low response rates, and if for any reason the respondents do not understand some questions, there is no opportunity for them to have the meaning clarified and this affect the quality of information provided. (See appendix 2).

3.8.2 Semi-Structured questionnaires

Head librarians and paraprofessionals were presented with semi-structured questionnaires by the researcher. The most common type of questions in this type of questionnaire were open-ended questionnaire which demanded qualitative response.

Semi structured questionnaire used were varied for professionals and paraprofessionals. Kumar, (2005), noted that in a structured questionnaire, the researcher ask a predetermined set of questions, using the same wording and order of questions as specified in the questionnaire. The responses to

open-ended questions were analysed by using the thematic approach, where the researcher follows a typology of themes that emerged during the data collection. (See appendix 1 and 3).

3.9 Mode of Data Collection

With the questionnaire designed on google forms before copies distributed, the respondents were informed by the researcher about the study through email. The questionnaire contained brief introduction explaining the purpose of the study, and a statement guaranteeing the confidentiality of respondents. The researcher obtained an official letter of introduction from the Department of Information Studies. In all one hundred and eighteen (118) copies of the questionnaire were distributed. The questionnaire for student respondents were administered through WhatsApp platforms. This was done by contacting class representatives and getting their mobile phone contacts, through which the link was sent for onward distribution on the class WhatsApp platforms. The justification for administering questionnaire to students through WhatsApp platform was because of social distancing protocols being observed due to the corona virus pandemic. Also, most graduate students had busy schedules and it was difficult to meet them in the library or anywhere on campus.

Convenient or haphazard sampling technique was used to collect data from the students' respondents from each institution. Convenient sampling involves selecting haphazardly those subjects that are easiest to obtain for your sample (Mark, Lewis & Thornhill, 2007). The reason for using convenient sampling by the researcher is that master's students normally combine work with schooling, and it is very difficult getting them at a particular location. The researcher administered the semi structured questionnaire to the professionals and paraprofessionals through emails. The researcher was able to get the contacts of respondents through colleagues and personal

contacts of known library staff. The average time spent on completing each question by a respondent was 7 minutes.

3.10 Data Analysis

Data analysis is the process of evaluating data using analytical and statistical tools to discover useful information and in business decision making. Mark, Lewis, & Thornhill, (2007), describe data analysis as breaking down data into units for understanding. Data used for this research was gathered from questionnaire. Quantitative data obtained from this research was analysed using the Statistical Package for Social Sciences (SPSS) version 20. In analysing the data gathered from the field, the completed copies of the questionnaire were checked and sorted by the researcher to ensure that they were complete. Copies of the questionnaire were then entered in excel and coded. The coded response was entered in the SPSS software. The data entered in SPSS was used to copy out the statistical analysis.

Cross-tabulations were used to represent the findings of the study. According to Kumar (2005) cross-tabulation analysis of two variables to determine if there is a relationship between them. Usually the absolute number of respondents, and the row and column percentages, give you a reasonably good idea as to a possible solution.

The quantitative method of data analysis uses graphs, charts and statistics which help to describe and examine relationships and trends within the data. Quantitative data analysis technique assists in the interpretation of data as they are graphically presented. Responses from the semi-structured open-ended interview were analysed using the process of content analysis. By this the main themes of the responses were discussed using descriptive statistics. This helped the researcher summarize the data and find patterns.

3.11 Ethical Considerations

Researchers need to protect their respondents: develop a trust with them, promote the integrity of research, guard against misconduct and impropriety that might reflect on their organizations and institutions, and cope with new challenging problems (Creswell, 2011). The researcher ensured that there is confidentiality of the data collected. The researcher ensured that, the study was conducted in a morally responsible manner. To ensure that the research did not violate any ethical standards, several issues were considered. The study tried as much as possible to avoid plagiarism. Literature was competently reviewed to obtain high quality research. The researcher avoided shading the result of the research.

The participants were not harmed in any way. Moreover, participants were not coerced to take part of this survey if they did not want to do so. The respondent's right to privacy was protected by keeping the information provided as confidential as possible. The researcher obtained a letter of introduction from the Department of Information Studies. (See appendix 4) This was to introduce the researcher to the participants of the study and to seek permission from the management of the institution where the research was to be conducted.

3.12 Chapter summary

This chapter focused on the approach employed in the study as well as the research method, and justification of why a sequential explanatory design was chosen. The chapter also discussed the process of case selection and fieldwork for the study, data collection and analysis. Both quantitative and qualitative methods of analysis were used to collect and analyse data. Questionnaires were used in gathering data for the study using the purposive and convenient sampling approach. Data were analysed using the SPSS software, and descriptive statistics such

as cross-tabulations, means and percentages were used to summarize and describe data in the form of tables.

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This chapter presented the analysed data and findings as collected from selected private university libraries in Ghana. This study was set out to investigate the level of adoption and use of information and communication technology in three private university libraries in Ghana. Both the qualitative and quantitative data analysis is presented together under each theme or objective and sub-themes where applicable. The results of the quantitative data have been presented in tables and figures, which showed percentages and figures, while the qualitative data was analysed thematically. The names of the three selected private universities were also withheld for anonymity due to the possible effect of the outcome of the study on the various libraries. The selected universities were given codes by the researcher. The names of the universities have been coded as AA, BB and CC. The head librarians sampled for the study were coded to represent HL1, HL2, and HL3. The paraprofessionals were also coded to represent PP1, PP2, PP3, PP4, PP5, and PP6. The students from university AA were represented by STA, students from University BB represented by STB and students from university CC were represented by the code STC.

This chapter begins with a summary of the statistics of the demographic profile of respondents who participated in the study. The other sections were organized under the major themes as outlined in the objectives of the study.

1. To assess the level of adoption of ICT in the selected private university libraries.

2. To find out how easy it was to use the ICT resources in the selected private university libraries.

3. To find ascertain the level of support by management in the use of ICT resources and its usage in the selected private university libraries.

4. To find out how skilful and knowledgeable the staff were in the use of ICT in the selected private university libraries.

5. To ascertain the usefulness and ease of use of ICT resources in the selected private university libraries.

The study considered three different groups of library ICT facilities users and how they benefited from ICT infrastructure in the library. The category of users who took part in the study were the head librarians, paraprofessionals, and students. The questionnaire was administered to elicit information about whether or not management of private universities were willing to invest in ICT facilities in the various libraries, and how ICT was enhancing the work of library staff, also ascertain whether the ICT infrastructure was enhancing students learning and research. While conducting this research, the researcher also observed the libraries. The response rate for students was 89%, which considered as high.

4.2 Demographic Data

Demographic data is information about a group of people according to certain attributes such as age, gender, place of birth, and can include socio-economic factors such as occupation, family status or income.

Distribution of gender of HL were 1 male and 2 females. Respondents were between the age range of 40 to 60. All respondents worked in the library department. HL AA and BB had MPhil degree in library studies while HL CC had a PHD in library studies. Institutions of respondents were

represented by AA, BB, and CC. Respondents were all senior members within the university ranking. Respondents had served in their various libraries between eleven (11) to fifteen (15) years.

The demographic data of paraprofessionals covered gender, age group, qualification, rank, period of service, current department, and institution respondents were working for.

The distribution of PP respondents was, two (2) from AA, two (2) from BB and one (1) from CC. Gender distribution of respondents was three (3) females and two (2) males. This shows that the paraprofessionals were dominated by females. Paraprofessionals were between the ages of 30 to 39. Four of the respondents were between the age range of 30-39 and only one was between age 40-49. All the respondents worked in the library departments. All respondents held the Bachelor of Art degree and were all junior members within the university ranking. three of the respondents had served in their various libraries for more than 10 years, one respondent had worked for 6 years and one had served for less than five years. This revealed that most respondents had worked in the library departments for a long time.

The analysis of survey statistics on demographic profile of students was presented in this section. In all one hundred and four (104) students, out of one hundred and eighteen (118) completed and returned the copies of the questionnaire.

4.2.1 Gender of Student Respondents

The gender distribution of students was shown using frequency table as displayed below.

Table 4. 1 Gender distribution of student's respondents

University		Gender of student's respondent				Total	
		Male		Female			
		Freq.	%	Freq.	%	Freq.	%
	AA	29	67.4	14	32.5	43	100.0
	BB	24	70.5	10	29.4	34	100.0
	CC	18	66.6	9	33.3	27	100.0
Total		71	68.2	33	31.7	104	100.0

Source: Field data 2020

The gender distribution of respondents was shown in Table 4.1 From the table, it can be observed that majority of student respondents were male. The total number of students form AA were 43 (41.3%) which was made up of twenty-nine (29) males and fourteen females. In the case of BB, the total number of respondents were 34 (32.6%), twenty-four (24) of the respondents were male and ten (10) were female. The total number of respondents from CC were 27 (25.9%), eighteen (18) of the respondents from CC were males and nine (9) were females. This meant that majority of students in the private universities were male.

4.2.2 Students Programmes Distribution

Respondents were asked to indicate the programmes they were pursuing at the various universities. Programs distribution of respondents is shown in Table 4.2. From the programme distribution, it was observed that 10 (23.2%) respondents from AA offered accounting. Eleven 11 (25.5%) respondents offered MBA finance. Ten 10 (23.2%.) offer MBA in human resource management.

Six 6 (13.9%) offered MBA marketing, Five 5 (11.6%) offered MBA management and One 1 (2.3%) respondent offered MBA project management.

Out of the thirty-four (34) respondents form BB, 12 (35.2%) offered MBA accounting, 9 (26.4%) offered MBA finance, 7 (20.5%) offered MBA HRM, 1 (2.9) offered marketing, 5 (14.7%) offered management and non-offered project management. Out of the twenty-seven (27) respondents from CC, 7 (25.9%) offered MBA accounting, 8 (29.6%) offered MBA finance, 4 (14.8%) offered MBA human resource management, 3 (11.1%) offered marketing, 4 (14.8%) offered management and 1 (3.7%) offered project management. The programs distribution showed that, majority of respondents offer MBA accounting, followed by finance and human resource management.

Table 4. 2 Programme of Study

University	Programme of study												Total	
	Accounting		Finance		HRM		Marketing		Management		project management			
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
AA	10	23.2	11	25.5	10	23.2	6	13.9	5	11.6	1	2.3	43	100.0
BB	12	35.2	9	26.4	7	20.5	1	2.9	5	14.7	0	0	34	100.0
CC	7	25.9	8	29.6	4	14.8	3	11.1	4	14.8	1	3.7	27	100.0
Total	29	25.9	28	26.9	21	20.1	10	9.6	14	13.4	2	1.9	104	100.0

Source: Field data 2020

4.3 Level of ICT Adoption and Use

With the first objective being to assess the level of adoption to ICT by the selected private universities, and so respondents were asked to indicate their level of adoption and use of ICT in the various libraries.

HL of AA said that

> "*our library's adoption rate is high*".

HL of BB said

> "*ICT adoption is high*".

HL of CC also said

> "*our library has adopted ICT*".

The results showed that overall libraries in the private universities also have a high level of adoption.

Paraprofessional staff's response was not different from that of the head librarians. Most of the respondents ascertained that they had high adoption level. Respondent from AA rated their adoption level as very high, whilst BB and CC rated their level of adoption as high as revealed by the comments about the level of adoption rate.

4.3.1 Library Operations and ICT Use

On the question of what library operations librarians use ICT to perform their daily routine in the library. The findings indicated that, AA, BB, and CC mainly used ICT for processing library materials. However, HL of AA said

"*we use ICT for circulation and acquisition of library materials*".

The paraprofessionals where asked the same question and their response also proved what their HL said. Paraprofessional from AA said that,

"*our library uses ICT for acquisition*".

Paraprofessionals from BB said,

"*we use ICT for circulation purposes*".

paraprofessionals, from AA and CC said,

"*we use ICT for processing of library's new collection*".

4.3.2 Factors Considered by Librarians to Sustain ICT Based Library Services in the Libraries

Head librarians were asked about their opinion on what they considered would sustain ICT in the libraries. HL from AA said,

"*the availability of trained library staff in the field of ICT will help sustain ICT in the Libraries*".

HL from CC also said that,

"*availability of internet services and adequate power supply could help sustain ICT services in the libraries"*.

HL from BB added that,

"*availability of awareness program in the use of digital libraries*"

The HL revealed that adoption has improved quality of service to their libraries.

4.4 Level of ICT Support by Management

Objective three (3) of this research meant to find out the level of top management's commitment and support in adopting and using ICT in the libraries.

Librarians were asked whether their university management were committed to supporting the adoption and use of ICT in their libraries. AA librarian said, "*yes*", and BB librarian said,

"I *agree*". Also, CC librarian also responded, "*yes*".

This meant that management of private universities showed commitment and support towards the use of ICT in their libraries.

4.4.1 Managements motivation and reward for performance of staff in ICT

The researcher wanted to find out whether management motivated and rewarded performance of staff who excelled in the use of ICT. The responses were that HL of AA said

"*not really.*

HL of BB said,

"*No, they don't*".

HL of CC said

"*I agree*".

These responses meant that managers of private universities were not committed to rewarding excellence in the performance of staff who excelled in ICT advancement in their libraries.

The researcher further asked if management was quick to address problems and complaints that arose out of the use of ICT in the libraries. The responses were that HL of AA

"*sometimes yes but not always*".

HL of BB said

"*yes*",

HL of CC also said she

"*I agree*".

The findings showed that management was quick to address problems and complaints that arose out of the use of ICT in their libraries.

4.4.2 Level of Training in ICT and ICT Based Library Facilities.

In order to ascertain the level of training in ICT and ICT based library facilities, both the library staff and students were asked whether they were able to use ICT efficiently to do their work. The researcher also wanted to find out whether the students also had the necessary knowledge in ICT to help them access ICT based library materials or to conduct research.

The HL of AA said that,

"*to a high extent*".

while BB said,

"*high level of training*"

CC respondent said,

"*high level of training in ICT and ICT based facilities*".

However, with PP2 from AA, PP1 from CC and PP1 from BB said they had

"*high knowledge in ICT training and could use ICT based facilities effectively*",

PP2 from BB said

"*I had moderate training in ICT*".

this showed that librarians in private universities had invested in upgrading their knowledge in ICT.

Student respondents were asked to indicate their level of knowledge about the use of ICT and the findings showed that 36 (83.7%) respondents from AA ranked their knowledge of ICT as high, 4 (9.3%) ranked their knowledge as moderate and 3 (6.9%) ranked their very high. in ICT usage. Out of thirty-four 34 respondents from BB, 30 (88.2%) respondents ranked their knowledge of ICT as high, 2 (5.8%) ranked their knowledge as very high and 2 (5.8%) ranked their knowledge as moderate. The total number of students who responded to the question from CC was 27 and 19 (70.3%) ranked their knowledge of ICT as high, 6 (22.2%) of the respondents ranked theirs as moderate, and 2 (7.4%) ranked their knowledge as very high.

This showed that respondents had a high knowledge about the use of ICT.

Table 4. 3 Level of ICT Use

University	Level of ICT use						Total	
	very high		High		Moderate			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
AA	3	6.9	36	83.7	4	9.3	43	100.0
BB	2	5.8	30	88.2	2	5.8	34	100.0
CC	2	7.4	19	70.3	6	22.2	27	100.0
Total	7	6.7	85	81.7	12	11.5	104	100.0

Source: Field data 2020

4.5 Library Staff's Knowledge and Competence in the Use of ICT

library staff and student's perception, knowledge, competencies, and training with regards to the use of ICT. The research sought to ascertain library staff's readiness and competence in using ICT to provide better services to their clients.

The researcher wanted to find out how library staff felt if they must use ICT in their daily routine, responses were that HL of AA said,

"*am comfortable*".

HL of BB said,

"*am enthused*".

HL of CC said,

"*as librarians we need to use ICT everyday so its normal to use technology to work*".

However, the responses from paraprofessionals revealed that, PP of BB1 said,

"*am very enthused and will like to use ICT always*".

PP from AA1 said,

"am happy to use ICT for my work".

PP of CC

"*it is normal to use ICT for work*".

PP of AA2 said,

"it's normal".

This showed a positive attitude by the librarians toward the use of ICT in their daily work.

To ascertain whether students knew about the online resources in the library through user education, the response from the students were that 25 (58.1%) learnt it through written instructions 10 (23.2%) from AA revealed they learnt it on their own. Seven 7 (16.2%) said they learnt it through training sessions organized by the library, and 1 (2.3%) said they learnt it through friend and relatives. However, findings from BB showed that 20 (58%) said they learnt it through written instruction, 9 (26%) said they learnt it through training sessions organized by the library while 5 (14.7%) learnt how to use the library online resources on their own. Findings from CC also revealed that, 17 (62.9%) respondents learnt how to use the library online resources through

written instructions, 8 (29.6%) said they learnt how to use the library online resources through training sessions organized by the library and 2 (7.4%) learnt it on their own.

These finding showed that respondents from the various institutions learnt to use library online resource through written instructions. The findings also revealed that some also learnt how to use the resources from the library information literacy sessions and some on their own.

Table 4. 4 Knowledge about Library online resource

University		knowledge about Library online resource								Total	
		on my own		through training session		through written instructions		from friends and relatives			
		Freq	%	Freq.	%	Freq.	%	Freq.	%	Freq	%
	AA	10	23.2	7	16.2	25	58.1	1	2.3	43	100.0
	BB	5	14.7	9	26	20	58	0	0	34	100.0
	CC	2	7.4	8	29.6	17	62.9	0	0	27	100.0
Total		17	16.3	24	23.0	62	59.6	1	0.7	104	100.0

Source: Field data 2020

4.5.1 Knowledge and skill in the following ICT areas.

To find out whether library staff have the knowledge in the use of internet applications to facilitate their work. This question was posed the library staff since they use ICT in their daily routine. The

researcher asked series of questions to ascertain the fact. On the issue of whether librarians could use Internet applications (e.g., Installation, webpage designs, troubleshooting) the responses were that HL of AA said,

"*I have average knowledge in Installation*".

HL of BB University said,

"*I do not use the service*".

HL of CC University said,

"*I have average knowledge*".

These responses indicated that the respondents were not well familiar with the area of installation and webpage designing. Paraprofessional's response were PPAA 1, PPBB1 and PPAA 2, said that they had

"*average knowledge about the use of ICT applications"*.

PPBB2 said that,

"*I am good at web applications*".

PPCC said,

"*I am not too good at using installations but can use ICT applications*".

Respondents were further asked if they are good at using Library Software Packages, web tools and Services, Information Retrieval and Storage materials, barcode technology, and the responses were as follows;

HL of AA said,

"*I know how to use all these services*".

HL of BB said,

"*I am good at using all the services except the barcodes*".

HL of CC said,

"*Yes, I am good at using them*".

However, the paraprofessionals responses were almost similar to those of the HL.

PPAA 1 said,

"*good at using web tools and services*".

PPCC said,

"*I am good at using all the services*".

PPBB 1 said,

"am *good at using the web but don't use the barcodes*".

PPBB 2 said,

"I don't use the barcode".

PPAA 2 respondent said,

"*am average*".

These responses showed that most library personnel were good at using web tools and services. This proves that librarians have good knowledge about the use of social media. This also meant that respondents are good at software package they have subscribed to. However, respondents of BB revealed they did not use the barcode in their library.

4.6 Ease of Use of Library Resources

Since students are the end users of any ICT resources in the library, the researcher wanted to find out whether the library ICT systems were easy to use.

The response from AA University was as that Thirty-seven (86.0%) of respondent agreed that the system was easy to use, three 3 (6.9%) respondents were neutral about the question and three 3 (6.9%) strongly agreed that the system was easy to use. However, responses from BB University showed that twenty-nine 29 representing (85.2%) agreed that the system was easy to use, four 4 (11.7%) were neutral about the question, while one respondent strongly agreed that the system was easy to use. The response from CC were that twenty-three 23 (85.2%) agreed that the system was easy to use. Three 3 (11.1%) strongly agreed and one 1(3.7) respondent was neutral to the question.

Table 4. 5 Ease of Use of ICT System

University		Is ICT system easy to use						Total	
		Neutral		Agree		strongly agree			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	3	6.9	37	86.0	3	6.9	43	100.0
	BB	4	11.7	29	85.2	1	2.9	34	100.0
	CC	1	3.7	23	85.2	3	11.1	27	100.0
Total		8	7.6	89	85.5	7	6.7	104	100.0

Source: field data 2020.

4.7 Usefulness of Libraries ICT Resources

This section was to ascertain whether the library resources were useful to the needs of the students. The librarians were asked whether the ICT recourses were useful for the needs of the students. Their responses were,

HL of AA said

"*Very useful*"

HL of BB said,

"*Very useful*"

And HL of CC also said,

"*Very useful*"

The students were also asked whether the ICT resources in their library were useful. The results showed that thirty-eight 38 (88.3%) of respondents from AA University agreed that the system provided useful information, three 3 (6.9%) strongly agreed that the system provided useful information while 2 (4.6%) were neutral about the question. Thirty-one 31 (91.1%) of respondents from BB University agreed that the system was useful to them, 2 (5.8%) strongly agreed that the ICT system was useful to them and one 1 (2.9%) was neutral about the question. Response from CC University showed that twenty-seven 27 (100) said the ICT resources in their library were very useful to them.

4.7.1 Satisfaction with Resources Provided by the University Library

To further assess the usefulness of the library resources the students were further asked a series of questions to ascertain the facts. To find out whether respondents were satisfied with resources provided by their university library. The response from AA University were that six 6 (13.9%)

indicated they are moderately satisfied with the ICT resources in the library. thirty-four 34 (79.0%) revealed they were satisfied with the library ICT resources, six 6 (13.9) were discreetly satisfied with the ICT resources and three 3 (6.9) indicated they were strongly satisfied with the ICT resources in the library. The findings from BB University revealed that 31 (91.0%) said they were satisfied with their library ICT resources and 3 (8.8%) said they are strongly satisfied with the ICT resources they receive in the university library. However, response from CC University revealed that twenty-five 25 (85.7%) of respondents said they were satisfied with the resources they receive from their institution's library, while three 3 (7.4%) said they were strongly satisfied with the ICT resources in the library. This showed that private university libraries are well equipped with ICT resources to help serve the needs of their students.

Table 4. 6 Satisfaction with ICT resources

University		Satisfaction with ICT resources						Total	
		moderately satisfied		satisfied		strongly satisfied			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	6	13.9	34	79.0	3	6.9	43	100.0
	BB	0	0	31	91.0	3	8.8	34	100.0
	CC	0	0	25	85.7	2	7.4	27	100.0
Total		6	5.7	90	86.5	8	7.6	104	100.0

Source: field data 2020

4.7.2 Information Provided is Clearly Presented on the Screen

This question was to ascertain whether the information provided is clearly presented on the screen. The responses from AA University were as follows. Thirty-three 33 (76.7%) of respondents agreed that the information provided was clearly presented on the screen, three 3 (6.9%) were neutral about the question, while two 2 (4.6%) strongly agreed to the question that information provided were clearly presented on the screen. Thirty-three 33 (97.0%) from BB University, agreed that information presented were clearly presented on the screen, while one 1 (2.9%) respondent strongly agreed that information provided was clear. Responses from CC showed that twenty-four 24 (88.8%) agreed that information provided was clear, two 2 (7.4%) said they strongly agreed to the assertion that the information presented on the screen was clear and one 1 (3.7%) was neutral to the question. This indicated that students could see and understand clearly what is written on the screen.

Table 4. 7 Information Provided is Clearly Presented on the Screen

		Information Provided is Clearly Presented on the Screen							
		Neutral		Agree		strongly agree			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	3	6.9	38	76.7	2	4.6	43	100.0
	BB	0	0	33	97	1	2.9	34	100.0
	CC	1	3.7	24	88.8	2	7.4	27	100.0
Total		4	3.8	95	91.3	5	4.8	104	100.0

Source: Field Data 2020

4.7.3 System Provide Readily Accessible Information

To find out whether the system provided readily accessible information the responses from CC University revealed that thirty-five 35 (81.3%) agreed the system provided accessible information, six 6 (13.9%) strongly agreed that the system provided readily accessible information while two 2 (4.2%) of respondents were neutral. The responses from BB University were that thirty-one 31 representing (91.1%) agreed that the system provided readily accessible information, two 2 (5.8%) strongly agreed that the system provided readily accessible information and 1 (2.9%) of respondent was neutral about the question. The responses from CC were that twenty-seven 27 (100%) respondents agreed that the system provided readily accessible information.

Table 4. 8 Readily Accessible Information

University		accessible information						Total	
		Neutral		Agree		strongly agree			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	2	4.2	35	81.3	6	13.9	43	100.0
	BB	1	2.9	31	91.1	2	5.8	34	100.0
	CC	0	0	27	100	0	0	27	100.0
Total		3	2.8	93	89.4	8	7.6	104	100.0

Source: Field Data 2020

4.7.4 Adequacy of Technical Support Available for the Libraries.

The HL and paraprofessionals were asked to indicate whether the technical support available for them when they had challenges was adequate. All three HL indicated that they had adequate technical support.

HL of AA said,

> "*Quite well*"

HL of BB said,

> "*High*"

HL of CC said

> "*We have adequate technical support*".

Thematically, these responses indicate that the libraries get adequate support from the technical department whenever they encountered challenges with ICT equipment.

Paraprofessional PPAA 1 said,

> "*we have adequate technical support".*

PPCC revealed that,

> "*they are always here to help solve our problems*".

PPBB respondents said,

> *"sometimes they respond quickly but other times we have to wait for a while".*

4.7.5 Reliability of ICT System

On the question of whether the system operated reliably, the responses from AA Universities were that forty 40 (93.0%) agreed that the library information system operated reliably, two 2 representing (4.6%) strongly agreed that their ICT systems operated reliably and one 1 (2.32%) was neutral about the answer. The responses from BB University were that thirty-one 31 (91.1%) agreed to the question that their information system operated reliably and three 3 (8.8%) strongly agree with the question. However, the responses from CC University indicated that twenty-five 25 (92.5%) of respondents agreed they had reliable ICT system. One 1 representing (3.7%) was neutral about the question, and one 1 (3.7%) strongly agreed that the system was reliable. The results showed that most students are satisfied with their library ICT systems.

Table 4. 9 Reliability of the System

University		operates reliably						Total	
		Neutral		Agree		strongly agree			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	1	2.3	40	93.0	2	4.6	43	100.0
	BB	0	0	31	91.1	3	8.8	34	100.0
	CC	1	3.7	25	92.5	1	3.7	27	100.0
Total		2	1.9	96	92.3	6	5.7	104	100.0

Source: field data 2020

4.7.6 Library Information System Adaptation to Meet a Variety of Needs

Respondent were asked whether the library information system could be adapted to meet a variety of needs, and this was their response. Thirty-seven 37 (86.0%) from AA University agreed that their library's ICT system could be adapted for a variety of needs, four 4 (9.3%) respondents were neutral about the question while two 2 (4.6%) strongly agreed with the statement that, the system can be adopted to serve a variety of needs. Thirty-four 32 (94.1%) from BB University agreed that their ICT system could be adapted to meet a variety of needs, one 1 (2.9%) strongly agreed that the system could be adapted to meet a variety of needs and one 1 (2.9%) was neutral. The responses from CC were that twenty-three 23 (85.1%) agreed that the system could be used for a variety of need, three 3 (11.1%) strongly agreed with the question that the library ICT system can be adopted to meet variety of need and one 1 (3.7%) was neutral about the question.

Table 4. 10 ICT System Adaptation to Support Variety Needs

University								Total	
		Neutral		Agree		strongly agree			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	4	9.3	37	86	2	4.6	43	100.0
	BB	1	2.9	32	94.1	1	2.9	34	100.0
	CC	1	3.7	23	94.1	3	11.1	27	100.0
Total		6	5.7	92	88.4	6	5.7	104	100.0

Source: field data 2020

4.7.7 Library Information System Integrates Data from Different Sources

On the question of whether the library ICT system integrates data from different sources, thirty-seven 37 (86.0%) from AA University agreed that the system integrates data from different sources, four 4 (9.3%) strongly agreed that the system integrates data from different sources and two 2 (4.6) were neutral. Responses from BB were that thirty-two 32 (94.1%) agreed that the ICT system could integrate data from different sources, one 1 (3.7%) strongly agreed that the system integrates data from different sources while one 1 (3.7%) respondent gave a neutral response. However, all respondents from CC University representing twenty-seven 27 (100%) of respondents agreed to the question that, their library ICT system integrates data from different sources. This response from table 4.11 proves that the library ICT system could help students in diverse ways.

Table 4. 11 LIS Integrates Data from Different Sources

University		LIS integrates data from different sources						Total	
		Neutral		Agree		strongly agree			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
	AA	2	4.6	37	86	4	4.6	43	100.0
	BB	1	3.7	32	94.1	1	3.7	34	100.0
	CC	0	0	27	100	0	0	27	100.0
Total		3	2.8	96	92.3	5	4.8	104	100.0

Source. Field data 2020

4.7.8 Primary Usage Purpose

The researcher wanted to find out what the respondents usually use the library ICT system for, the findings were that all respondents from the three universities revealed they use the system for mainly research purpose. This is shown in table 4.12

Table 4. 12 Primary Usage Purpose

University				Total	
		Research			
		Freq.	%	Freq.	%
	AA	43	100	43	100.0
	BB	34	100	34	100.0
	CC	27	100	27	100.0
Total		104	100	104	100.0

Source. Field data 2020

4.7.9 System Benefit

To ascertain whether the library ICT system were beneficial, all respondents indicated that their University ICT system was beneficial. This rated hundred percent "Yes" response from all respondents. Response from AA was 43 (100%), BB was 34 (100%) response and CC 27 (100%).

Table 4. 13 System benefit

University		System benefit		Total	
		Freq.	Yes	Freq	%
	AA	43	100	43	100.0
	BB	34	100	34	100.0
	CC	27	100	27	100.0
total		104	100	104	100.0

4.8 Chapter Summary

This chapter gives a summary and description of the results gathered. The data analysis was presented according to the broad themes of the study. The results from the study on adoption and use of information and communication technology in private universities revealed that most private university have a high level of ICT adoption. Additionally, the findings reveal that the management of private universities understudied were willing to support the adoption and use of ICT in their various institutions and this has manifested in how they have been able to provide ICT equipment to the libraries. Moreover, the findings of the study further revealed that library staff were highly knowledgeable in ICT which could be attributed to the positive attitudes and perceptions they exhibited toward ICT systems.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter presented a discussion of the findings of the study in relation to the objective of the study and taking in to account the existing knowledge in the area of study. The purpose of the study was to examine the level of adoption and use of information and communication technology in selected private university libraries in Ghana. The objective of the study was: 1. To find the level of ICT adoption in the selected private university libraries. 2. To find out whether it is easy to use ICT resources in the selected private university libraries. 3. To find out the level of awareness of ICT resources and its usage in the selected private university libraries. 4. To find out how skilful and knowledgeable the staff are in the use of ICT in the selected private university libraries and 5. To ascertain the usefulness of ICT resources in the selected private university libraries. The discussion of the findings was in relation with the objectives and the conceptual framework of the study which is the Technology Acceptance Model (TAM).

This chapter provided the researcher with the opportunity to compare the differences and similarities of the areas in which the research has been carried out. It also helped the researcher interpreted the meanings of the findings. The discussions were based on the themes derived from the research objectives.

5.2 Demographic Characteristics of Respondents

Looking at the demographic characteristic of respondents it was realized that gender distribution of respondents among the librarians was two (2) females and one (1) male and the

paraprofessionals distribution was (3) females and (2) males. The distribution of gender among the student's respondents was (71) males and (33) females this implies that majority of library staff were females while most student's respondents were male. According to Primo, (2003), women present the main economic force in most developing countries therefore the issue of women access to and use of ICT is growing in importance for both developed and developing countries. There has been much debate across disciplines as to whether women's use of computers is more problematic than that of men's and women are frequently portrayed as afraid of technology, computers and the Internet – alienated by the masculine culture surrounding them (Karanja, 2017).

Librarians were between the age range of forty (40) to sixty (60) while paraprofessionals were between the age range of 30-39 and 40-49 years. The student age range was also between 29- 40 years. This meant that most participants of the study were in their youthful age and the likelihood of them using ICT was high. The library was at the center of the study and therefore, all respondents who took part in the survey work in the library department.

In relation to the number of years library staff have worked in the various libraries, the study found out that most workers in the three university libraries had worked in the library for a long period of time and therefore has gained knowledge in the use of ICT in relation to their work. Respondents have served in their various libraries between eleven (11) to fifteen (15) years. Three (3) of the respondents have served in their various libraries for more than 10 years, one respondent has worked for six (6) years and one has served for less than five years.

5.3 Level of ICT Adoption in The Library

Head librarians indicated that their libraries have a high adoption level. This shows that libraries in the private universities also have a high level of adoption. Paraprofessional ascertained that they have high adoption level. One (1) respondent said their adoption level was very high, two (2) respondents said they have a high level of adoption and two said their level of adoption is moderate. Adebayo et al., (2018), are of the view that adoption of ICT in libraries is a way of improving on information services provided in libraries. However, the students were asked to indicate their personal knowledge about ICT and the responses showed a high level of knowledge in ICT. The students were further asked how they learnt to use the ICT resources and their responses showed that majority of them leant it through written instruction. Onyebuchi & Ngwuchukwu,(2013) in Yeboah & Owusu-ansah, Christopher M Dadzie, (2017) noted that, if lifelong learning capabilities are to be inculcated into students, educational institutions at the pre-university level must integrate IL into their curriculum. Grimus (2000) is of the view that, ICT makes education accessible anywhere, anytime, and anyhow. ICT has the potential to make educational resources accessible and improve on quality of knowledge sharing and management of the educational system entirely.

5.3.1 Areas Libraries Use ICT for Its Operation

Head librarians agreed that they use ICT for mainly processing of library materials but respondents from AA added that they use ICT for circulation and acquisition. Paraprofessionals where asked the same question and they also indicated that one (1) person mentioned that they use ICT for acquisition. Two said they use ICT for circulation purposes and three said they use ICT for processing of library's new collection. This indicated that ICT can be used for different purposes in the library. Kumar, (2017) noted that, the fundamental function of information technology is to manage the vast collection of library materials. There is no limit to what ICT can do in the library.

According to Adeleke, A.A. and Olorunsola (2010), If libraries are to function effectively in the present age, the manual processes or methods will have to give way to information and communication technologies (ICT) and a computer driven environment. Ensuring this requires training and retraining on the part of the practicing librarians, who must be ever willing to keep abreast of recent developments in the field of Library and Information Science.

The students were asked where they usually use the library resources and the responses indicated that, most of them use ICT in the library. This meant that the libraries can provide the students with adequate ICT resources hence, most of them use it. Twenty (20) from AA, thirteen (13) from BB and CC eighteen (18).

5.3.2 The Impact of Adoption and Usage of ICT to Libraries

Head librarians were asked that what impact has the adoption of ICT brought to their libraries? and their response were that adoption has improved quality of service delivery to their libraries. The response from the librarians was supported by Aliu, (2011)'s view, who asserted that the function of a university library is to provide effective, timely and relevant information to serve the varied information needs of community of users. Hence the adoption of ICT in university libraries to enhance information provision is a necessity. To find out the level of commitment of management of the universities the study asked series of questions to ascertain the fact.

5.4 Level of ICT Support by Management

A question was posed to only the head librarians that, what level of support do they get from management? since they oversee to the needs of the various libraries. All three librarian's

respondent “yes” to the question and they also revealed that, management shows commitment and support ICT use in the libraries. This meant that management of private universities are committed towards providing ICT in the libraries. This finding is in disagreement with that of Jeliyang's (2016) who, observed that, private universities’ major problem was lack of support from university management. This showed the commitment of managers of private universities to support ICT use in the libraries. According to Omotayo & Chigbundu, (2017) It has been found out that leadership behaviour of senior management plays an important role in determining the success or failure of an ICT implementation in organizations; thus, there is the need for strong leadership in ICT implementations.

5.4.1 Management Motivation and Reward for Performance of Staff in Advancement of ICT in Libraries.

The results of the finding revealed that, two (2) HL respondents strongly disagreed with the assertion that management reward staff who are advanced in ICT. and one (1) respondent was neutral to the question. This response meant that managers of private universities are not committed to rewarding excellence in performance of staff who excel in ICT advancement in their libraries. Study by Chigona, Chigona, & Davids, (2014) noted that it is very important for library staff to acquire ICT skills to be more competitive in the face of competition with other professionals. Without adequate ICT skills, librarians would not be able to cope with information explosion of today’s information society. ICT skill by librarians rather help in the development of their carrier and this should not be linked with reward by management.

5.5 Library Staff Attitude, Knowledge and Competence in the Use of ICT

The respondents revealed that they are enthused to use technology to work. This shows a positive attitude by the librarians toward the use of ICT in their daily work. The same question was posed by the paraprofessionals and the findings showed that three (3) respondents said they feel very enthused and will like to use ICT always, but two (2) respondents said it is normal to use ICT for their work. This response means that library staff attitude towards ICT use is positive. According to Spacey, Goulding, & Murray, (2004) The Technology Acceptance Model (TAM) was not designed specifically to measure attitudes but rather technology acceptance, which was considered the most important factor in determining the success or failure of an information system at a time when organizations were investing large sums of money in computerized systems for employees

The response by the students showed that most of them use the library resources to do research. Achimugu, Oluwagbemi, & Oluwaranti,(2010), there should be an assessment of ICT which considers, all areas of an institution including teaching, research, administration and management, Respondents were asked where they usually use the library online resources, and the responses were that majority of the students use the online resources at the library.

5.5.1 Knowledge, Skill, and Competency in the Use of Technology Related Equipment

Respondents rated themselves as having high skill and competence in the use of technology related equipment. HLAA rated herself “high”. Respondent from HLBB rated himself as “high” and HLCC also rated herself “high”. This proves that all respondents have the knowledge, skill, and competence in using technology related equipment in their work. Paraprofessionals PPAA 1, PPAA 2 and PPCC revealed that they have high Knowledge, skills, and competence about the use of technology and its related equipment but PPBB 1 and PPBB 2 said they have moderate knowledge about using ICT and its related equipment. Fakkirappa & Ramesh, (2013), are of

the view that, to work in continuously changing and transforming technological environment in these libraries, it is essentially needed on the part of the library and information professionals to acquire and develop necessary skills and competences on the different techniques of ICT skills.

Students were asked where they would like to use the library online resources to ascertain whether they are satisfied with the resources in the library. The findings revealed that most students use the library online resources in the library. some also indicated they use the online resources in the university ICT center and at home.

These responses indicated that most respondent from the three universities use the online resources in the library but the margin of response from those who use it at the university ICT center and at home was not too big. It also meant that most students got maximum benefit from using ICT resources in the library than anywhere else. Tessa Withorn, et al (2018) studies frequently seek to measure students' information literacy and information communication technology (ICT) skills, and the impact of information literacy programme on academic success measures.

5.5.2 Knowledge and Skill in the Following ICT Areas.

The competence of library staff in ICT in the following areas was tested and the findings are that, most library staff do not have knowledge in the areas of installation but have good knowledge in the areas of Web tools and Services, use of Library Software Packages, use of library technologies such as the barcode scanners and Information Retrieval and Storage materials. The knowledge in these ICT areas means that librarians are well equipped to serve their customers. This also means that librarians need to be trained as systems librarians to oversee to technical challenges that arise in the libraries. It is a given that all librarians must continually learn new skills, new tools, and

new approaches to managing and providing access to information. For systems librarians, this basic characteristic of their jobs requires that they respond to developments in technology at several levels they must keep current with what technologies are available (Jordan, 2003).

Paraprofessional's responses are PPAA 1, PPBB1 and PPAA 2, mentioned that they have average knowledge about the use of ICT applications. PPBB2 revealed that he is good at ICT applications and PPCC said he is poor at ICT applications. HL from AA university respondent revealed said "I have average knowledge in Installation". HL from BB University said, "I do not use the service", and HL from CC University respondent said she has average knowledge.

5.5.3 Library Staff Training in ICT Organized by Institution

To find out whether library staff have received training from their institutions, the results proved that AA University and CC University librarians revealed that they had training in ICT. The two HL further indicated that their training was sponsored by their institutions, but BB University respondent said "*no*". the positive response from the AA and CC librarians showed that their institutions were very committed in improving ICT in the libraries.

Librarians who responded positively to the previous question were asked to indicate the outcome of their last training and HLAA said "*my last training was very effective*". HLCC also said "my last training was very successful in upgrading and improving my skills and ICT".

PPAA 1 and 2, and PPCC said they had received training form their institution but PPBB 1 and 2 said they have not received any training form their institution. These responses supported the views by the librarians. The respondent who said they received training said, "their training in ICT was very effective". All library staff needs training from time to time to sharpen their skills and

competences to serve their clients in a better way. Introduction of ICT in a variety of library environments and into society generally, are explored. The value of ICT and attitudes are often seen as being important in determining the successful implementation of ICT in libraries. Training is suggested as an appropriate means of enabling staff to cope effectively with technological change. Successful training needs to appreciate that staff have different needs and so prefer different training methods (Spacey, Goulding, & Murray, 2003).

The students were asked to indicate how long they have had experience with the use of ICT and majority of respondents revealed they had over six years of experience in the use of ICT. 35 (81.3) from AA University revealed they had experience over six years of experience, 24 (70.5%) said they have had over six years of experience with the use of ICT and 17(62.9) have had over six years' experience. According to (Chen, 2012) and (Afolabi, Abidoye, & Afolabi 2013), many library users require knowledge of ICT. To meet this challenge, libraries and librarians can help make ICT knowledge available by creating electronic learning center within the libraries. Such creation will go a long way to help users whose are handicapped in the use of ICT.

However, there are instances where there is resistance to new technology by staff in an organization and therefore would not want to use the system or technology. According to Spacey et al., (2003), "A key variable in determining acceptance of new technology seems to be whether users have control over the decision of whether and when to use it". Staff may have to handle the introduction of new library systems and use them to serve customers at the same time as they themselves are learning how to operate the system".

5.6 Ease of use of library resources

To ascertain whether the library ICT system in the libraries was easy to use. The respondents from AA University agreed that the system was easy to use. Respondents from BB University also agreed that the system was easy to use, and respondents from CC also agreed with the question that their library ICT system was easy to use. The responses prove that the library ICT system were easy to use and when a library's ICT system is easy to use the students will be willing to use it. This supports Khan & Qutab, (2016), assertion that digital libraries, enhance performance, users' acceptance always impedes their utilization. It indicates that users' adoption intentions are significant constructs in the success or failure of a digital library. The technology acceptance model (TAM) specifies the causal relationships between system design features, perceived usefulness, perceived ease of use, attitude toward using, and actual usage behaviour.

5.7 Usefulness of Libraries ICT Resources

Regarding the usefulness of ICT resources, both librarians and students agreed that the library ICT system in their institution was useful.

5.7.1 Satisfaction with Resources Provided by the University Library

To find out whether respondents are satisfied with resources provided by their university library. The responses from AA University. 34 respondents representing (79.0%) revealed they were satisfied with the library resources.

The findings from BB University revealed that 31 representing (91.0%) said they are satisfied with their library resources and response from CC University revealed that 25 (85.7%) of respondents said they were satisfied with the resources they receive from their university's library.

This showed that private university libraries were well equipped with e-resources. it also meant that clients of the various libraries were satisfied with the facilities they have at the libraries.

According to Haruna, Kiran, & Tahira, (2017), the greatest goal of every library is to maintain library user loyalty because loyal library users provide word-of-mouth and referrals to the library, thus, increasing patronage and use. A substantial justification for the interest in service quality outcome by practitioners is that it has a beneficial influence on the bottom-line performance for the organization and creates a better understanding of the influence of service quality, user satisfaction and service value. This helps library management to develop a model which maintains user loyalty.

5.7.2 Usefulness of libraries ICT resources

Perceived Usefulness (PU) and Perceived Ease of Use (PEU). Perceived Usefulness is defined as the potential user's subjective likelihood that the use of a certain system will improve his/her action (Davis, 1989). According to Befus & Byrne, (2011), information professionals have seen a change in student behaviours both at the reference desk and in instruction sessions. The ICT has boosted student's confidence level in their research capabilities, increasing the demand for information literacy. Students are now used to online learning, not only because of the shift in higher education to online coursework, but also because they have been learning online at home through YouTube, social media, and other websites. On the issue of whether respondents find the library ICT system useful. Majority of the respondents agreed that the system provided useful information.

5.7.3 Adequacy of Technical Support Available for the Libraries.

McCue, (1994), asserted that the role of technical services within the organizational structure centers on the provision of information. First, technical services staff manage the acquisitions process, including ordering and receiving material and monitoring contractual obligations. Second, they facilitate retrieval by providing access points to resources, by linking related entities and by maintaining the integrity of the database. In the traditional model of technical services, these core responsibilities were handled by staff who were familiar with 1) the vendor community that supplied library materials, 2) the successive iterations of library management software, which allowed staff to track processing steps, and 3) the intricacies of the national standards for providing bibliographic descriptions and access.

The HL and paraprofessionals were asked to indicate whether the technical support available for the libraries when they have challenges were adequate. All three HL indicated that they have adequate technical support from the technical department whenever they encounter challenges with ICT equipment. Paraprofessionals indicated that, PPAA 1and 2 and PPCC revealed that they have adequate technical support and PPBB respondents said they have moderate technical support.

5.7.4 Success of ICT Adoption in Library

According to Adeyoyin, (2006), in West Africa, a good number of university libraries have adopted and are adopting the use of ICT in the handling of their information storage, processing, and retrieval among other things. This paper therefore is aimed at revealing the ICT literacy level among the staff of these West African university libraries. This study becomes imperative since the knowledgebase of these library personnel stands to make or mar the success of ICT equipment usage in their respective libraries of operation.

The respondents indicated that they had a very high success rate with adoption of ICT in their various libraries. This also means that private universities are also keen in adopting ICT in their libraries. To find out the level of success of the ICT system the researcher wanted to find out from the students the reliability of the system and the responses are that adoption of ICT in the private universities is very successful. This can be seen in the responses for the following questions posed to student respondents.

5.7.5 Reliability of ICT System

On the question on whether the system operates reliably the responses from AA Universities were that 40 (93.0%) of respondents agreed that the library information system operated reliably

The responses from BB University indicated that 31 (91.1%) of respondents said they agreed that their information system operated reliably. However, the responses from CC University 25 (92.5%) of respondent agreed that their ICT system operated reliably. The responses showed that most students were satisfied with their library system. The reliability of the system will determine if the students would like to use it or not. It would also help them to determine whether the system is useful or not.

5.7.6 Library ICT systems benefit.

To ascertain whether the library ICT system is beneficial, all respondents indicated that their University ICT system is beneficial. This rated hundred percent "Yes" response from all respondents. Response from AA was forty-three 43 this represents hundred percent yes response rate. All respondents from BB responded yes to the question that, their ICT system was beneficial. The same yes response was recorded from CC university. According to Madhusudhan, (2010), quality education and faculty is impossible without a quality library. One of the fundamental ways

of improving the quality of research work is to facilitate and support the processes of creating, accessing, and using information and knowledge. Benefits of the system is in line with satisfaction of the system. Esse, (2016), the availability of resources can have a significant influence user satisfaction. It is important to note, however, that the quality of the resources may be judged from an overall perception as to whether the library can provide access to materials when and where needed. It is this overall perception of a library resources that contributes to user satisfaction.

5.8 Chapter summary

The discussions of findings were done in reference to the objective of the study. It came out from the discussion that the private universities have adopted to information and communication technology very well. There were similarities in terms of the level of adoption to ICT in the selected libraries.

The results of the survey revealed that most library staff were knowledgeable and willing to use technological equipment to do their work. Even though some staff members admitted to receiving training in ICT, some also indicated they did not get any training from their institution. While those who had training agreed that the training was very effective.

Results from the students survey also revealed that most students were knowledgeable in the use of ICT. They survey also revealed that they are satisfied with the ICT resources they receive at the various libraries, they also indicated that the ICT resources are beneficial and very useful to them. With regards to infrastructure, the staff members revealed that the libraries have adequate infrastructure, but they indicated that, the infrastructure in the library needs to be improved.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

Information communication technology in the library has come to revolutionized the activities and operations of both library staff and user as a whole and therefore the adoption and use of ICT in libraries has become very necessary for the growth and development of any academic institution be it public of private. The library is a place where students, lecturers and researchers acquire information for their use. For this reason, the library is the first place to be given attention for the institution to function well. However, for a library to function well, it needed to be fully equipped with the needed ICT resources for the people for which it was built to fully utilize it.

This chapter was the concluding chapter of the study. The chapter presented the summary of key finding, conclusion of the study, recommendation and lessons for policy recommendation and future research. The study looked at the adoption and use of information and communication technology in selected private universities in Ghana.

To be able to achieve the purpose of the study a sequential explanatory design was used to enable the researcher collect data from the respondents. In all one hundred and twenty-seven (127) participants were drawn from the three selected private universities. The participants in the study were librarians, paraprofessional staff, and students. The reason for choosing these categories of respondents was that these categories of staff employed the use of ICT in their daily work. The students were also chosen because they were the users of the library ICT resource to conduct research. The researcher administered and collected data personally through semi-structured questionnaire and online questionnaire with google forms and mails. Quantitative data was

analysed using the statistical package for social sciences SPSS version 20. Responses from the survey with library staff were analysed using the process of content analysis.

6.2 Summary of the Study

The major findings of the study examined the level of adoption and use of information communication technology in private university libraries and looked at the commitment of managers of private universities towards the adoption of ICT in their various libraries. Additionally, the study looked at the knowledge and competence of library staff who are the custodians of the libraries in the use of ICT and in promoting the use of ICT to their users. Again, the study examined the physical infrastructure in the libraries and to ascertain the usefulness of these facilities in promoting ICT use. A summary of the major findings of the study were presented below as follows.

6.2.1 Demographic characteristics of respondents

The gender distribution of respondents among the library staff was 5 females and 3 males and the distribution of gender among the student's respondents was (71) males and (33) females. Librarians were between the age range of forty (40) to sixty (60) while paraprofessionals were between the age range of 30 - 49 years. Majority of the students age range was also between 29-40 years. Library staff respondents had work experience between 5-15 years.

6.2.2 Level of ICT adoption in the library

The study sought to find out the level of ICT adoption of the three selected private universities. From the responses, it was revealed that the three private universities under studied had a high level of adoption in ICT. However, the students were asked to indicate their personal knowledge

about ICT usage and the responses showed a high level of knowledge in ICT. Head librarians indicated they use ICT for mainly processing of library materials, for circulation and acquisition. The students were asked where they usually use the library resources and the responses indicated that, most of them use library resources in the library. Head librarians revealed that adoption has greatly improved quality of service delivery in their libraries.

6.2.3 Managements attitude and commitment towards the use of ICT in library

For academic library to function well it will need all the support from management to provide the needs of the library. Since librarians oversee the operations of the various libraries the study sought to investigate whether management give them the support they need for them to function well and the findings indicated that they get all the support they need from management. But librarians added that they do not get any motivation or reward for exhibiting excellence or innovation with the use of ICT in their daily routine.

6.2.4 Knowledge and skill of library staff and students

The study sought to investigate the knowledge and skill in the use of ICT by library staff and student and the results indicated that librarians are not afraid to use ICT in their daily routine. Library staff rather showed a positive attitude toward the use of ICT. This positive attitude by the library staff resulted in majority of students accepting to use the library resources for their research. However, librarians indicated they have little knowledge in ICT installations but have great knowledge in ICT applications like software applications, Microsoft office and barcode technology. Some library staff also indicated they had training from their institutions, but others did not get training for some time now. Those who had training said it was very effective. The students also indicated they have over six years' experience in ICT use.

6.2.5 Ease of Use of Library Resources

To ascertain the ease of use of the library system, the students indicated that the ICT system is easy, reliable, and very useful for their research needs. The students again indicated they derive maximum benefit from the use of ICT resources in their various libraries.

6.2.6 Assessment of the Three Private University Libraries

The three universities under study in this research were, Wisconsin International University College, Central University and Methodist University. These three universities were chosen because they some of the few private universities offering Master of Business Administration (MBA) programs in Ghana. And they were some of the oldest universities with well-established libraries attached to them. The study has shown that the three libraries have well adopted to the use of ICT in their operations.

All the library staff who took part in the study exhibited good knowledge of ICT use even though their level of knowledge was not the same. Library staffs from Wisconsin and central have had some amount of training in the use of ICT recently but those from Methodist indicated it has been a while since they had any training.

The research established that the three libraries had good ICT infrastructure both hardware and software infrastructure. In terms of how to use internet applications all the library staff are very good at that, but the fact was also established that most library staff do not have knowledge in installation of ICT infrastructure as a result they have to rely on the external help from the IT department for such services. The findings of the study also established a fact that one of the universities understudied revealed they had not received any training for some time now. The issue

of training of librarians is quite an issue in most libraries these days since the libraries operate on limited funds.

6.3 Conclusion

This study investigated the level of adoption and use of information and communication technology in three selected private university libraries in Ghana, and sought to find out how the ICT resources are being utilized by the students. It was also to ascertain the skill knowledge and competence of both library staff and students in the use of ICT, and how students derive the benefits from the system.

The study had proven that there is a high level of adoption in the three private universities. This is because of total commitment from management who see to the ICT needs of the libraries. It was also established that the library staff who manage the ICT resources are very knowledgeable in the use of ICT and this has resulted in seeing a great number of students using ICT resources in the library. Assessing the students also proved that students are knowledgeable in the use of ICT even though few of them indicated they had additional training from the libraries to be able to use the e-resources in the library. The students also revealed that the resources are very useful and very easy to use and therefore they have shown great satisfaction with the resources they receive from the libraries. The use of ICT has added great value in library activities, and this has satisfied the unique needs of both students, lecturers, and researchers. ICT has brought tremendous change in libraries so much that users of a library do not need to be physically present in the library to be able to use the services of that library.

This study linking to the technology acceptance model had proved that for a system to be fully utilized the users must realize the usefulness and ease of use of the system for them to use it. From the study it was observed that adoption and use of ICT, and the training of library staff in the use of ICT has positively impacted on the life of both library staff and students. Despite the positive outcome of the study there could be great improvement in adopting and using ICT in the libraries since there is continues changes in ICT technology in the world.

6.4 Recommendations

The advent of information communication and technology has brought significant changes in all aspect of human life and the library is not an exception. The use of ICT has become very necessary for libraries to adopt for them to serve their users well. In view of the findings of this research, the following recommendations were made.

6.4.1 Creation of Special Funds for Libraries by Private university managers

There is the need for management of private universities to invest more into the ICT development in their various libraries. By this management can put aside special fund for the development of the libraries, so that the library could easily get funding for their necessities.

6.4.2 Regular Training for Librarians by their institution

The major finding in this research was the issue of training for librarians and library staff. It is recommended that library staff should be given more training in ICT by their institutions, for them to be in a proper position to help students with their daily research needs. Attending workshops and seminars will help librarians feel confident in their line of work and to stay relevant in the library profession since ICT has taken over the library world today.

6.4.3 Training of Systems Librarian as a Course by the Department of Information Studies.

There is the need for the Information Studies Department to factor the training of systems librarians in training students to become librarians. This will help librarians to address the technical challenges they might face in the libraries. There should be an organized body who will oversee the activities of private universities in order to ensure that the libraries adhere to proper library management standard and also to ensure that both library staff and students' interest are safeguarded.

6.4.4 Devoted Space for ICT Facilities in the Library by University management

During this research it was observed that some libraries have small spaces allocated to serve students ICT needs. It is recommended that there should be a devoted space for ICT facilities in the libraries provided by management where students will have the privacy and comfort to use the e-resources.

6.4.5 Collaboration by Librarians and Procurement Department

There is also the issue of librarians not being consulted when acquiring ICT infrastructure for the library, as a result there is always the conflict of the procurement department buying sub-standard goods for the library which does not meet the library's needs. For this reason, there should be a collaboration between the procurement department when purchasing items for the library to derive maximum benefit from new ICT equipment in order not to waste money on sub-standard goods.

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APPENDIX 1: INTERVIEW FOR PROFESSIONAL LIBRARIANS

SCHOOL OF INFORMATION AND COMMUNICATION STUDIES

DEPARTMENT OF INFORMATION STUDIES

UNIVERSITY OF GHANA, LEGON

Dear Sir/Madam,

This interview seeks to elicit information from you and your library staff on the topic "Adoption and use of ICT in academic libraries: a case study of selected private universities in Ghana". This research is in partial fulfilment of the requirements for the award of a Master of Philosophy (MPhil) degree in Information Studies. Your feedback will also help with the development and use of ICT systems in private university libraries in Ghana. I would be very grateful if you could spare a few minutes to answer the questions posed in the interview sincerely and to the best of your ability. Please be assured that your responses to the questions would be kept confidential and would be used solely for academic purpose. Your co-operation is fully appreciated.

Thank you for your time.

Yours sincerely,

……..

(Asmawu Abubakar)

Student/Researcher

Section A: DEMOGRAPHIC DATA

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

2. Age: a) 20-29 years [ ] b) 30-39 years [ ] c) 40-49 years [ ] d) 50-60 years [ ]

3. Current Department/Section/Unit: ……

4. Highest Academic Qualification Attained a) Ph.D. [ ] b) MPhil/Masters [ ] c) BA/BSC [ ] d) Diploma [ ]

5. Institution you are working for

a. Central University

b. Wisconsin University College

c. Methodist University College

6. Designation within the University Library? a) Senior Member [ ] b) Senior Staff [ ] c) Junior Staff [ ]

7. Length of service in the University Library? a) Less than 5 years [ ] b) 6-10 years [ ] c)11-15 years [ ] d) More than 15 years

Section B: Level of ICT adoption in the libraries.

8. what is the level of ICT adoption in your library?

9. In what areas does the library use ICT for its operation?

10. What factors do you consider for the sustainability of ICT based library services in your library?

11. What impact has adoption and usage of ICT brought to the library?

Section C: This section to ascertain how easy the library resources are to users of the library.

12. Have you received training in ICT from your institution over the last three years?

13. How easy is it to use the following ICT resources in your library.

a. Web-based Online Public Access Catalogues (Web-OPAC)

b. Digital Library Service

c. Electronic Document Delivery Service

d. Institutional Repository Service

e. Current Awareness Service (CAS)

f. Audio-Visual Services

14. how easy it is for the students to use library resources?

Section D: Management commitment and support: This section is meant to find out the level of top management commitment and support in adopting and using ICT in your Library.

15. Does management has a very positive perception and attitude towards the use of ICT in your library.

16. Does management motivates and rewards performance of staff who adjust to ICT advancement in your library.

17. Is management quick to address problems and complains that arise from the use of ICT in your library.

Section E: Library staff capabilities: This section is intended to determine library staff perception, knowledge, competencies, and training with regards to the use of ICT.

18. How do you feel when you must use technology relating to your work?

19. how competent are you in the use of both software and hardware packages

20. how are you able to meet students request with the use of ICT?

Section F: usefulness of ICT resources in the library. This section is to ascertain the usefulness or otherwise of the facilities in the library

21. How useful are the ICT resources in the library?

22. do you have the facilities needed to support the use of ICT in your library?

23. How would you rate the level of technical support available for you when you encounter challenges in using ICT equipment?

Section F: RECOMMENDATIONS

24. Please write in the space provided below any suggestions that can lead to an improvement in the adoption and use of ICT in your library.

……

……

……

APPENDIX 2: QUESTIONNAIRE FOR GRADUATE STUDENTS

SCHOOL OF INFORMATION AND COMMUNICATION STUDIES

DEPARTMENT OF INFORMATION STUDIES

UNIVERSITY OF GHANA, LEGON

Dear Respondent,

I am a postgraduate from the department of information and communication studies, university of Ghana. This research is in partial fulfilment of the requirements for the award of a Master of Philosophy (MPhil) degree in Information Studies. As part of the course requirement I am carrying out a research on ``the adoption and use of information and communication technology ICT in academic libraries''. You have been identified as a key respondent in this study and I kindly request you to assist me in filling this questionnaire. All the information collected will be treated with utmost confidentiality and used only for the purpose of this study.

Thank you very much for your time and cooperation.

(Asmawu Abubakar) Student/Researcher

INSTRUCTION: Please, tick [√] the appropriate answer for the close-ended questions and answer the open-ended questions to the best of your knowledge.

Section A: DEMOGRAPHIC DATA

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

2. Age:

a) 20-29 years

b) 30-39 years

c) 40-49 years

d) 50-60 years

3. Current Programme offering: ……

4. in which institution are you currently studying?

a) Central University

b) Wisconsin University College

c) Methodist University College

Part B: Knowledge of ICT Resources

5. what is your level of knowledge about ICT usage.

A) None

b) low

c) Moderate

d) High

e) very high

6. How did you learn to use the library's online services?

a) On my own
b) through training sessions organized by the library
c) from Friends and relatives
d) Through Written instructions.

7. Where do you usually use the electronic resources?

a) In the library

b) In the University ICT center

c) At the cybercafe

d) At home

8. How long do you estimate you have had experience related with information technologies?

a) Less than 2 years

b) 3-4 years

c) 5-6 years

d) Over 6 years

9. Do you have the skills to navigate the digital information landscape

a) yes

b) No

10. Are you satisfied with resources provided by your University library generally?

a) Strongly dissatisfied

b) Dissatisfied

c) Moderate

d) Satisfied

e) Strongly satisfied

11. Overall, do you feel that your University library ICT resources are adequate to support your needs?

a) yes

b) No

Part C: User System Satisfaction

12. Library ICT System Provides me with a complete set of information

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

13. The information provided is clearly presented on the screen

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

14. The information provided is accurate

a) Yes

b) No

15. Is information provided easy to use

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

16. Operates reliably

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

17. Provides readily accessible information

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

18. Library information system can be adapted to meet a variety of needs

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

19. Library information system integrates data from different sources

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

20. Provides information in a timely fashion

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

Part D: Library Information System Usage

21. Primary usage purpose

a) Research

b) Education

c) Work related

d) Personal needs

e) Recreation

22. How often do you use the library ICT system

a) Rarely

b) A few times a year

c) A few times a month

d) A few times a week

e) Daily

23. Is using library ICT system beneficial to you?

Yes

No

APPENDIX 3: QUESTIONNAIRE FOR PARAPROFESSIONALS

SCHOOL OF INFORMATION AND COMMUNICATION STUDIES

DEPARTMENT OF INFORMATION STUDIES

UNIVERSITY OF GHANA, LEGON

Dear Sir/Madam,

This questionnaire seeks to elicit information from you on the "Adoption and use of ICT in academic libraries'': a case study of selected private universities in Ghana. This research is in partial fulfilment of the requirements for the award of a Master of Philosophy (MPhil) degree in Information Studies. Your feedback will also help with the development and use of ICT systems in private universities in Ghana. I would be very grateful if you could spare a few minutes to answer the questions posed in the questionnaire sincerely and to the best of your ability. Please be assured that your responses to the questions would be kept confidential and would be used solely for academic purpose. Your co-operation is fully appreciated.

Thank you for your time.

Yours sincerely,

(Asmawu Abubakar) Student/Researcher

Section A: DEMOGRAPHIC DATA

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

2. Age: a) 20-29 years [ ] b) 30-39 years [ ] c) 40-49 years [ ] d) 50-60 years [ ]

3. Current Department/Section/Unit: ……

4. Institution you are currently working for

a. Central University

b. Wisconsin University College

c. Methodist University College

5. Highest Academic Qualification Attained: a) Ph.D. [ ] b) MPhil/Masters [ ] c) BA/BSC [ ] d) Diploma

6. Designation within the University Library: a) Senior Member [ ] b) Senior Staff [ ] c) Junior Staff [ ]

7. Length of service in the University Library. a) Less than 5 years [ ] b) 6-10 years [ ] c)11-15 years [ ] d) More than 15 years

Section B: Level of ICT adoption in the libraries.

8. what is the level of ICT adoption in your library?

9. In what areas does the library use ICT for its operation?

10. What impact has adoption and usage of ICT brought to the library?

Section C: this section to ascertain how easy the library resources are to users of the library.

11. Have you received training in ICT from your institution over the last three years?

12. How easy is it to use the following ICT resources in your library.

a. Web-based Online Public Access Catalogues (Web-OPAC)

b. Digital Library Service

c. Electronic Document Delivery Service

d. Institutional Repository Service

e. Current Awareness Service (CAS)

f. Audio-Visual Services

Section D: Library staff capabilities: This section is intended to determine library staff perception, knowledge, competencies, and training with regards to the use of ICT.

13. How do you feel when you must use technology relating to your work?

14. do you think technology has added more responsibility to your work?

15. Do you have the knowledge, skill, and competency in the use of software and hardware packages?

Section E: Usefulness of ICT resources in the library. This section is to ascertain the usefulness or otherwise of the facilities in the library.

16. How useful are the ICT resources in the library?

17.does your library have the necessary facilities needed to support the use of ICT.

18. How would you rate the level of technical support available for you when you encounter

Section F: RECOMMENDATIONS

19. Please write in the space provided below any suggestions that can lead to an improvement in the adoption and use of ICT in your library.

……..

…….. ……

APPENDIX 4: INTRODUCTORY LETTER