UNIVERSITY OF CAPE COAST

INFORMATION AND COMMUNICATION TECHNOLOGY DEPLOYMENT AND THE LEVEL OF ACADEMIC LIBRARY AUTOMATION IN UNIVERSITY OF CAPE COAST
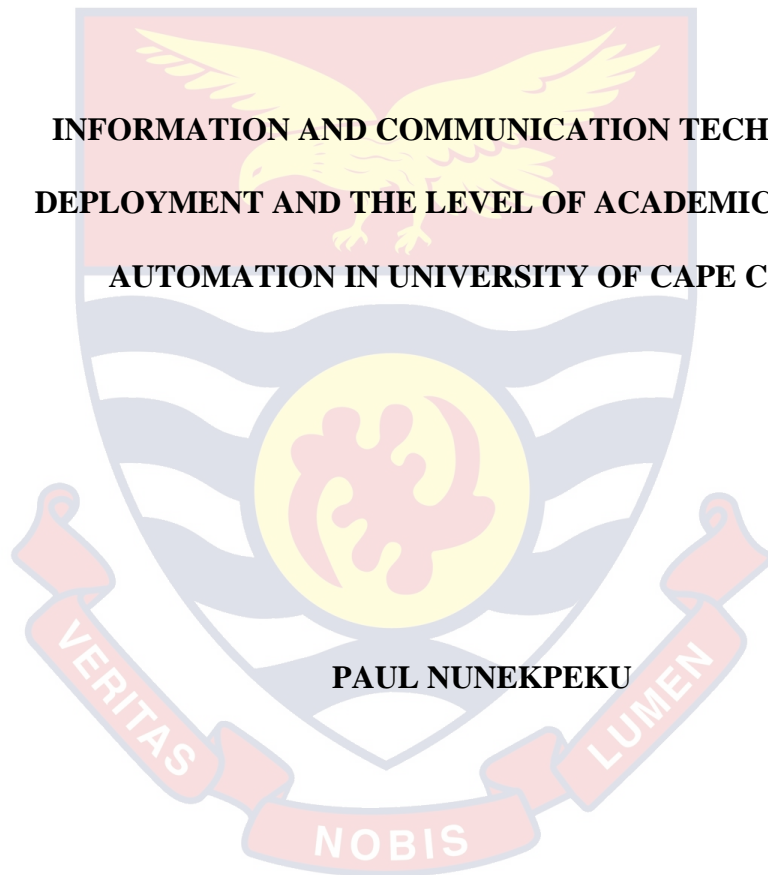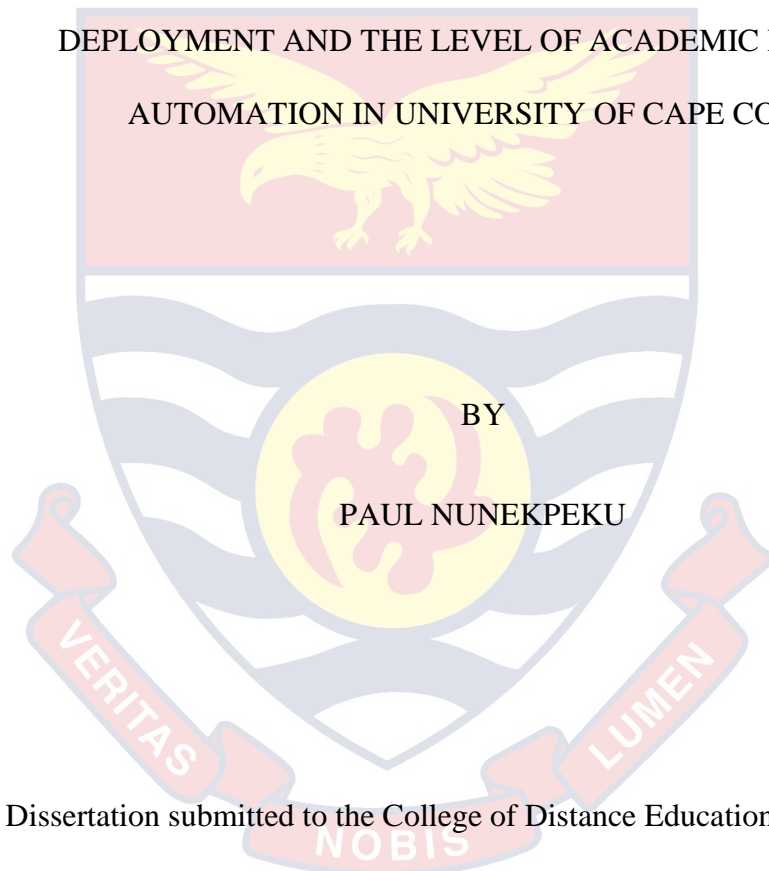
PAUL NUNEKPEKU

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UNIVERSITY OF CAPE COAST

INFORMATION AND COMMUNICATION TECHNOLOGY

DEPLOYMENT AND THE LEVEL OF ACADEMIC LIBRARY

AUTOMATION IN UNIVERSITY OF CAPE COAST

BY

PAUL NUNEKPEKU

Dissertation submitted to the College of Distance Education, University of

Cape Coast, in partial fulfilment of the requirements for award of Master of

Education degree in Information Technology

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: …………………......   Date: …………………..

Name: …………………………………...

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature: …………………......   Date: …………………

Name: …………………………………

ABSTRACT

The main objective of this study was to assess the Information and Communication Technology deployment and the level of academic library automation in University of Cape Coast. A mixed research method design was used. The study was limited to one academic library namely, Sam Jonah Library of the University of Cape Coast. A total sample size of 419 respondents was used, consisting of 97 staff and 322 clients who use the Sam Jonah library facilities. Purposive sampling and disproportionate stratified random sampling were adopted to select the staff and the clients respectively. The main data collection instrument was a questionnaire. However, an informal interview was also used to collect primary data. SPSS software version 21 was used to analyse collected data using both descriptive and inferential statistics. The major findings were that the ICT resources used in the automation of Sam Jonah library were inadequate or low to meet the demands of the clients. Thus, availability of ICT resources was found to predict the level of academic library automation. Also, Internet connectivity was crucial in the operations of Sam Jonah library and was found to predict the use of academic library automation. Lastly, the study found a positive correlation between ICT training of staff and the level of academic library automation. Recommendations to the study were acquisition of more ICT resources, securing a bigger bandwidth for faster Internet speed and recruiting ICT experts or upgrading some existing staff skills through professional ICT training in the library automation software.

KEYWORDS

Academic Library

Information and Communication Technology (ICT)
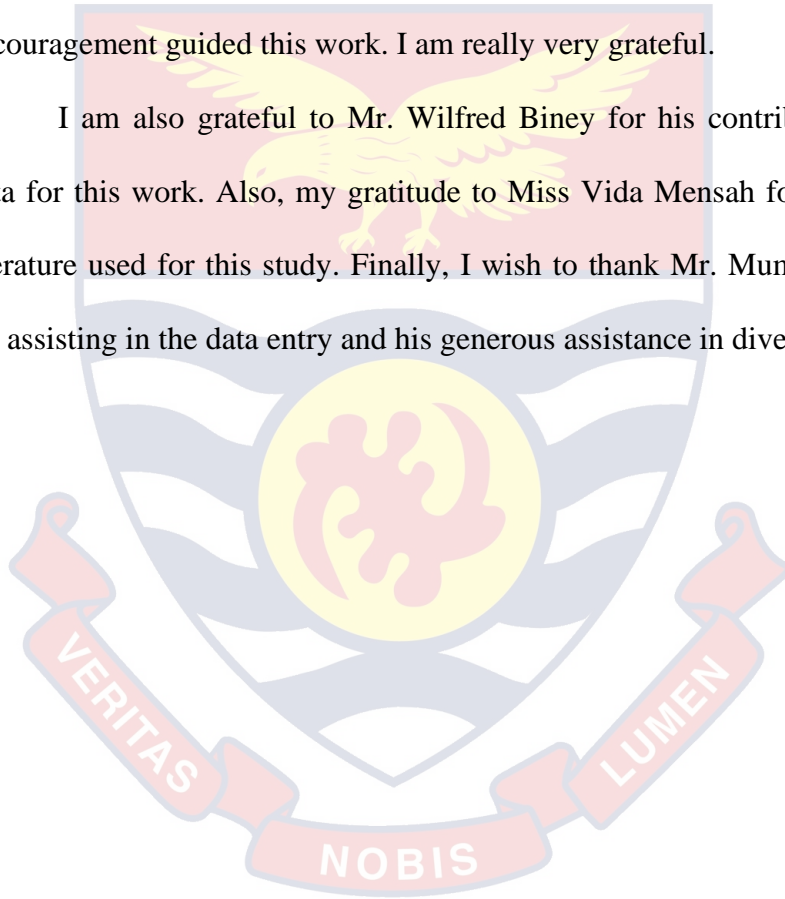
ICT Resources

Library Automation

Sam Jonah Library

Sustainable Development

ACKNOWLEDGEMENTS

DEDICATION

To my parents, Mr. Emmanuel Nunekpeku and Madam Dorothy Acheampong

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CHAPTER ONE

INTRODUCTION

Background to the Study

Rapid changes in technology globally have impacted on the effective delivery of services by academic libraries. New technological methodologies have, therefore, been employed in scholarly communications, developing virtual space for libraries through research commons, increase of social media, growth of mobile devices such as smart phones and tablets with their associated applications; have collectively transformed the traditional academic libraries. So long as technology will continue to influence the delivery of information services, traditional academic libraries will have to accept the idea of employing technologies in digital library systems for their effective operations. According to Choi and Rasmussen (2009), academic libraries have moved from concentrating on management of physical resources and its associated services to changing resources and services into digital forms to support teaching, learning and research. Academic libraries would, therefore, have to make use of modern Information and Communication Technology (ICT) to expedite better access to local and global information (Kavulya, 2004).

The dawn of Information and Communication Technology has brought about a movement in the way academic libraries operate. Odero-Musakali and Mutula (2007) have indicated that the proliferation of new technologies bring about new challenges which require new ways of doing things. Among several technologies integrated in the library automation include, the Koha software

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(open source) for managing library materials and services, Online Public Access Catalogue (OPAC) for locating library materials, D-Space for institutional repository, and Radio-frequency identification (RFID) for book protection against theft. According to Spacey, Goulding, and Murray (2003), library clients may sometimes find it difficult or will not be comfortable with new technologies either in accessing information or in using the library. They further stated that the understanding of how and why clients either accept or reject new technologies is paramount to the effective integration of any new technology into an organization's functions. This connotes that the successful use of ICT depends not only on the technology itself, but also on the levels of skills and expertise of the individuals using the technology.

For the past two decades, academic libraries have been affected by the transformations brought about by information and communication technology. The academic library environment will, therefore, continually be in a state of transition in terms of resources and clients. Krubu and Osawaru (2011) predicted that the changes seen in academic libraries in recent times will still be accelerating and that this climate of transition and change in academic libraries all over the world is due to information and communications technology applications. The emergence of modern Information and Communications Technology leaves unprecedented impacts on the operation of academic libraries.

The integration of Information and Communication Technology in academic libraries has become necessary because of new methods used for teaching, learning and conducting studies in the higher institutions of education.

Application of technology to teaching and learning has over the years taken different forms, which has evolved in terminologies use to describe the various forms of education such as distance learning, e-learning, or on-line learning. For instance, the Internet has become a common technology tool used by both students and lecturers. A good academic library is one that effectively provides adequate and timely information in support of the teaching, learning and research activities of faculty members, researchers, scholars, and both undergraduate and post-graduate students of higher institutions of education. According to Afolabi and Abidoye (2011), they posited that although the primary functions and objectives of libraries have not changed per se over several decades, the methods and materials used in delivering the services have changed. Many information resources which were once available in only print formats are now available in several formats which include information on compact disc (CD-ROM), online databases, Internet, etc. Rosenberg (2005) asserted that there have been significant transformations from paper-based information to electronic access to information and knowledge. Academic libraries have always been repositories of resources to support teaching, learning, and research. Thus, they play a significant role in every institution of higher education such as the universities and colleges.

Information and communication technology deployment in academic libraries has the ability to impact the sustainable development of libraries. Some research studies conducted have explored the state and availability of Information and Communication Technology in academic libraries, the provision of support especially in Africa for the deployment of ICT in libraries, and the impact of ICT

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on library service delivery. Nok (2006) researched into the computerization of Kashim Ibrahim Library of Ahmadu Bello University in Nigeria, and discussed the problems faced in the computerization of the library. In a study conducted by Makori (2009), he indicated that technological innovation was not well grounded in academic libraries in Kenya but however mentioned some few academic libraries such as United States International University (USIU) Library and the Catholic University of Eastern Africa (CUEA) Library among others, which had already integrated the necessary technologies and recommended the need for academic libraries in Kenya to integrate ICT solutions into their mainstream information services. In Ghana, Amekuedee (2005) conducted a research to evaluate the library automation in three public universities to determine the application of information and communication technologies available among these university libraries in the provision of services. The study revealed that although the academic libraries recognize the relevance of library automation, they were held back due to lack of funds, lack of skilled staff, and lack of support from the university administrations to set sail on automation of all library processes.

Various donors and organisations over the years have supported institutions of higher learning and their libraries with the needed resources to facilitate the implementation of ICT. For example, Kenya Education Network (KENET) provided Kenyain universities with affordable and efficient bandwidth to setup a more cost effective and sustainable network which offers high-speed access to the Internet (Makori, 2009). The Electronic Information for Libraries

(EIFL) and the International Network for the Availability of Scientific Publication (INASP) have for many years been supporting librarians from institutions of higher learning to boost their capacity in the provision of information in this digital age (Kashorda, 2010).

Statement of the Problem

Information and Communication Technology has become the key to the accomplishment of modernizing the services of academic libraries. The integration of ICT influences every activity of academic libraries to a great extent in providing opportunity for value-added information services. Academic libraries with ICT integration provide access to unlimited electronic information resources to their clients. Academic libraries of today use Information and Communication Technology to automate their main operations for client satisfaction. The automation involves the implementation of proficient and operative electronic library services, digitized institutional repositories, networked resource sharing, and management information systems.

The Sam Jonah library of University of Cape Coast has in recent times employed new technologies in automating its services. This innovative use of Information and Communication Technology is not widespread. Several studies done by Okon, Ani, and Nkoyo (2005), Mohsenzadeh and Isfandyari-Moghaddam (2009), Kumar and Biradar (2010), and Mingle (2014), just to mention a few, looked into the use of ICT in academic libraries but have failed to assess the influence of ICT deployment on the sustainable development of academic libraries. It is against this back drop that this study seeks to assess the ICT

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deployment and the level of academic library automation of the University of Cape Coast. The choice of the study area was due to the fact that the researcher identified the above problem in the location and wants to investigate into it.

Purpose of the Study

The purpose of the study was to assess the Information and Communication Technology deployment and level of academic library automation of University of Cape Coast.

Research Objectives

The specific objectives that helped achieve the main objective are:

1. Explore the availability of ICT resources and the level of Sam Jonah library automation.
2. Assess the effect of Internet connectivity on the usage of Sam Jonah library automation.
3. Ascertain the ICT training of Sam Jonah library staff on the level of academic library automation.
4. Assess the perception of library staff regarding automation of Sam Jonah library.
5. Determine the perception of clients regarding their level of satisfaction of the automation of Sam Jonah library.

Research Hypotheses

The study was guided by the following research hypotheses:

1. H_0: There is no relationship between availability of ICT resources and the level of Sam Jonah library automation.

2. H_0: Availability of Internet connectivity cannot predict the use of Sam Jonah library automation.

3. H_0: ICT training of Sam Jonah library staff cannot predict the level of academic library automation.

4. H_0: There is no difference in Sam Jonah library staff perception on academic library automation.

5. H_0: There is no difference in client satisfaction of Sam Jonah library automation services.

Significance of the Study

The study provides insight into the state of ICT deployment in Sam Jonah library of University of Cape Coast. Secondly, it serves as a guide for policy-makers in making decisions as to the improvement of ICT infrastructure in the library for the delivery of effective and efficient services in the provision of quality academic information. Lastly, the study adds to the available literature regarding the adoption of ICT in libraries.

Delimitation

This study could have covered all academic libraries in Ghana. However, the study focused only on Sam Jonah library of the University of Cape Coast.

Limitations

Some of the selected respondents to the questionnaire were difficult to

come by but were later replaced. Also, the conclusions and recommendations of the study may not be applicable to all academic libraries in Ghana. Therefore, any attempt to generalise should be done with caution.

Organization of the Study

The study was organized into five main chapters. The first chapter dealt with the introduction/background to the study, statement of the problem, purpose of the study, research objectives, research hypotheses, significance of the study, delimitation and limitations of the study.

The second chapter reviewed related literature, books, and journal articles of the subject matter. It included a review of relevant theories and concepts in ICT, library automation, academic libraries, sustainable development and a proposed conceptual framework for the study.

The third chapter focused on the methodology which consisted of the research design, the study area, target population, sampling technique, sample size, data collection instrument and data analysis plan.

The fourth chapter examined and discussed the results of major findings from the collected data with reference to literature reviewed.

The fifth chapter presented the summary of the results of the study, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Overview

This chapter reviews available literature related to the study. It also provides the understanding and insight into the development of a proposed conceptual framework for ICT deployment for sustainable development of automated academic library. This chapter identifies, criticizes, compares and contrasts existing studies in terms of theories, models and empirical data.

Technology Acceptance Model

Technology Acceptance Model (TAM) is a model founded by Fred Davis in 1989. This model is used to assess people acceptance and usage or acceptance and implementation of any technology in an institution. It determines the factors that make an individual to either accept or reject an emerging technology and use it. According to Davis (1989), these factors are the perceived usefulness of the technology and perceived ease of use of the technology. He further explained perceived usefulness of technology to mean the level of believe that one has that the use of a particular technology will increase or improve one's performance of work. In other words, the technology is useful in meeting the needs of the user. On the other hand, perceived ease of use of technology meant the level of believe that one has such that a particular technology is easy to use. This model is adopted by the researcher for this study because for an academic library to have developmental sustenance to be relevant in today's information world, it must employ the use of ICT in the provision of its services for client satisfaction. Thus,

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the particular ICT to adopt will be determined by the perceived usefulness and perceived ease of use by the library and staff.

Conceptual Framework

The proposed conceptual framework of this study was developed from the review of theories/concepts and empirical literature of scholars in relation to the topic. The components considered in this framework are, therefore, guided by the reviewed literature of this study. Hence, this framework is ideal for this study as it provides the various parameters that characterize ICT deployment for a sustainable academic library.

ICT
- Integrated library software
- Appropriate hardware/facilities for automation
- Electronic resources
- Internet

Support System
- University Management/ Sponsorship
- Adequate Funds
- Automation Policy/Guidelines
- Library Staff readiness
- Trained Library Staff
- IT team/Support
- Standby Power supply
- User education

Traditional Academic Library

Sustainable Automated Academic Library

Figure 1: Conceptual Framework of ICT Deployment for Sustainable Automated Academic Library

Source: Author's Construct (2017)

For a traditional academic library to become a sustainable automated academic library that is flexible to accommodate future changes, as well as, to

continue to provide efficient services and quality information, the library must consider acquiring the ICT resources needed for the automation project. This can be achieved through the preparation of needs analysis. The ICT resources may include integrated library software, local area network (LAN), Internet, appropriate and durable hardware such as computers, printers, and other electronic resources. It is important that the usefulness and the ease of use of any technology (hardware and software) being adopted for automation must be considered despite other factors that one might also consider such as cost of technology among others.

The library needs the support of the University management as the backbone in becoming a sustainable automated academic library. An academic library must have adequate funding from the university or sponsorship from donor agencies to support the automation project of the library. The university management is the final decision-making body that take into consideration the needs and budget of the library. Also, there is the need of an automation policy to guide the library automation project to ensure the successful implementation of the project. The policy should also specify relevant issues regarding usage. Since the human resource of an organization is vital for the achievement of any organization's goals, the readiness of the library staff is required to accept the technological and structural changes that might take place due to the automation project. The staff readiness will require training of library staff on how to operate or use the adopted automation software, ICT tools or technologies employed in

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the automation project. The library staff need to be trained as and when necessary to ensure that they are always abreast with issues regarding the automation.

The creation of IT team or support unit made up of experts is crucial for the maintenance of the automation. This support unit/IT team should be responsible for fixing bugs (errors) in the system as and when these errors develop over time. They should also be responsible for system upgrades as and when necessary to accommodate future needs. The provision of a standby power supply must be in place to avoid the halt of library operations due to light off especially in some African countries like Ghana and Nigeria where there is no stable electricity supply. Lastly, user education by the academic library is very important to create the awareness for maximum use of the services provided by the automated library.

Concept and Definition of ICT

Information and Communication Technology elaborates the relevance of communication in data handling. Thus, it deals with how technology is employed to access and disseminate information. ICT integrates information technology (IT) to provide easy access to information through several communication technologies such as Internet, cell phones, audio/video conferencing, and wireless networks (Tamilsel, Sivakumar, & Sevukan, 2012). Information Technology may, therefore, be looked at in the broader sense to embrace all aspects of computing technology. According to Womboh and Abba (2008), ICT and IT are synonymous concepts despite the fact that there is a difference between them. The researcher

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will, therefore, embrace both concepts and used them interchangeably for the study.

Several scholars have defined ICT from different perspectives. However, all the definitions have some common grounds which has to do with employing technologies in accessing, manipulating and communicating data. For example, Garai (2005) defined ICT to include provision of Internet service, media, broadcasting, network-based information services, and any activity associated with information and communication. According to Oluwaronbi (2012), ICT is any electronic based technology generally used to retrieve, store, process and package information as well as provide access to knowledge. Imhonopi and Urim (2012) further looked at ICT as hardware and software technologies that facilitate data gathering, data processing, transmission and storage to connect individuals and institutions around the world. A more recent definition of ICT is "the use and application of computers, telecommunications, and microelectronics in the acquisition, storage, retrieval, transfer and dissemination of information to a wider and dispersed audience" (Aina, Okunnu, and Dapo-Asaju, 2014). From the above definitions, ICT encompasses a wide range of things including acquisition, processing, storage, and information dissemination through the usage of designed software and hardware without restricting it to only computers but also telecommunication equipment.

The American Library Association glossary defined information technology from the perspective of library information science to be the use of computers and other technologies in acquiring, storing, organizing and

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disseminating information (Levine-Clark & Carter, 2013). This definition is however much applicable to libraries as it focuses on the use of computers and other technologies in carrying out the key operations in the library. ICT applications are widely used in different areas such as in business, health care, manufacturing, libraries, and education just to mention a few. Imhonopi and Urim (2014) have stated that the appearance of ICT has provided quick and better ways to communicate and use information. The relevance of ICT, therefore, depends not only on the technology itself but mostly on the application or the ability of the technology being used in accessing information or in communicating the information.

Concept of Sustainable Development

The term sustainable development has been defined by several scholars. However, the most often used definition is that of the one published in a report by the World Commission on Environment and Development (WCED) of the United Nations, which was commonly known as the Brundtland commission report. Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). This wide definition adopted in this study does not disregard the different perspectives of sustainable development in any way. It should, however, be noted that the proponents of sustainable development argued that sustainability needs should be seen as an integrated approach (Kendie and Martens, 2008). Sustainability as defined by Kuhlman and Farrington (2010) is "maintaining well-being over a long, perhaps even an indefinite period." Thus,

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sustainability deals with how to maintain changes over time under whatever conditions (Batchelor and Norrish, 2005).

Sustainable development is seen to be based on three key areas of development, which are economic, social and environment. These developmental areas are described by Elkington (1994) as the triple bottom line concept of sustainability. According to Kuhlman and Farrington (2010), these three dimensional stems of sustainability are "integrated, mutually supportive, interdependent and reinforcing pillars for long-term development." According to Stoddart (2011), intergenerational equity is a common concern contained in the various definitions of sustainable development. The recognition of this long-term goal takes into consideration the needs of future generations. One of the key principles that differentiate sustainable development from other forms of development is the conservation of resources for future generations (Emas, 2015). Thus, the main goal of sustainability is the long-term soundness of an environment, economy or society irrespective of the changes that take place.

The United Nations 2030 Agenda for Development (UN-DESA, 2017) included the seventeen sustainable development goals. However, the fourth sustainable development goal deals with ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. This is where the library comes in. Libraries are institutions that play key role in the development of society. They guarantee access to quality information that supports the establishment of knowledge societies, as well as, opportunities for people to use information and preserve access to information for future generations (Lyon

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declaration, 2014). As societies and their environments change, technology also changes with time. Automated Academic libraries must therefore deploy more ICT in their operations in order to provide infrastructure for easy access, effective use and preservation of information for future generations.

Academic Libraries

Academic libraries are those libraries located in institutions of higher learning mainly universities, colleges, and polytechnics. They play a key role in institutions of higher learning. They serve the curricular needs of students and also support the research needs of institutions of higher learning (Akporhonor, 2005). Kyrillidou (2008) has indicated that libraries are reserves of masterminds; therefore there is no great university in the world without a great library. Thus, an academic library is the most relevant resource center of any academic institution of higher learning (Emwanta, 2012). According to Akpan-Atata, Akwang, Akai, and Eyene (2015), the main function of academic libraries is to serve as the backbone for teaching and learning, as well as, research activities to support the institution's vision and mission.

Academic libraries provide information services to the users who are mainly lecturers, researchers, staff, and students (undergraduate and post-graduate) of the institution. There are other several services offered by academic libraries, which include reference services, lending services, inter-library lending and document delivery (ILL/DD), electronic support and reprographic services, and user education (Opare-Adzobu, Afful-Arthur, Laryea, and Filson, 2014). In the most recent times, academic libraries are seen as mediums for information

dissemination, developing intellectual compatibilities for enhancing literature searches and promoting cultural and social values (Omeluzor & Oyovwe-Tinuoye, 2016).

Brief History of the University Library Automation

The main library of the University of Cape Coast began the automation of its operations in the year 2000. When this initiative begun, the cataloging section of the library was the first to be automated using the software called BiblioFile. This eased the cataloging processing of library books. The BiblioFile is a commercial library software, which was subscribed yearly. However, in the year 2005, the library management decided to use a more integrated system and therefore employed the use of the software known as Alexandra. This software was not used for long because the library needed a more robust system. From the year 2007 till date, the University Library has been using Koha for its operation. The University library is now known as Sam Jonah library since September 2016 (Vice-Chancellor's Annual Report, 2016).

Library Automation Softwares

The choice of a suitable software package for automation of academic libraries is vital. It is an obvious fact that there is no software that is hundred percent efficient. This is to say that every integrated library software may have some negative impact on the efficiency of a library because of the particular software being used by the library. The library management or Librarian, however, need to have a better understanding of the particular needs of the library to ensure the right selection of a library automation software. The knowledge

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about the needs of the library will not only help in selecting a suitable software package for the automation but also help in selecting the appropriate hardware since hardware depends on the software design and complexity. There are several integrated library software packages used in the automation of academic libraries to provide efficient services to clients. Several scholars such as Patel and Bhargava (1995), Joes (1997), Airy (1999), Shrestha (2000), Aryal (2005), Mandal and Jeevan (2006) have done extensive research on the use of some of these library automation software like LibSys, SLIM21, PhpMyLibrary, AFW, OpenBiblio, Millenium, Alice, SLIM, Koha, EASYLIB, SOUL, Sierra, CDS/ISIS, SLIM++, WINISIS, etc. These integrated library management packages are either commercial or free and open source software. According to Adeyoyin & Wallis (2005), a good number of academic libraries in West Africa have adopted the use of library automation software in the handling of their information acquisition, storage, processing, and retrieval. However, Kumar & Jasimudeen (2012) asserted in their research that the adoption rate of open source library management software in India was slow.

Koha

Koha is a fully featured integrated library software. Koha is the world's first free open source library management system, which was released on 6th September 1999 (Kumar & Jasimudeen, 2012). Free and open source softwares are those free programs which are available with their source codes without any cost, and also respect the users' right and freedom. The users of free and open source softwares have the freedom to install, duplicate, share, study, and make

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changes to improve the software. Once Koha is installed, one can access it using the server's IP address on the local area network (LAN). Thus, some modules or functionalities in the software can be used without Internet connectivity (Kumar & Jasimudeen, 2012). However, Koha requires Internet to access its web online catalogue (OPAC), catalogue books using the Z39 and also for purchasing books online.

The Koha software has users' community which is made up of different library types and sizes, volunteers and organizations from around the world who maintain the software development. It can also be easily updated to fix errors as the user community always work together to fix errors encountered. For instance, in May 2017, four versions were released: Koha 17.05 (31st May), Koha 16.05.13 (24th May), Koha 3.22.21 (22nd May); and Koha 16.11.08 (22nd May) (Koha, 2017). It must, however, be noted that any library that deploys Koha for the automation of its operation must have a Linux expert or employ the commercial services of one skilled in the use of Linux operating system. Koha provides detailed user manuals, as well as, maintains online user manuals through the Koha community. Procedures for installation, assistance for data migration, discussion forums and blogs which are useful for librarians are readily available. Furthermore, it should be noted that for any sustainable automation of an integrated library system, one must consider a software that uses a standard Machine-Readable Cataloging (MARC) for easy migration of data. This, however, positions the library to easily upgrade its system to meet emerging technologies and also meet the demands of clients for the provision of client

satisfaction services.   Also, an integrated library system must have a good maintenance support for easy updates since systems develop bugs (errors) over time (Lehman, 1980).

Koha's web interface is easy to use by both librarians and patrons. It has added web 2.0 features to enhance patrons' experience. Libraries can change the web layout and outlook to match the theme of their organizations. Layouts allow the addition of links for social network and book marking. Koha uses MARC 21 and UNIMARC standard framework for cataloging. It uses Z39.50 for downloading the cataloging details of the books from remote library servers such as the Library of Congress. The circulation module in Koha is the most favorite module by its users (Kumar & Jasimudeen, 2012). The Koha circulation process consumes less time and also provides ease in completing any circulation transaction. Koha's Online Public Access Catalogue (OPAC), is designed to provide access to materials available in a library; provide multipoint access to literature; tell about which library books have been lent and which ones are in the stock of the library; and also provide public access to the collections of a library to work stations of scholars, researchers, lecturers and other interested clients at their own comfort without being present physically in the library (Gopinath, 1995). This in a way markets the library services because clients can make requests or place holdings on library materials from their homes and offices.

The Koha software among many others is suitable for automating academic libraries especially for academic libraries in Africa. Many academic libraries with limited funded or financial support can begin with the use of Koha

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for their library automation. Corrado (2005) and Chudnov (1999) have indicated that libraries adopting open source technology in their automation are attracted to the use of the Koha not only because of its free availability but due to the philosophy of open source software. Morgan (2006) as cited in Kumar & Jasimudeen (2012) added that libraries are attracted to free open source softwares for the following reasons:

- Community participation - one shares his expertise with others and solve common computing problems as well as receive free technical support from the community.

- Investment in personnel – learned skills by staff are transferable.

- Taking responsibility for your computing environment - software is customized by the adopted library to suit its operations.

- Greater opportunities for innovation – software allow libraries to combine other computer technologies to provide innovative services to meet users emerging expectations.

Automation of Academic Libraries

Automation can be described as the use of computers and computer-based tools in the operation of the various routine task performed by humans. Library automation can be described as the process of computerizing library operations. It involves the application and use of ICT in libraries. Library automation is required in academic libraries of today, to meet the demand of the massive increase in the collection and transmission of new knowledge, and the problems of their acquisition, storage, processing, and dissemination (Bhardwaj & Shukla,

2000). Library automation must be consistent with library standards and guidelines. Sharma (2007) defined library automation to involve the computerization of the entire library housekeeping operations like acquisition, cataloging, circulation, serials control, and the handling of a large quantity of data more efficiently and quickly using computers and other modern information technologies. This definition suggests a holistic approach of using computerized information processing system in the daily operation and provision of library services. It should, therefore, be noted that when a system is in operation, careful attention is crucial to ensure that procedures are adjusted for effective and efficient use of available features, and job design. An automated library is, therefore, one in which a computer-based system or a technology is used to control only one or several key functions performed by the library such as serials control, providing reference service, acquisition and cataloging of materials, and circulation.

The advent of automation in libraries has restructured academic libraries and their mode of operation in recent times. In a traditional academic library, a typical structure will be the division of the library into functional sections of acquisition, cataloging and classification, circulation, serial control, subject indexing, and face-to-face reference service. These key divisions manually performed their respective activities such as the acquisition librarian being responsible for purchasing library materials from bookshops; the cataloguing and classification section being responsible for cataloguing and classifying library materials, preparing card catalogs and processing the books for easy identification

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on the shelves; whereas the circulation section receive and issue library books to users by their use of library cards (Bhardwaj & Shukla, 2000). A research conducted by Ayiah and Kumah (2011) indicated that traditional academic library's processes and structures have been proven unsatisfactory to respond quickly in a technology-driven age. They further indicated that change is not only desirable but also compulsory because technology has many prospects that cannot be overlooked. Moyo (2004) asserted that automation of academic libraries has brought a transformation of the traditional academic library services to the provision of electronic services including online services and virtual reference services.

Automation of academic libraries has improved efficiency in service provision. It ensures effective control of the overall operations of the academic library, improves control of the library collections, improves existing services and introduces new ones, shares resources with other libraries and avoids duplication of work (Sharma, 2014). For example, the acquisition librarian can order books online just by clicking a button while sitting behind a computer. Other electronic collections such as e-books, e-journals, and databases are accessed using computers. It must, therefore, be noted that for academic libraries to deal with new challenges due to the increasing demands of its clients, they must consider repackaging the library services using ICT (Parvez, 2011). According to Omeluzor & Oyovwe-Tinuoye (2016), the integration of the appropriate automation into library operations and activities enable users of academic libraries to have access to information materials at any time, irrespective of their locations.

For example, accessing the current content of information from online databases and quick response for ILL/DD services via email are made with the use of computers. Automation of academic library operations, therefore, provides client services very rapidly, adequately and economically (Sharma, 2007; Rasul & Sahu, 2011).

ICT Application in Academic Libraries

The provision of information services is a major function of academic libraries to support teaching, learning, and research of universities. Academic libraries of today are faced with the challenge of either continuing with the provision of print information or digital information Otike (2004). The future of academic libraries is likely to be fully digital as universities are involving ICT in their teaching and learning process. A study by Gould and Gomez (2010) on "new challenges for libraries in the information age: a comparative study of ICT in public libraries in 25 countries", they stated that libraries are not fully utilized by their users because of insufficient resources and lack of integration of ICTs in their operation and service provision. They added that if the services offered by libraries are not satisfactory to their clients need, then, it would not be surprising that their clients will ignore them. Odero-Musakali and Mutula (2007) have asserted that the future of universities and academic libraries largely depends on their ability to hold unto emerging technologies to perform their activities. This suggests that academic libraries which operate in the universities have no choice than to utilize ICT in their operations. According to Adeleke and Orolunsola (2010), manual systems of operation in libraries must give way to ICT to enable

them function effectively in today's information age.

ICT has helped academic libraries to globalise their information provision. This shows the worldwide impact that ICT has made on academic libraries. Omoniwa (2001) hypothesized that globalization of information through ICT application will be the trait of great libraries in the twenty-first century. Studies by Niegard (2007) and Makori (2009) indicated that academic libraries are currently operating in a new technological environment to satisfy the needs of their clients. Kofi and Opare-Adzobu (2010) added that ICT usage reduces the time and energy spent by staff in the overall execution of library operations and services as well as providing convenience for library users in accessing information and services of the library regardless of the location where they are and time they access the library services. A study on the "application of information and communication technologies in special libraries in Kerala-India" by Haneefa (2007) revealed that recent libraries operations evolved in response to certain problem situations. Hence, academic libraries must employ ICT to simplify their operations and information services to meet the diverse needs of their clients. The ICTs used in academic libraries tries to provide several services such as online electronic resources/databases, the Internet, online access catalogs, online digital archives, and digital content services (Ghuloum & Ahmed, 2011).

ICT Resources Used in Academic Libraries

ICT resources refer to all forms of technological tools including diverse hardware and software used in accessing, manipulating and communicating information. These technological tools include computers, projectors, digital

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cameras, CR-ROM, printers, local area network (LAN), mobile phones, barcode readers and printers, digitizers, microfilm readers, television, photocopiers, close circuit television (CCTV), electronic security systems (electronic security gates) or radio frequency identification (RFID) system, Internet, standby power supply, etc. (Rosenberg, 2005; Osayande, 2011; Obinyan & Unuabor, 2013; and Asogwa, Ugwu, & Ugwuanyi, 2015). The use of these resources in academic libraries cannot be over emphasized as they help in accessing information. A study by Ahmad and Fatima (2009) found out that researchers in universities use several ICT resources for the purpose of research and therefore commented that ICT resources help to access information, manage and easily communicate information.

Availability of ICT resources in academic libraries is crucial. These resources help in the provision or accessibility of information. Spagnoletti and Resca (2008) have indicated that, for any information resource materials and system to serve their purpose, the resource, the system and the information contained in them must be available whenever they are needed. This means that resources used to access information in the library must be available and functioning correctly. The knowledge of the available ICT infrastructure, its robust model, cost effectiveness and the consciousness of their maintenance requirement should be major considerations for heads of institutions when making decisions about acquiring ICT resources for development. The availability of ICT resources including security systems also ensure the safety of the library books and other materials. According to Aina (2004), library resources or materials must

be safe; hence security devices must be made available by libraries to ensure that the materials are not stolen or mutilated. Other resources that must be available to ensure continual provision of services and information are generators or standby power supplies. Omosekejimi, Ijiekhuamhen and Ojeme (2015) indicated in their study that availability systems which include standby power supplies aim at helping provide service at all times to prevent service disruptions due to power outages and hardware.

A major investment into ICT resources by academic libraries or universities is unavoidable and vital to the implementation of any library automation project, as well as, for the sustainable development of the library. Rosenberg (2005) posited that it is crucial for a library that wants to grant access to electronic resources and services to have adequate ICT resources which are networked including computers with Internet connectivity. It is clear that the disparity in the status of ICT resources of different universities is due to the financial investment made by the university or donor interventions received. This leads to the different rate of ICT adoption in various universities. A study by Shafi-Ullah and Roberts (2009) have indicated that ICT infrastructure is indispensable in developing a research culture in tertiary institutions and therefore recommended that higher educational institutions should allocate funds for the development of the ICT infrastructure.

Internet Usage in Academic Libraries

The Internet has helped in providing access to information in any automated academic library environment from remote locations worldwide. The

Internet can be simply defined as a global network of computer networks (Boohene, Kwafoa, Biney, & Nunekpeku, 2014). One can describe the usage of Internet in the provision of information services as a paradigm shift due to the shift from the manual way of accessing information sources to a more remote and faster way to access information. The Internet is now used to access networked information resources from online databases. This technological idea has bridged the information access gap between the developed and developing countries. In reference to Oyedum (2007), he stated that an Internet resource enables librarians especially reference librarians to answer questions and provide information which is usually more up-to-date than the printed resources. He added that with the Internet, one can access a growing database of information online. Uddin (2003) research on "Internet use by university academics - a bipartite study of information and communication needs" indicated that there was the need for investment in the deployment of ICT in universities so that Internet usage for research, teaching, and learning will enhance academics.

Slow Internet connectivity speed has been a challenge to many establishments including universities in Africa. A survey by Jensen (2002) as cited in Global e-Schools and Communities Initiative (2011) revealed that almost 60% of African countries have bandwidth that is less than that of a typical institution in the developed world. It is quite alarming from Jensen (2002) report that almost close to decade, the Global e-Schools and Communities Initiative (GeSCI) thematic paper in 2011 also reported that access to bigger bandwidth for ICT resources which require Internet is a major hindrance in Africa. They further

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indicated that even for most universities in Africa, the basic infrastructure needed to support applications requiring bigger bandwidth is also inadequate. Although the history of Internet availability in Ghana for example, dates back to the year 1995 via the support of the then Network Computer Systems (Boohene et al., 2014), one could say that the slow speed of Internet connectivity in several establishments in Ghana is still a major challenge today.

Deliberate steps should be embarked on by tertiary institutions to improve the Internet connectivity speed especially considering the projection made by Claudine (1998) that the Internet will have a more pervasive impact on the future of education and libraries of universities. According to Olufunmilola (2012), priority should be given to Internet connectivity speed to support the informational activities carried out by both staff and students in universities. Internet connection speed is, therefore, relevant in retrieving timely information quickly and also in the provision online service (Qutab, Bhatti & Ullah, 2014).

Globalization has encouraged independent learning, teaching, and research through the Internet. Before the use of Internet for the acquisition and dissemination of information; learning, teaching, and research in universities were limited to the physical materials available to both students and lecturers by their institution's library or personal materials purchased. With the use of Internet, the channels for acquiring and sharing information for learning, teaching and research in tertiary education have moved from the physical materials to electronic materials which present information in real time and space. According to Cisse (2004), ICT has enabled students and researchers to have access to limitless

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information and communicate globally. This is ensuring a meaningful and successful communication in education.

ICT Proficiency of Academic Library Staff

The human resource of every institution is counted as the most important resource for the successful operations of an organization. As indicated by (Sharma, 2007) that library automation is successfully implemented by the operations carried out by the available hardware (infrastructure), adopted software, and most importantly the people using the system employed. He further stated that skilled personnel (staff) are required to deal with new technological challenges and opportunities such as upgrading of software and hardware when necessary. It should, therefore, be noted that for every automated system, irrespective of its simplicity, will require effective training to operate it properly.

Lack of ICT professionals or experts is a major barrier to the integration of ICT in any organisation. A study by Mulimila (2000) had revealed that lack of trained library staff on information technology was the key hindrance in the application of ICT in East African government-owned university libraries. Other researchers such as Tucker, Younis, and Shalaby (2002) and Suku and Pillai (2005) have also reported the lack of skilled staff or the unavailability of technical experts to be a major problem to carry out library automation projects. It should, therefore, be noted that in the library environment, the need for multidisciplinary expertise is required especially in the area of Information and Communications Technology considering the present digital age of information. Sharma (2007) has indicated that a lot of library staff in various universities have low ICT skills

which could lead to the lack of appropriate technical advice and support needed to meet the technological demands of the library. This could lead to the selection of inappropriate software and hardware which may negatively impact on the library service delivery. The wrong selection of hardware or software used in the library may also result in frequent breakdowns which will affect the operations of the library and at the long run results in waste of funds.

Staff Training on Library Automation

Training is seen as the process of teaching workers new skills which are critical in the performance of their jobs. Al-Ajlouni, Athamneh and Jaradat (2010) described training to be "a systematic development of knowledge, skills, and attitudes required by employees to perform adequately on a given task or job." Staff training can sometimes be undertaken immediately after recruitment or done on periodic basis depending on an organisation's policy.

Recent deployment of automated systems in cataloging, circulation, and the use of OPAC in academic libraries have resulted in the need for training of library staff to have varied skills, knowledge and abilities. Library staff must have well-built abilities in the retrieval of all forms of print and electronic information in academic library. Fitzgibbons (2008) emphasized that the library work itself require some computer knowledge and therefore computer skills are requisite for library staff to assist library users in all areas of service need. Library staff training contributes extensively to the academic library productivity because trained staff are mostly motivated and better equipped to use their skills and knowledge. However, Bamidele, Omeluzor, Imam, and Amadi (2013) identified in their study

that library staff training and development seem not to be considered as important and therefore recommended for librarians to train staff as a means of equipping them for future responsibilities. According to Ayoku and Okafor (2015) and Adeleke and Olorunsola (2010), library management must ensure that librarians are trained on ICT to be aware and also understand the new service dimension introduced through the use of ICT in libraries.

Perception of Library Staff on Automation

The perception of library staff has been recognized as a major input in the successful automation of academic libraries. Saleem, Shabana and Batcha (2013) described library automation as the concept of reducing the human intervention in all library services for user satisfaction in accessing information at the lowest cost. The thought of automation being used to reduce human involvement is enough to put fear into library staff. This thought can affect one's perception regarding automation.

Perception may be said to deal with how someone understands issues or looks at things. Some studies have identified among other factors like an individual's background, motivation, personality, knowledge, and experience to influence how one perceives things (Hatfield, 1997). This implies that the perception of a library staff will determine the response, action/behavior or attitude toward new technologies implemented in his working environment in the library. According to Uwaifo (2007) and Kinengyere (2007), workers attitude towards any technological change determines their positive or negative response

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to the change. It is crystal clear that technology increases efficiency, effectiveness, confidence and job satisfaction of workers.

In today's world, the lack of tech-savvy can be very frustrating and demotivating for some academic library staff. Sharma's (2007) study indicated that there are some library staff that are conservative with regards to technology and therefore have developed some fear towards the use of technology. This signals that the disregard of people's response to technological change will be detrimental to the successful implementation of any automation project in an organization. Al-Zahrani (2000) has asserted that the integration of technology into library operations will require positive attitudes from the library staff to utilize the technology to its full potential. It should also be noted that the perception of library heads towards technology has greater power to change the state of libraries. According to Carnoy (1999), the challenge faced in developing countries does not have to do with purchasing hardware or software for new technologies adopted but rather the training of the staff to accept and effectively use those technologies. The readiness of library staff to accept and use the adopted integrated library software is very important.

ICT for Sustainable Development of Academic Libraries

The integration of ICT in academic libraries has greatly transformed the operations of the traditional academic libraries. Several decades ago, one may have asked if computers are needed in academic libraries. But today, such a question is not relevant as academic libraries around the world have realized that apart from the relevance of traditional libraries, computers are important tools for

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this information age. Morgan (1998) as cited by Adeyoyin (2006) rhetorically asked why anybody would trust a librarian today whose profession is about information and knowledge and had not mastered the use of a computer. Adeyoyin (2006) added that librarians who have upgraded themselves understand what the information age is about and take advantage of ICT. Karisiddappa (2004) asserted that "for a sustainable development of a nation, ICT must become essential knowledge to every nation and more so to the developing nations". This implies that ICT serve as a springboard for development because it can be applied to all areas of life.

The future of academic libraries in Africa is guaranteed by the integration of ICT. According to Afolabi and Abidoye (2011), a library can loose its significance in this digital world if it does not integrate technology into its operations to sustain its relevance. Our world today makes a demand on academic libraries to be able to respond and adjust to the rapid changes in society while maintaining the efficiency and effectiveness of their operations (Adeyoyin, 2006).

The main purpose of academic library automation is to introduce a system of operating and controlling processes through automatic means using electronic devices and technologies to decrease the human efforts and involvement in the process for a more efficient productivity. Academic library automation employs the use of ICT to provide continues development and also restructure the way academic libraries access, store, manipulate and share information to clients. It is, therefore, necessary for academic libraries to meet

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the present and future information needs of their users through the acquisition of printed and non-printed materials. The integration of ICT into academic library services provide users with the opportunity to access abundant information at minimal cost within the shortest possible time available (Idowu, 2009). ICT has, therefore, become an essential tool for the sustainable development of academic libraries.

Barriers to ICT integration in Academic Libraries

Emerging technologies in academic libraries come with new opportunities, as well as, new challenges. With regards to barriers to ICT integration in academic libraries, there have been several works done in this area, hence, the researcher will outline these barriers identified by several scholars and researchers. The most prevalent factors were: Lack of support from university management (Amekuedee, 2005; Saxena & Dubey, 2014), lack of sufficient funds (Haneefa, 2007; Aina, Okunnu, & Dapo-Asaju, 2014; Saxena & Dubey, 2014), Inadequate power supply (Okiy, 2005; Haneefa, 2007; Aina, Okunnu, & Dapo-Asaju, 2014), lack of users' education and training (Sami & Pangannaiah, 2006; Aina, Okunnu, & Dapo-Asaju, 2014); lack of proper automation guidelines (Haider, 2004; Haneefa, 2007), inadequate ICT facilities (Rosenberg, 2005; Saxena & Dubey, 2014); and lack of skilled staff or retained IT experts (Mulimila, 2000; Starr, 2001; Rosenberg, 2005; Younis, 2005; Suku & Pillai, 2005; Ani, 2005; Haneefa, 2007; Ghuloum & Ahmed, 2011).

Summary

Most literature on the usage of ICT in academic libraries only employed

descriptive analysis for the studies hence; the studies do not establish relationships and predictions on the subject matter.

CHAPTER THREE

RESEARCH METHODS

Overview

The chapter describes the methodological procedures employed to assess the rate of ICT deployment and the level of academic library automation in University of Cape Coast. It describes the research design or approach, the study area, the population and the sample size, the sampling procedure, data collection instruments, data collection procedures and data analysis.

Research Design

The researcher employed a mixed method research design to undertake the study. This type of design involves the use of both qualitative and quantitative research procedures to collect and analyze data for just one particular study in order to better understand the research problem of the study (Creswell, 2009). This implies the gathering of qualitative data from primary sources such as interview, document reviews and observation; and quantitative data from secondary sources like journal articles and books. One good reason for which the researcher employed the mixed method design is that it helps in building the strengths of using both qualitative and quantitative data for research (Creswell, 2009).

Study Area

University of Cape Coast was established in the year 1962 in the Central Region of Ghana. The university was founded for the purpose of training graduate

teachers for second cycle institutions like the teacher training colleges and the technical institutions in Ghana (Vice Chancellor's Annual Report, 2016). However, the university due to the several programmes it offers does not only produce highly skilled labour in education but also qualified health care professionals, administrators, agriculturalists, and many more.

The university has a five story library complex formerly known as "the main library". It is a hybrid academic library that provides information to support the teaching, learning and research activities undertaken by the institution for the accomplishment of its mission and vision. The Sam Jonah library is among one of the biggest academic libraries in Ghana. It has the capacity for holding over 750,000 volumes excluding pamphlets and journals. The library can seat 2,000 users at a time (UCC Library Guide, 2012). The main library complements the other satellite libraries in the various colleges, faculties, departmental and hall libraries of the university. The university library which is now known as "Sam Jonah library" came about as a result of a recommendation proposed by the University of Cape Coast 50th anniversary Ad hoc committee for the naming of monuments, landmarks and buildings of the institution. At the second section of the first regular meeting held by the university's academic board on 27th October, 2015 and considered the report of the Ad hoc committee and approved that the University of Cape Coast Library should be named after the Chancellor of the University, Dr. Sir Sam Jonah (Vice-Chancellor's Annual Report, 2016).

Population

The population of a study refers to all items or people which are sometimes known as the unit of analysis with the elements or characteristics that a researcher wants to study (Bhattacherjee, 2012). The unit of analysis can be an item or entity such as an object, country or organization, as well as, a person or group of persons of which scientific inferences are drawn. The population of the study is all staff and students of University of Cape Coast. The target population for the study comprised the staff of Sam Jonah library and the users of the library facilities. The chosen population was because they are the stakeholders that are directly affected by the decisions made by the library and secondly because the objectives of this study relate to them. The total population was 2,129, which was made up of 129 library staff and 2,000 users/clients as the library can seat that number at any particular time of use (UCC Library Guide, 2012). The library staff consisted of the Senior members, Senior staff and Junior staff categories. The library users also consisted of the undergraduate students, post graduate students, and lecturers/researchers of the university who come to the premises of the library to use the facilities.

Sampling Procedure

Sampling refers to the process of selecting a sampling frame, which is the accessible section of the population targeted from which the sample will be drawn (Bhattacherjee, 2012). A sample size of 419 was chosen for the study, which consisted of 97 library staff and 322 users/clients of the library facilities. According to Krejcie and Morgan (1970), a population of 2,129 should have a

sample of 322 and a population of 129 should have a sample of 97 of the elements for the study. The researcher employed purposive sampling method to select the 97 library staff. Purposive sampling is a non-probability sample which involves a researcher consciously selecting some people to use in a study based on the objective of the study and the characteristics of the population (Bhattacherjee, 2012; Cresswell & Plano-Clark, 2011). The researcher therefore used the purposive sampling method to select the ninety seven staff to respond to the questionnaire based on their knowledge and experience, as well as, willingness to provide information for the study.

On the other hand, a disproportionate stratified random sampling was used to select the 322 users/clients of the library facilities. A disproportionate stratified random sampling is the sampling method where the researcher divides the sampling frame into strata (subgroups) and use different fractions for the various subgroups because of the conclusion the researcher wants to obtain from the population (Bhattacherjee, 2012). The disadvantage to this type of sampling is when the researcher put too much emphasis on one strata leading to a skewed result. The Sam Jonah library has places designated for lecturers and researchers only; post graduate students only; and for undergraduate students. The users of these designated areas (lecturers and researchers, post graduates, and undergraduates) and the staff of Sam Jonah Library are the subgroups of the population. The researcher, however, chose this sampling method so he could include the views of both the few lecturers and post graduate students who by

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observation come to the library to use the facilities as compared to the undergraduate students.

Table 1: *Sample Size of Respondents*

Stakeholders	Sample Size
Sam Jonah Library Staff	97
Lecturers/Researchers	11
Post Graduate Students	59
Undergraduates	252
Total	419

Source: Field data (2017)

Data Collection Instrument

The main data collection instrument used for the study was a questionnaire. A questionnaire is an instituted set of questions used to collect people's opinions and attitudes on a specific topic (O'Leary, 2004). According to Fraenkel and Wallen (2000) and Bhattacherjee (2012), questionnaires are useful tools used in collecting descriptive data for the measurement of attitudes, answering research questions and testing hypotheses. Questionnaires are inexpensive, easier to collect and analysed within a relatively short period of time. They are also easy to be replicated and tested for reliability due to the fixed set of

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questions asked (Mavodza, 2010). This instrument was very appropriate for this study because it allowed the respondents to fill the questionnaire within their own spare time, thus ensuring that selected staff with busy schedules also participates in the study.

Two sets of structured questionnaires were designed, one set was used to collect data from the staff of Sam Jonah library and the other was used to collect data from the clients of the library facilities. The questionnaire for staff had sections A, B, C, D, and E (Appendix A). Section A was made up of items which focused on the biodata or background of library staff. Section B had items on the ICT resources used for automation. Section C contained items that deal with the impact of Internet connectivity on automation. Section D had items which focused on staff ICT proficiency and lastly section E had items on staff perception of automation. The questionnaire for library clients had two sections, A and B (Appendix B). Section A was made up of items that elicit information about the biodata or background of the respondent and section B had items that focused on library services accessed by client and their satisfaction of the automation of the library.

Some questions of the questionnaire were adopted and modified from those used in related studies. The questionnaires were guided by the research objectives. The questionnaires consisted of closed-ended questions which included Likert scale questions. According to Barlett, Kotrlik and Higgins (2001), the Likert scale is an ordinal scale, by which the answers of respondents can be categorised to a hierarchical order, to measure attitude providing a range of

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responses to a given question or statement. They also added that the Likert scale is one of the most popular scales used when testing attitude of respondents because it is respondent friendly.

The researcher on the other hand, used informal interview to collect some data related to the study. An informal interview is a type of unstructured interview which is much more of a conversation based on unstructured set of questions that are generated by the interviewer during the time of the interview for the purpose of gathering information (Gray, 2009).

Data Collection Procedure

The researcher obtained permission from the Librarian of Sam Jonah library to collect the data for the study. Copies of the questionnaires were made and distributed to the respondents. The instructions to the questionnaires and the items were clearly explained to them. Respondents were asked to respond to the instrument and either leave it on their desk or submit to the reference librarian in the library when completed. However, questionnaires given to the library staff were personally collected by the researcher. This took a period of four weeks from 1st May 2017 to 26th May 2017. The questionnaires were personally administered by the researcher to both library staff and library clients who use the library facilities during the working hours of 9:00am to 4:30pm each day from Monday to Friday.

Primary data was collected by the researcher through an informal interview with the former head of the Digital Section of the library, who helped

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provide information about the history of the automation process in the library used in this study.

Data Processing and Analysis

The data collected was coded and analysed descriptively using the Statistical Package for the Social Science (SPSS) version 21. According to Field (2009), Statistical Package for the Social Sciences is a software application program that is used for statistical analysis, manipulating of quantitative data, and also for producing tables and graphs that summarise the data collected.

The survey questions were structured in a way that could easily be translated into a format that could be analysed by the SPSS. Appropriate codes were assigned to all variables, and numerical labels were used to identify the categories of each variable. Both descriptive statistics and inferential statistics were used for the study. Analysis of the data was done carefully for fair judgement, which enhanced the interpretation of the study results.

Ethical Consideration

All Studies which involve human interactions have ethical implications. Hence, the researcher carefully explained the purpose, objectives, and data collection procedure to the respondents, and emphasized that their participation is voluntary. Privacy and anonymity of all respondents was of much importance to the researcher, and therefore all respondents were assured of their confidentiality. They were informed that the data collected was strictly for academic purpose. This helped establish trust between the researcher and the respondents. The use of offensive, discriminatory, or other unacceptable language was avoided in the

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formulation of the questionnaire and during the informal interview. Proper acknowledgement of all sources of information was used for the study.

Summary

This chapter described the methodology used to conduct the study and procedures that were used to collect the data from the respondents. A mixed research method design was used to build the strengths of using both qualitative and quantitative data for research. The population, study area, the sample and sampling procedures, the research instruments, as well as, the data collection procedures and the data processing and analysis were also described in this chapter. The chapter further discussed the ethical considerations employed by the researcher in carrying out the research. The study was limited to only one academic library that is the Sam Jonah library due to limited resources to consider all academic libraries in Ghana. Hence, the findings of this study cannot be generalised and any attempt to generalise should be done with caution.
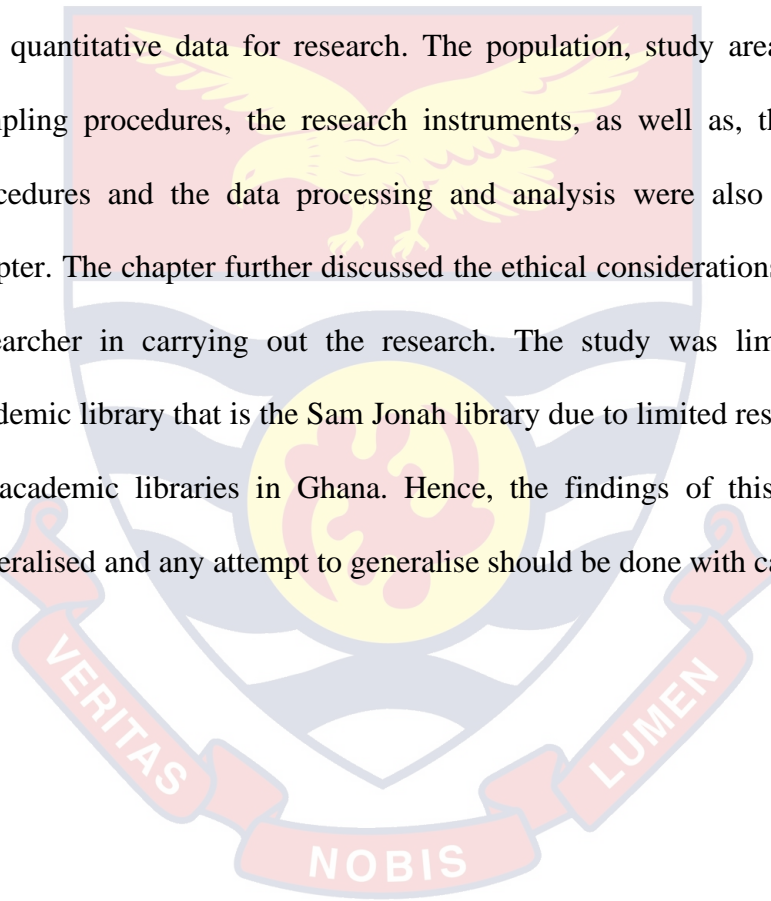
CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

This chapter deals with the data presentation and analysis. In this chapter, all data gathered for the study are organized, analysed and this is followed by discussion of key issues relating to the findings of the study. Frequency tables are provided to give statistical reflections on key issues in terms of the research hypotheses. The main thrust of the study is to assess the rate of ICT deployment and level of academic library automation in University of Cape Coast.

Demographic Characteristics of the respondents

This section highlights the demographic characteristics of respondents used for the study, which comprises biodata of the library staff and the clients of Sam Jonah library.

Table 2: *Gender of the Respondents*

	Library Staff		Library Clients	
	Frequency	Percent	Frequency	Percent
Male	59	60.8	228	70.8
Female	38	39.2	94	29.2
Total	97	100	322	100

Source: Field survey (2017)

Table 2 indicates that a total of 97 library staff were selected for the study, 59 (60.8%) were males and 38 (39.2%) were females. Also, out of the total

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number of 322 clients who were used for the study, 228 (70.8%) were males and

94 (29.2%) were females. This suggests that majority of the respondents involved

in the study were males.

Table 3: *Age of the Respondents*

	Library Staff		Library Clients	
	Frequency	Percent	Frequency	Percent
18 – 29 years	18	18.6	253	78.6
30 – 39 years	56	57.7	45	14.0
40 – 49 years	13	13.4	22	6.8
50 and above	10	10.3	2	0.6
Total	97	100	322	100

Source: Field survey (2017)

Table 3 indicates that 18 (18.6%) of library staff and 253 (78.6%) of

library clients fell in the 18 – 29 age range. Fifty six (57.7%) of library staff and

45 (14.0%) of library clients respectively fell in the 30 – 39 age range and 13

(13.4%) of library staff and 22 (6.8%) of library clients fell in the 40 – 49 age

range. Lastly, 10 (10.3%) of library staff and 2 (0.6%) of library clients fell in the

age range of 50 years and above. The analysis depicts that majority of the library

staff and library clients used for the study fell within 30 – 39 years and 18 – 29

years respectively.

Table 4: *Categories of Library Staff*

Category	Frequency	Percent
Senior Member	10	10.3
Senior Staff	63	64.9
Junior Staff	24	24.7
Total	97	100

Source: Field survey (2017)

Table 4 depicts the categories of the library staff involved in the study. Ten (10.3%) of the staff were senior members, 63 (64.9%) were senior staff and 24 (24.7%) were junior staff who were selected for the study. The analysis shows that majority of the library staff involved in the study were senior staff.

Table 5: *Categories of Library Clients*

Category	Frequency	Percent
Undergraduate	252	78.3
Post graduate	59	18.3
Lecturer/Researcher	11	3.4
Total	322	100

Source: Field survey (2017)

Table 5 shows the categories of the library clients used for the study. Two hundred and fifty two (78.3%) of the respondents were undergraduate, 59 (18.3%) were post graduate and 11 (3.4%) were lecturers/researchers who come to the

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Sam Jonah library to use the facilities. The analysis indicates that majority of library clients involved in the study were undergraduate students.

Table 6: *Section/Department of Library Staff*

Section/Department	Frequency	Percent
Acquisition	8	8.2
Cataloguing	11	11.3
Readers Service	20	20.6
Periodical	13	13.4
Digital	8	8.2
RCAMAT	7	7.2
Special Collection	6	6.2
E-resource/ILL DD	3	3.1
Reprographic/Bindery	6	6.2
Departmental library	15	15.5
Total	97	100

Source: Field survey (2017)

Table 6 indicates the various sections or departments of the library staff involved in the study. Eight (8.2%) of the staff work at the acquisition section, 11 (11.3%) from the cataloguing section, 20 (20.6%) from readers service section, 13 (13.4%) from periodicals section, 8 (8.2%) from digital section, 7 (7.2%) from RCAMAT, 6 (6.2%) from special collection section, 3 (3.1%) from E-resources or ILL/DD section,6 (6.2%) from reprographic/bindery section and 15 (15.5%) from the departmental library.

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Table 7: *Staff Number of Years Worked in the Library*

Years worked	Frequency	Percent
1 – 5 years	23	23.7
6 – 10 years	42	43.3
11 – 15 years	18	18.6
16 – 20 years	5	5.2
21 and above	9	9.3
Total	97	100

Source: Field survey (2017)

Table 7 shows the number of years that the staff involved in the study had worked in Sam Jonah library. Twenty three (23.7%) fell in the range of 1 – 5 years, 42 (43.3%) fell in the range of 6 – 10 years, 18 (18.6%) fell in the range of 11-15 years, 5 (5.2%) fell in the range of 16 – 20 years and lastly 9 (9.3%) fell in the range of those who have worked for 21 years and above. The analysis however depicts that most of the staff used for the study have worked in Sam Jonah library for 6 to 10 years.

Research Objective 1: Explore the availability of ICT resources and the level of Sam Jonah library automation.

Table 8: *ICT Resources Available at Sam Jonah Library*

ICT Resource	Availability				Quantity				Condition					
	Yes		No		Adequate		Not Adequate		Good		Fairly Good		Bad	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Computers	97	100	0	0.0	25	25.8	72	74.2	40	41.2	55	56.7	2	2.1
Library automation software	95	97.9	2	2.1	59	62.1	36	37.9	44	46.3	43	45.3	8	8.4
Network Server	97	100	0	0.0	53	54.6	44	45.4	32	33.0	52	53.6	13	13.4
Network Printer	84	86.6	13	13.4	11	13.1	73	86.9	31	36.9	44	52.4	9	10.7
Scanners	95	97.9	2	2.1	23	24.2	72	75.8	36	37.9	54	56.8	5	5.3
Local Area Network (LAN)	92	94.8	5	5.2	62	67.4	30	32.6	45	48.9	40	43.5	7	7.6
Projector	90	92.8	7	7.2	17	18.9	73	81.1	31	34.4	56	62.2	3	3.3
External hard drive/ Backup drives	80	82.5	17	17.5	23	28.8	57	71.3	35	43.8	42	52.5	3	3.8
Smart TV	58	59.8	39	40.2	25	43.1	33	56.9	39	67.2	18	31.0	1	1.7
Microfilm reader	0	0.0	97	100	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bar code	95	97.9	2	2.1	45	47.4	50	52.6	51	53.7	43	45.3	1	1.1
Bar code printers	75	77.3	22	22.7	75	100	0	0.0	45	60.0	30	40.0	0	0.0
Book scanner for digitization	91	93.8	6	6.2	18	19.8	73	80.2	35	38.5	52	57.1	4	4.4
CD-ROM Reader/writer	84	86.6	13	13.4	31	36.9	53	63.1	34	40.5	47	56.0	3	3.6
Security gate for book check system	97	100	0	0.0	39	40.2	58	59.8	55	56.7	42	43.3	0	0.0
CCTV Cameras	0	0.0	97	100	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Photocopying machines	97	100	0	0.0	9	9.3	88	90.7	26	26.8	68	70.1	3	3.1
Digital Cameras	70	72.2	27	27.8	13	18.6	57	81.4	19	27.1	48	68.6	3	4.3
Generator	85	87.6	12	12.4	76	89.4	9	10.6	0	0.0	0	0.0	85	100
Uninterruptible Power Supply (UPS)	88	90.7	9	9.3	7	8.0	81	92.0	8	9.1	55	62.5	25	28.4
CD/DVD player	86	88.7	11	11.3	43	50.0	43	50.0	20	23.3	66	76.7	0	0.0
Inverter	47	48.5	50	51.5	12	25.5	35	74.5	13	27.7	32	68.1	2	4.3

Source: Field survey (2017)

Table 8 indicates ICT resources availability, quantity and condition at Sam Jonah library. The analysis reveals that although there are computers, external hard drives, photocopying machines, scanners, network printer, projector, book scanner for digitization, CD-ROM writer and digital camera available in the library, staff responded that they were inadequate. Paolo and Resca (2008) have indicated that, for any information resource materials and system to serve their purpose, the resource, the system and the information contained in them must be available whenever they are needed. This means that resources used to access information in the library must be available and functioning correctly.

According to Table 8, all 97 (100%) of the staff responded that the library does not have CCTV cameras. The absence of CCTV cameras within the Sam Jonah library raises the question of loosed security in the library. Although the analysis indicates the availability of a security gate for book theft detection, 58 (59.8%) of the staff indicated that it was inadequate. According to Aina (2004), library resources or materials must be safe; hence security devices must be made available by libraries to ensure that the materials are not stolen or mutilated. The availability of CCTV cameras in the library will instill some consciousness of being monitored into the library clients to deter them from stealing library resources such computer mouse and other computer accessories. It will also serve as protection, as well as, provide comfort for users to use their laptops in the library as there have been some reported cases of stolen laptops belonging to clients.

Also, Table 8 shows that 85 (87.6%) of the staff who responded that the

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library has a generator indicated that the condition of the generator is bad. This implies that the library operations may be affected in the event of general light off. Although the analysis indicate the availability of uninterrupted power supply (UPS) and inverters, which could have been a temporary measure to deal with the situation of general light off considering the bad condition of the generator, 81 (92.0%) and 35 (74.5%) respectively out of those who indicated the availability of UPS and inverters, indicated that they were inadequate. According to Omosekejimi et al (2015), availability systems which include standby power supplies aim at helping provide service at all times. This prevents service disruptions due to power outages and hardware. This concludes that backup power supply must be available always to ensure undeniable service to clients. This supports the assertion by Global e-Schools and Communities Initiative (2011) that a stable electrical supply impacts on the deployment of ICT in Education and developmental initiatives.

Hypothesis 1

H₀: There is no relationship between availability of ICT resources and the level of Sam Jonah library automation.

The Table 9 shows the correlation between the availability of ICT resources and the level of Sam Jonah library automation.

Table 9: *Correlation between Availability of ICT Resources and the Level of Sam*

Jonah Library Automation

ICT Resources		Level of Sam Jonah Library Automation
Computer	Pearson Correlation	-.061
	Sig. (2-tailed)	.554
	N	97
Library Automation Software	Pearson Correlation	.230[*]
	Sig. (2-tailed)	.025
	N	95
Networked Server	Pearson Correlation	.230[*]
	Sig. (2-tailed)	.023
	N	97
Network Printer	Pearson Correlation	.153
	Sig. (2-tailed)	.165
	N	84
Scanner	Pearson Correlation	-.072
	Sig. (2-tailed)	.488
	N	95
LAN	Pearson Correlation	.265[*]
	Sig. (2-tailed)	.011
	N	92
Projector	Pearson Correlation	.126
	Sig. (2-tailed)	.236
	N	90
External/Backup drives	Pearson Correlation	.187
	Sig. (2-tailed)	.097
	N	80
Smart TV	Pearson Correlation	.115
	Sig. (2-tailed)	.389
	N	58
Microfilm reader	Pearson Correlation	.[b]
	Sig. (2-tailed)	
	N	0
Barcode reader/scanner	Pearson Correlation	.102
	Sig. (2-tailed)	.324
	N	95
Barcode Printer	Pearson Correlation	.[b]
	Sig. (2-tailed)	
	N	75
Book scanner for digitizing	Pearson Correlation	.120
	Sig. (2-tailed)	.258
	N	91

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Continuation

CD-ROM reader/Writer	Pearson Correlation	.259*
	Sig. (2-tailed)	.018
	N	84
Security gate for Book Check	Pearson Correlation	.020
	Sig. (2-tailed)	.848
	N	97
CCTV Camera	Pearson Correlation	
	Sig. (2-tailed)	.b
	N	
Photocopy Machine	Pearson Correlation	0
	Sig. (2-tailed)	.080
	N	.434
Digital Camera	Pearson Correlation	97
	Sig. (2-tailed)	.172
	N	.156
Generator	Pearson Correlation	70
	Sig. (2-tailed)	.087
	N	.429
UPS	Pearson Correlation	85
	Sig. (2-tailed)	.066
	N	.539
CD/DVD Player	Pearson Correlation	88
	Sig. (2-tailed)	.248*
	N	.021
Inverter	Pearson Correlation	86
	Sig. (2-tailed)	.243
	N	.099

*. Correlation is significant at the 0.05 level (2-tailed).
b. Cannot be computed because at least one of the variables is constant.

Source: Field survey (2017)

From Table 9, a correlation analysis is performed to determine whether there is a relationship between availability of ICT resources and level of academic library automation. The analysis reveals that 5 out of 22 ICT resources namely Library Automation Software, networked server, LAN, CD-ROM Reader/Writer and CD/DVD Player has a significant positive relationship with the level of library automation at the 0.05 alpha level. The researcher, therefore, fail to accept the null hypothesis that there is no relationship between availability of ICT

resources and level of academic library automation.

Research Objective 2: Assess the effect of Internet connectivity on the automation of Sam Jonah library.

Table 10 depicts the Internet connectivity speed in Sam Jonah library.

Table 10: *Internet Connectivity Speed in Sam Jonah Library*

Internet Connectivity Speed	frequency	percentage
Very Fast	4	4.1
Fast	25	25.8
Slow	57	58.8
Very Slow	11	11.3
Total	97	100.0

Source: Field survey (2017)

Table 10 shows the response of the library staff on the Internet connectivity speed in the library. Fifty seven (58.8%) out of 97 staff indicated that the Internet connection speed in the Sam Jonah library is slow. Twenty five (25.8%) indicated fast Internet connectivity speed, 11 (11.3%) indicated very slow Internet speed and as few as 4 (4.1%) staff indicated the Internet connection speed as very fast. The analysis implies that sections within the library that use Internet in their operation will have challenges with their daily task such as delay in serving clients as indicated by Qutab, Bhatti and Ullah (2014) that Internet connection speed is relevant in retrieving timely information quickly.

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Table 11: *Library Automation Requiring Internet to Operate*

	frequency	percentage
Yes	84	86.6
No	3	3.1
Not aware	10	10.3
Total	97	100.0

Source: Field survey (2017)

Table 11 depicts that 84 (86.6%) of the library staff indicated that the library automation function with Internet. Ten (10.3%) indicated that they are not aware whether the library automation function with Internet. Only 3(3.1%) out of the 97 staff involved in the study indicated that the automation does not require Internet to operate. The above analysis is in support of Kumar and Jasimudeen (2012) assertion that the Koha automation software have some modules or functionalities that requires Internet to operate whereas others do not. For instance, the functionalities like circulation and Z39 for cataloguing books becomes impossible in the absence of Internet connectivity.

Table 12: *Crosstab of Section/Department and Internet Use*

Chi Square value = 170.635, p value = 0.000, S = 97

	Yes	No	Sometimes	Total
Section / Department	f (%)	f (%)	f (%)	f (%)
Acquisition	0 (0.0%)	8(100.0%)	0(0.0%)	8(100.0%)
Readers Service	20(100.0%)	0(0.0%)	0(0.0%)	20(100.0%)
Digital	7(87.5%)	0(0.0%)	1(12.5%)	8(100.0%)
RCAMAT	0 (0.0%)	4(57.1%)	3(42.9%)	7(100.0%)
Special Collection	0 (0.0%)	6(100.0%)	0(0.0%)	6(100.0%)
Cataloguing	11(100.0%)	0(0.0%)	0(0.0%)	11(100.0%)
Periodical	0 (0.0%)	0(0.0%)	13(100.0%)	13(100.0%)
Departmental library	0 (0.0%)	1(6.7%)	14(93.3%)	15(100.0%)
E-resource/ILL DD	3 (100.0%)	0(0.0%)	0(0.0%)	3(100.0%)
Reprographic/Bindery	0 (0.0%)	6(100.0%)	0(0.0%)	6(100.0%)
Total	41(42.3%)	25(25.8%)	31(32.0%)	97(100.0%)

Source: Field survey (2017)

From Table 12, the crosstab analysis was performed to find out if there is a relationship between the use of Internet and section/department of the Sam Jonah Library to perform their daily task. The analysis revealed that some section of the library uses Internet in their daily routine while some sections or

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departments do sometimes use or require no Internet at all. Among the sections that mostly use Internet for their operations are the readers service (100%), digital (87.5%), cataloguing (100%) and E-resources/ILLDD (100%). Sections/departments that do not require Internet at all in their operations are the reprographic/bindery (100%) and special collections (100%). The analysis further revealed that periodical section (l00%) and departmental libraries (93.3%) sometimes use the Internet for their daily routine.

In short, Table l2 shows that there is a relationship between Internet usage among sections or department of the Sam Jonah Library. This decision is based on the Chi-square value of l70.635 which is statistically significant at the 0.01 alpha level (thus, 0.000 < 0.01). According to Kumar and Jasimudeen (2012), the most favorite module in the Koha automation software used by its users is the circulation module. This module is used among the readers service section of the library. The digital section is responsible for digitizing hardcopy theses and uploading them including submitted e-copy of theses from the School of Graduate Studies and Research into the library institutional repository. The section makes use of Internet in the uploading of these materials. The cataloguing section uses the Z39 module in the Koha software which require Internet to catalogue new books acquired by the library. Lastly, the Electronic or ILL/DD section mainly use Internet in their operations in retrieving relevant literature or articles from the Internet for client use, as well as, making request for books or articles via email from other sister libraries in developed countries using the inter-library loan service.

Hypothesis 2

H$_0$: Availability of Internet connectivity cannot predict the use of Sam Jonah library automation.

The researcher adopted the binary logistic regression model to predict the availability of Internet connectivity on the use of library automation. Binary logistic regression predicts the likelihood that an event falls into one of two categories of a dummy dependent variable based on one or more predictor variables which can either be continuous or categorical (Pedace, 2013).

The binary logistic regression model below was used to predict the determinant for the use of library automation:

$$y_i = a_1 + a_2\ x_i + e \tag{1}$$

In the model above, y_i is the dependent variable representing library automation use. It is a dummy variable taking the value of 0 or 1. Library automation use is measured by the departments/sections in the library dependency on automation. The x_i is the independent variable representing Internet connectivity. It was measured by the departments/sections in the library use of internet to operate. The a_1 and a_2 represent the slope and coefficient of the independent variable respectively. The e is the error term. Table 12 shows the estimate of Internet connectivity on the use of library automation.

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Table 13: *Estimate of Internet Connectivity on the Use of Library Automation*

Binary logistic regression

Variables in the Equation			N = 97, r2 = 0.405			
	B	S.E.	Wald	df	Sg.	Exp(B)
Internet Connectivity (1)	3.080	.622	24.552	1	.000	21.750
Constant	-1.421	.298	22.785	1	.000	.241

Dependent variable: Use of library automation (1=Yes, 0=No)

Source: Field survey (2017)

From Table 13, the value of the Exp(B) reveals that when the Internet connectivity increases by one unit, the odds that the use of library automation is predicted by a factor of around 21.750 times, when other variables are controlled. There is a statistical significance (thus, 0.000 < 0.05) relationship between internet connectivity and the use of library automation at the 0.05 alpha level. The coefficient of determination (r^2) value of 0.405 indicates that about 40.5% variations in the use of library automation is explained by internet connectivity in library. The researcher, therefore, fail to accept the null hypothesis that availability of internet connectivity cannot predict the use of library automation.

Research Objective 3: Ascertain the ICT Training of Sam Jonah Library Staff on the Level of Academic Library Automation

Table 14 shows the ICT proficiency skills of the staff of Sam Jonah library.

Table 14: *ICT Proficiency of Sam Jonah Library Staff*

ICT Skills	No Skills		Little Skills		Proficient		Very Proficient	
	f	%	f	%	f	%	f	%
Basic computing skills (typing and MS Word)	1	1.0	29	29.9	37	38.1	30	30.9
Internet information retrieval skills	5	5.2	29	29.9	35	36.1	28	28.9
Digitization skills (scanning and uploading	25	25.8	31	32.0	29	29.9	12	12.4
Presentation skills i.e. PowerPoint	23	23.7	33	34.0	27	27.8	14	14.4
Graphic skills i.e. CorelDraw, Photoshop	51	52.6	42	43.3	3	3.1	1	1.0
Statistical application skills i.e. SPSS, Excel	41	42.3	37	38.1	18	18.6	1	1.0
Technical skills i.e. Repair and maintenance of computers	79	81.4	10	10.3	6	6.2	2	2.1
Software installation skills	40	41.2	28	28.9	24	24.7	5	5.2
Web 2.0 skills i.e. Blog creation	76	78.4	14	14.4	6	6.2	1	1.0
Website designing	95	97.9	1	1.0	1	1.0	0	0.0
Linux operating system	67	69.1	18	18.6	12	12.4	0	0.0
Windows operating system	3	3.1	38	39.2	42	43.3	14	14.4

Source: Field survey (2017)

Table 14 indicates ICT proficiency of Sam Jonah library staff. Regarding basic computing skills 37(38.1%) staff were proficient and 30(30.9%) very proficient. This indicates majority of the staff have very good basic computing skills. Also, majority of the staff have very good skills in Internet information

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retrieval as indicated by 35(36.1%) proficient and 30(30.9%) very proficient. Regarding the technical skills of staff, 79 (81.4%) had no skills. Furthermore, Table 14 reveals that 67(69.1%) staff had no skills in the use of Linux operating system and none (0.0%) of the staff indicated as very proficient in the use of Linux operating system. In conclusion, the majority of Sam Jonah Library staff are proficient in basic computing skills, Internet information retrieval and Windows operating system. However, either no staff or very few of the staff were found to be proficient with technical skills, web 2.0 skills, website designing and Linux operating system. No staff was found to be very proficient (expert) in the Linux operating system. The Koha automation software used by Sam Jonah library runs only on the Linux operating system. Hence, the absence of a very proficient (expert) staff in the use of Linux operating system as indicated in Table 14 becomes an issue of great concern especially with regards to good maintenance and fixing errors that may arise. This finding is similar to the works of Younis (2005), Suku and Pillai (2005), and Sharma (2007), who reported that the lack or unavailability of technical experts is a major problem in carrying out library automation project.

Table 15: *ICT Training on the Use of Library Automation*

Responses	Frequency	Percentage
Yes	71	73.2
No	26	26.8
Total	97	100.0

Source: Field survey (2017)

From Table 15, the analysis shows that 71 (73.2%) have received training on the use of the library automation while 26 (26.8%) have not. According to Ayoku and Okafor (2015) and Adeleke and Olorunsola (2010), library management must ensure that librarians are trained on ICT to be aware and also understand the new service dimension introduced through the use of ICT in libraries.

Table 16: *Sources of ICT Training of Sam Jonah Library Staff*

	Yes		No		Total	
	Count	Row N %	Count	Row N %	Count	Row N %
Library school	9	9.3	88	90.7	97	100
On the job staff training	84	86.6	13	13.4	97	100
Computer training school	30	30.9	67	69.1	97	100
Self learning	93	95.9	4	4.1	97	100
Qualification in Computer Science	4	4.1	93	95.9	97	100
Learnt from friends	71	74.7	26	25.3	97	100

Source: Field survey (2017)

Table 16 shows the sources of acquiring ICT training among Sam Jonah library staff. The result revealed that the most sources of acquiring ICT training among library staff were on the job staff training (86.6%) and self learning (95.9%). Also, only 4 (4.1%) out of the 97 sampled staff have qualification in computer science at the time of data collection.

Hypothesis 3

H₀: ICT training of Sam Jonah library staff cannot predict the level of academic library automation.

Table 17 shows the correlation between ICT training of the staff of Sam Jonah library and the level of library automation.

Table 17: *Correlation between ICT Training of Sam Jonah Library Staff and Level of Library Automation*

Correlations		ICT Training On Library Automation	Level Of Automation
ICT training on library automation	Pearson Correlation	1	.261**
	Sig. (2-tailed)		.010
	N	97	97
Overall level of automation	Pearson Correlation	.261**	1
	Sig. (2-tailed)	.010	
	N	97	97

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field survey (2017)

Table 17 shows the correlation analysis performed to ascertain the relationship between ICT training of Sam Jonah library staff and the level of automation. ICT Training is measured by the training of staff on library automation and level of automation is measured by the rating of automation level of Sam Jonah library by staff. The analysis showed that about 26.1% of variations in the level of automation is predicted by ICT training of Sam Jonah library staff. The significant value of 0.010 indicates a statistically significant (thus, 0.010 <

0.05) relationship between ICT training of Sam Jonah library staff and the level of academic library automation at the 0.05 alpha level. The researcher, therefore, fail to accept the null hypothesis that ICT training of Sam Jonah library staff cannot predict the level of academic library automation.

Research Objective 4: Assess the perception of library staff regarding automation of Sam Jonah library

The perception of library staff with respect to the automation of Sam Jonah library is depicted in Table 18.

Table 18: *Perception of Staff on the Automation of Sam Jonah Library*

Staff Perception	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%	f	%
Application of ICT in libraries is not librarians responsibility rather IT professionals need to do this	28	28.9	52	53.6	7	7.2	10	10.3	0	0.0
Application of ICT should be a high priority in our library	3	3.1	0	0.0	0	0.0	41	42.3	53	54.6
It is difficult for librarians to handle computer and other technologies	26	26.8	46	47.4	8	8.2	15	15.5	2	2.1
Library automation makes staff irrelevant as it replaces staff effort	30	30.9	53	54.6	10	10.3	2	2.1	2	2.1
Library automation makes information easily accessible	2	2.1	0	0.0	1	1.0	47	48.5	47	48.5
Not all staff needs training on library automation	42	43.3	41	42.3	5	5.2	7	7.2	2	2.1

Source: Field survey (2017)

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Table 18 depicts the perception of library staff regarding the automation of Sam Jonah library. It revealed that 52 (53.6%) staff disagree and 28 (28.9%) staff strongly disagree to the statement that application of ICT in libraries is not librarians responsibility rather IT professionals. This is an indication that majority of the staff hold the view that the application of ICT in libraries is the responsibility of librarians. Regarding the perception of staff on the application of ICT being a high priority in Sam Jonah library, 53(54.6%) staff strongly agree, followed by 41(42.3%) staff who also indicated that they agree. This shows that majority of the staff have the perception that ICT must be a high priority of management in Sam Jonah Library. Furthermore, table 18 indicates that majority of the staff 53(54.6%) disagree and the 30(30.9%) strongly disagree to the view that library automation makes staff irrelevant as it replaces staff. Lastly, Table 18 revealed that 42(43.3%) staff strongly disagree and 41 (42.3%) disagree to the assertion that not all staff needs training on library automation. That means, majority of the staff of Sam Jonah library hold the view that every library staff must have some training regarding the automation of the library.

This finding is in support of Carnoy (1999) assertion that the challenge faced in developing countries does not have to do with purchasing hardware or software for new technologies adopted but rather the training of the staff to accept and effectively use those technologies and contradicts Sharma's (2007) finding that there are some library staff that are conservative with regards to technology and therefore have developed some fear towards the use of technology. The

analysis, therefore, concludes that the library staff have a positive perception regarding automation of Sam Jonah library.

Hypothesis 4

H₀: There is no difference in Sam Jonah library staff perception on academic library automation.

Analysis of staff perception on library automation is shown in Table 19.

Table 19: *ANOVA Test for Staff Perception on Academic Library Automation*

		Sum of Squares	Df	Mean Squares	F	Sig.
Application of ICT in libraries is not librarians responsibility rather IT professionals need to do this	Between Groups	6.050	2	3.025	4.125	.019
	Within Groups	68.939	94	.733		
	Total	74.990	96			
It is difficult for librarians to handle computer and other technologies	Between Groups	.617	2	.309	.269	.765
	Within Groups	108.042	94	1.149		
	Total	108.660	96			
Library automation makes staff irrelevant as it replaces staff effort	Between Groups	2.196	2	1.098	1.645	.199
	Within Groups	62.773	94	.668		
	Total	64.969	96			
Library automation makes information easily accessible	Between Groups	1.405	2	.703	1.373	.258
	Within Groups	48.100	94	.512		
	Total	49.505	96			
Not all staff needs training on library automation	Between Groups	.178	2	.089	.093	.911
	Within Groups	89.842	94	.956		
	Total	90.021	96			

Source: Field survey (2017)

From Table 19, a one-way between groups analysis of variance was conducted to explore the category of staff perceptions on academic library automation. Participants were divided into three group's namely junior staff, senior staff and senior members. There was a statistically significant difference at the $p < 0.05(0.019 < 0.05)$ at the 0.05 alpha level in the statement "application of ICT in libraries is not librarians' responsibility rather IT professionals need to do this" for three staff groups with $F (2, 94) = 4.125$, $p < .05$. Despite reaching statistical significance, the actual difference in mean scores between groups was quite small. The effect size, calculated using eta squared, was .08. Post-hoc comparisons using the Tukey HSD (Appendix C) test indicated that the mean score for junior staff (M = 2.38, SD = .875) was significantly different from senior staff (M = 1.81, SD = .800). There was no statistically significant difference in mean scores between senior staff and senior members. The other four perceptions of library automation against staff category were not statistically significant, therefore, the researcher fail to reject the null hypothesis that there is no difference between staff category and perception of academic library automation.

Research Objective 5: Determine the perception of clients regarding their level of satisfaction of the automation of Sam Jonah library.

Table 20 depicts the various services accessed by clients of Sam Jonah library.

Table 20: *Services Accessed by Clients of Sam Jonah library*

Service	Yes		No		Total	
	f	%	f	%	f	%
Borrowing of books	72	22.4	250	77.6	322	100.0%
Reference service	187	58.1	135	41.9	322	100.0%
Internet/Wi-fi	259	80.4	63	19.6	322	100.0%
Photocopying	123	38.2	199	61.8	322	100.0%
OPAC (Online Catalogue)	37	11.5	285	88.5	322	100.0%
E-resources/Online databases	71	22.0	251	78.0	322	100.0%
Institutional repository	50	15.5	272	81.5	322	100.0%
Library website	53	16.5	269	83.5	322	100.0%

Source: Field survey (2017)

According to Table 20, the analysis revealed that the most highly accessed service by clients of Sam Jonah library is the Internet/Wi-fi availability indicated by 259 (80.4%) of the respondents. This might be due to the open access to this facility without any login or password requirement. This is followed by the reference service and photocopying service also indicated by 187 (58.1%) and 123 (38.2%) respectively. Table 20 on the other hand, shows that the OPAC is the least accessed service indicated by 37 (11.5%) out of the 322 clients of Sam Jonah library used for the study. This is followed by the

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institutional repository and library website, which are indicated by 50 (15.5%) and 53 (16.5%) respectively. These services which are not highly patronized by the clients may be due to the lack of user education to equip clients with competent skills to use them.

Table 21: *Clients Satisfaction Level of the Automation of Sam Jonah Library*

Level of Satisfaction	Frequency	Percentage
Highly Satisfied	14	4.3
Moderately Satisfied	174	54.0
Satisfied	61	18.9
Not Satisfied	73	22.7
Total	322	100.0

Source: Field survey (2017)

From Table 21, the analysis of data collected on the level of satisfaction of clients regarding automation of Sam Jonah library revealed that 174 (54.0%) of client were moderately satisfied and only 14 (4.3%) out of the 322 respondents indicated that they were highly satisfied. This indicates that more than half of the clients of Sam Jonah library are moderately satisfied with the services provided by the library.

Hypothesis 5:

H₀: There is no difference in clients' satisfaction of Sam Jonah library automation services.

The analysis of client's satisfaction of Sam Jonah library automation services is shown in Table 22.

Table 22: *ANOVA Test for Clients' Satisfaction of Automated Services of Sam Jonah Library*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.803	2	.402	.512	.600
Within Groups	250.516	319	.785		
Total	251.320	321			

Source: Field survey (2017)

From Table 22, a one-way between groups analysis of variance was conducted to explore the category of library clients on the satisfaction of the automated services of the Sam Jonah library. Participants were divided into three groups namely undergraduate students, post graduate students and lecturers/researchers. There was no statistically significant difference at the $p < 0.05$ alpha level in client satisfaction of Sam Jonah library automation services for the three client groups $F_{(2, 319)} = 0.512$, $p > 0.05$. The researcher, therefore, fail to reject the null hypothesis that there is no difference between client satisfaction and the automated services of the Sam Jonah library.

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Summary

In this chapter, the collected data were analyzed and interpreted in accordance with the research objectives. The major findings were that the ICT resources used in the automation of Sam Jonah library are inadequate and low to meet the demands of the students, lecturers and staff of the university. However, the study shows that there is statistically significant relationship between availability of ICT resources and level of academic library automation.

The study also indicated that there was either delay or a halt in service delivery due to slow Internet speed or Internet connection going down. This could be explained that the availability of Internet connectivity predicts the use of library automation.

Moreover, the study revealed that there was no staff in Sam Jonah library with expert knowledge and skills in the Linux operating system, which is the platform on which the automation software runs on. ICT training of Sam Jonah library staff was found to be a determinant to predict the level of academic library automation. Furthermore, the study showed that the staff of Sam Jonah library have positive perception regarding the library automation. This was revealed by the ANOVA analysis that there is no statistically significant difference between staff groups and perception of academic library automation.

Finally, the study indicated more than half of the clients of Sam Jonah library are moderately satisfied with the automated services provided. This is further supported by the ANOVA analysis indicating that there is no difference between clients' satisfaction and automated services of Sam Jonah library.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter looks at the summary of findings, the conclusions and recommendations. The findings were those important issues about ICT deployment and level of academic library automation in University of Cape Coast that were discovered through the analysis of the field data collected through the questionnaires administered. The conclusion deals with a summary of the entire research work. The recommendation was based on objectives set for this research and issues that were identified during the field work.

Summary

The main objective of the study was to explore the rate of ICT deployment and level of academic library automation in University of Cape Coast. The study focused on only one academic library in Ghana that is the Sam Jonah Library and this was due to the limited time available for the research and also financial constraints to do an extensive study. Specifically, the study intended to determine the availability of ICT resources used in the automation of Sam Jonah library, assess the effect of Internet connectivity on automation in the Sam Jonah library, explore the perception of staff on the automation of Sam Jonah library and to determine the perception of clients regarding their level of satisfaction of the automation of Sam Jonah library. A total sample size of 419 was used for the study consisting of 97 staff of the Sam Jonah library as well as 322 clients who use the library facilities. Purposive sampling and disproportionate stratified

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random sampling were adopted to select the staff and the clients respectively. The main data collection instrument used for the study was a questionnaire. The data collected were coded and analysed into frequencies, percentages and cross-tabulation using SPSS software version 21. The following emerged as the key findings from the study:

1. The study revealed that there are several ICT resources deployed in the Sam Jonah Library such as computers, library automation software, network server, network printer, local area network, CD-ROM writer, bar code printer, CD/DVD player, book scanner for digitization, book theft detections system, Photocopying machines, Uninterruptible Power Supply (UPS) and inverters, etc. However, the analysis indicated that most of these ICT resources were inadequate or low in number. The absence of CCTV cameras within the Sam Jonah library raised the question of loosed security in the protection of library assets and resources. Also, the bad condition of the library's generator affects the service delivery in events of general light off.

2. The study also found out that the Internet connectivity is crucial in the use of Sam Jonah library automation.

3. The study revealed that majority of Sam Jonah Library staff had very good basic computing skills, Internet information retrieval skills and conversant with the use of windows operating system. However, most of the staff lacked technical skills, web 2.0 skills, website designing skills and had low skills in the use of Linux operating system. ICT

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training of staff has also been established to be a determinant of the level of academic library automation.

4. The study also found out that the library staff had positive perception regarding the automation of Sam Jonah library and this is crucial to the sustainability of ICT resources deployed in the automation project of the library.

5. The overall assessment of clients' satisfaction of the automated services of Sam Jonah library of the University of Cape Coast was moderate. However, this could be improved by deploying more ICT resources into the operations of the university academic library and educating users about them.

Conclusions

Academic libraries are using ICT resources to automate a wide range of their operations, as well as, building databases and networks to provide better services to their users. ICT deployment in academic libraries help to provide a sustainable environment to meet the challenges of informational needs of library users brought up by the emergence of new technologies. The availability of ICT resources in academic libraries facilitates the free flow of information for client satisfaction. Thus, academic libraries must ensure the durability of the resources used in the library and also provide adequate security to protect the safety of the resources used in providing information and efficient service.

ICT has brought great opportunities to enable academic libraries fulfill their goal of providing their users with relevant, quick and up-to-date information

through the deployment of ICT resources in their operations. The Internet has globally been acknowledged as the foundation for the transformation of knowledge in this digital era. This potential of enabling access, organizing and disseminating information makes Internet connectivity very crucial in academic libraries. Therefore, academic libraries should acquire bigger bandwidth or higher Internet connection speed to enable them fulfill their core objective of providing support to the teaching, learning and research agenda of universities.

Lastly, improving performance or service delivery of academic libraries require paying attention to the key features by which users access the services rendered by libraries. This involves commitment from the university, the library management and staff.

Recommendations

Based on the findings and conclusions drawn from the study, the following recommendations are made to guide the ICT deployment and the level of academic library automation of the University of Cape Coast.

1. The Sam Jonah Library management should ensure that more ICT resources such as computers are acquired to meet the demands of clients. A more robust set of computers in terms of durability should be purchased to avoid frequent breakdowns of computers.

2. The Sam Jonah Library management should provide a robust standby generator to offset the unfavorable effects of power outage. This is relevant because ICT usage has total dependence on electric power.

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3. The Sam Jonah Library management should install a more comprehensive security check systems at vantage areas or sections of the library to monitor the day to day activities, as well as, serve as a check against theft of library assets and clients belongings.

4. The Sam Jonah Library management should see to the acquisition of bigger bandwidth or high speed Internet connectivity in the library to ensure quick service delivery.

5. The Sam Jonah Library management should collaborate with the Human Resource Section of the University of Cape Coast to employ ICT experts or professionals who will ensure proper management and maintenance of the automation projects or the Library management should collaborate with the Training and Development Section of the University of Cape Coast to either sponsor or give professional training to some library staff to upgrade their knowledge and skills through.

6. The Sam Jonah library management should be organized regular internal workshops/seminars for all library staff to keep them abreast with new technologies employed in the automation of the library. However, the training should not only start and end with workshops/seminars organised, opportunities should be created for staff to apply the knowledge gained.

7. The library management should seek for sponsorship from both local and international donor agencies, as well as, individuals to raise funds for the acquisition of modern ICT facilities for improved library services.

8. The Sam Jonah library should increase its user education to reach more of clients (undergraduates, post graduates, lecturers and university staff) to ensure that these users have good skills to use the ICT resources available.

Suggestion for Further Research

This study was limited to Sam Jonah library of the University of Cape Coast. A similar study in all academic libraries in Ghana would bring out the bigger picture of ICT deployment and the level of academic library automation.

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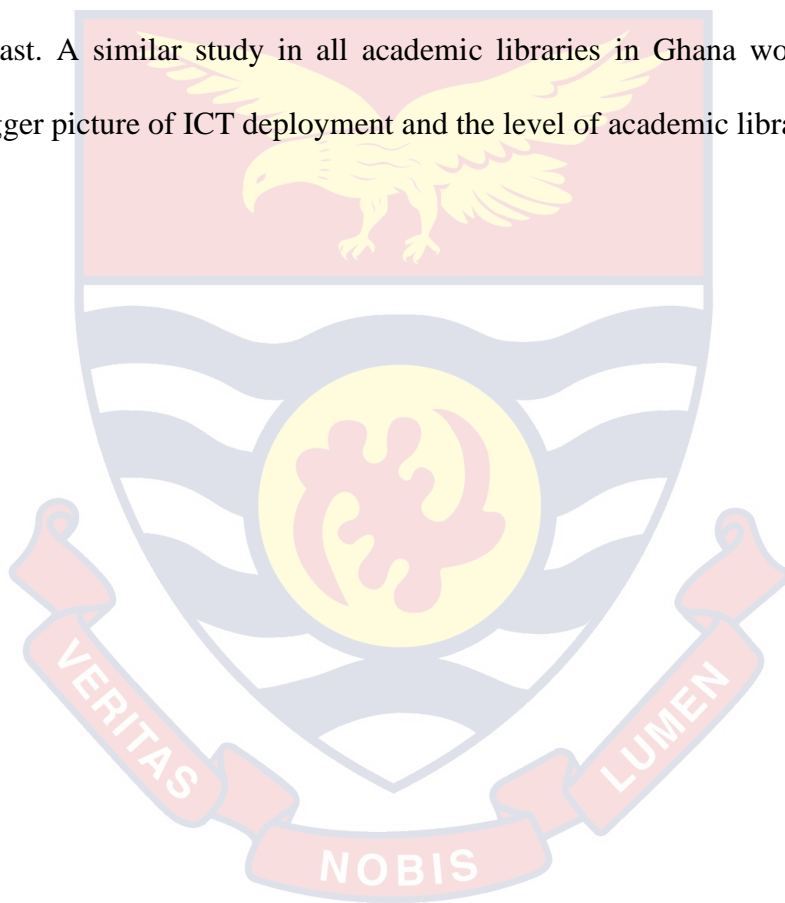
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APPENDICES

APPENDIX A

STAFF QUESTIONNAIRE
COLLEGE OF DISTANCE EDUCATION
UNIVERSITY OF CAPE COAST

SECTION A: BACKGROUND INFORMATION

1. Gender

   Male   [   ]   Female [   ]

2. Age

   20 – 29 [   ]   30 – 39 [   ]   40 – 50 [   ]   50 and above [   ]

3. Please indicate your section/department

   Acquisition   [   ]   Cataloguing   [   ]

   Readers service   [   ]   Periodicals/Serials   [   ]

   Digital   [   ]   Departmental library   [   ]

   RCAMAT   [   ]   E-resource/ ILL/DD   [   ]

   Special Collection   [   ]   Reprographic/Bindery   [   ]

4. Staff category

   Junior staff [   ]   Senior staff [   ]   Senior member [   ]

5. How long have your worked in the library

   1 – 5 [   ]   6 – 10 [   ]   11 – 15 [   ]   16 – 20 [   ]   Above 20 [   ]

SECTION B: ICT RESOURCES FOR AUTOMATION

6. Please tick [√] the ICT resources available in Sam Jonah Library?

ICT Resource	Yes	No	Quantity		Condition		
			Adequate	Not Adequate	Good	Fairly good	Bad
Computers							
Library automation software							
Networked Server							
Network Printer							
Scanners							
Local Area Network (LAN)							
Projector							
External hard drive/ Backup drives							
Smart TV							
Microfilm reader							
Bar code readers/scanners							
Bar code printers							
Book scanner for digitization							
CD-ROM Reader/writer							
Security gate for book check system							
CC TV Cameras							
Photocopying machines							
Digital Cameras							
Generator to supply electricity whenever there is load shading							
Uninterruptible Power Supply (UPS)							
CD/DVD player							
Inverter							
Other (Specify)							

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SECTION C: IMPACT OF INTERNET CONNECTIVITY ON

AUTOMATION

7. Is there Internet connectivity in the library?
   Yes [   ]   No [   ]   Not aware [   ]
8. What is the speed of your Internet connectivity?
   Very fast [   ] Fast [   ]   Slow [   ]   Very slow [   ]
9. Does the library automation software require Internet to operate?

   Yes [   ]   No [   ]   Not aware [   ]
10. Does your section require Internet to operate?

    Yes [   ]   No [   ]   Sometimes [   ]
11. Does your section depend on the use of automation?
    Yes [   ]   No [   ]

12. Can the library OPAC (Online Catalogue) be accessed on the web or outside the library?
    Yes [   ]   No [   ]   Not aware [   ]

SECTION D: STAFF ICT PROFICIENCY

13. Please indicate by way of ticking [√] in the right column, the extent of

    your ICT proficiency.

ICT Skills	No Skills	Little Skills	Proficient	Very Proficient
Basic computing skills i.e. typing and MS Word				
Internet information retrieval skills				
Digitization skills i.e. scanning and uploading				
Presentation skills i.e. PowerPoint				
Graphic skills i.e. CorelDraw, Photoshop				
Statistical application skills i.e. SPSS, Excel				
Technical skills i.e. Repair and maintenance of				
Software installation skills				
Web 2.0 skills i.e. Blog creation				
Website designing				
Linux operating system				
Windows operating system				

14. Where did you acquire your ICT skills?

Library school	Yes [ ]	No [ ]
On the job staff training	Yes [ ]	No [ ]
Computer training school	Yes [ ]	No [ ]
Self learning	Yes [ ]	No [ ]
Qualification in computer science	Yes [ ]	No [ ]
Learnt from friends	Yes [ ]	No [ ]

15. Have you received any ICT training in the use of the library automation software?

Yes [   ] No [   ]

SECTION E: STAFF PERCEPTION OF AUTOMATION

16. Which of the following best describe library automation?

i.   Library automation is the use of computers/computer-based tools in the operation of routine task performed by library staff   [   ]

ii. Library automation is the total replacement of library staff with computers and computer technologies in the library   [   ]

iii. Library automation is the use of only computers in the provision of library services   [   ]

17. Please indicate by ticking [√] the level of agreement or disagreement to the following statements

Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Application of ICT in academic libraries is not librarians responsibility rather IT professionals need to do this					
Application of ICT should be a high priority in our academic libraries					
It is difficult for librarians to handle computer and other technologies					
Academic library automation make staff irrelevant as it replaces staff efforts					
Academic library automation makes information easily					

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accessible					
Not all staff need training on library automation					

18.   Please tick [√] the level of automation for the following library operations

Acquisition   Fully automated [   ] Partially automated [   ]

Beginning stage [   ]

Circulation   Fully automated [   ] Partially automated [   ]

Beginning stage [   ]

Cataloguing   Fully automated [   ] Partially automated [   ]

Beginning stage [   ]

Periodicals   Fully automated [   ] Partially automated [   ]

Beginning stage [   ]

ILL/DD   Fully automated [   ] Partially automated [   ]

Beginning stage [   ]

Reference Service   Fully automated [   ] Partially automated [   ]

Beginning stage [   ]

19.   Please indicate the overall level of automation of Sam Jonah library operations?

Fully automated [   ] Partially automated [   ]   Beginning stage [   ]
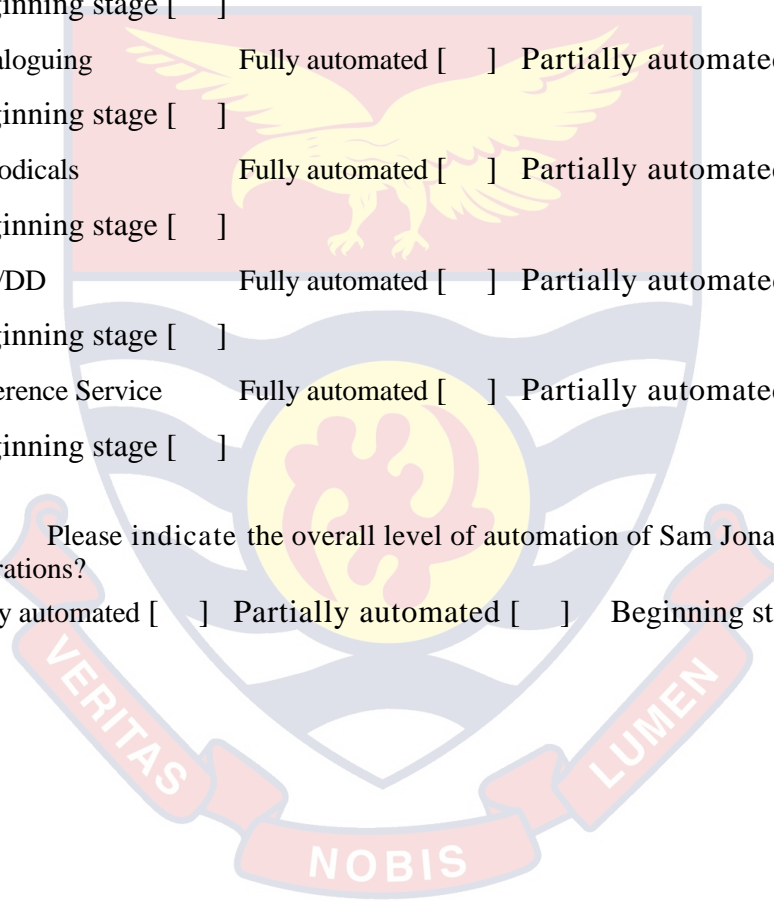
APPENDIX B

QUESTIONNAIRE FOR LIBRARY CLIENTS

SECTION A: BACKGROUND INFORMATION

1. Gender

   Male   [   ]   Female [   ]

2. Age

   18 – 29 [   ]   30 – 39 [   ]   40 – 50[   ]   50 and above [   ]

3. Please tick [√] only one of the following that most applies to you

   Undergraduate   [   ]

   Post Graduate   [   ]

   Faculty/Lecturer   [   ]

SECTION B: LIBRARY USAGE AND SERVICE SATISFACTION

4. Is the Sam Jonah library (UCC) automated? Yes [   ]   No [   ] Not aware [   ]

5. If yes, which automation software does the library use …………………..

6. Please tick the services you have accessed from the library

   Circulation (Borrowing books)   [   ]

   Reference service   [   ]

   Internet services/Wi-Fi   [   ]

   Photocopying service   [   ]

   OPAC (Online Catalogue)   [   ]

   E-resources/Online databases   [   ]

   Institutional repository   [   ]

   Library website   [   ]

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7. Please read each statement and tick [√] what best describes your opinion

|	Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
8	It is easy to use the OPAC (online catalogue)					
9	I spend a lot of time when borrowing from the library					
10	I spend a lot of time when returning a borrowed book					
11	The library's website is user friendly					
12	The library website provides adequate information on what I need					
13	It is easy to find information from the institutional repository					

8. Please indicate your level of satisfaction of the automated services of the

library

Highly satisfied [   ] Moderately satisfied [   ]   Satisfied [   ]

Not satisfied [   ]

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APPENDIX C

Post Hoc analysis of staff perception of library automation
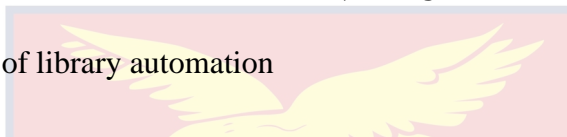
Descriptives

Perception of library automation

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Application of ICT in libraries is not librarians responsibility rather it professionals need to do this	Junior Staff	24	2.38	.875	.179	2.01	2.74	1	4
	Senior Staff	63	1.81	.800	.101	1.61	2.01	1	4
	Senior Member	10	2.20	1.135	.359	1.39	3.01	1	4
	Total	97	1.99	.884	.090	1.81	2.17	1	4
Application of ICT should be a high priority in our library	Junior Staff	24	4.17	.816	.167	3.82	4.51	1	5
	Senior Staff	63	4.51	.801	.101	4.31	4.71	1	5
	Senior Member	10	4.80	.422	.133	4.50	5.10	4	5
	Total	97	4.45	.791	.080	4.29	4.61	1	5
It is difficult for librarians to handle computer and	Junior Staff	24	2.29	.999	.204	1.87	2.71	1	4
	Senior Staff	63	2.13	1.055	.133	1.86	2.39	1	5

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other technologies	Senior Member	10	2.30	1.337	.423	1.34	3.26	1	5
	Total	97	2.19	1.064	.108	1.97	2.40	1	5
	Junior Staff	24	1.96	.751	.153	1.64	2.28	1	3
Library automation makes staff irrelevant as it replaces staff effort	Senior Staff	63	1.81	.692	.087	1.64	1.98	1	5
	Senior Member	10	2.30	1.494	.473	1.23	3.37	1	5
	Total	97	1.90	.823	.084	1.73	2.06	1	5
	Junior Staff	24	4.50	.590	.120	4.25	4.75	3	5
Library automation makes information easily accessible	Senior Staff	63	4.33	.783	.099	4.14	4.53	1	5
	Senior Member	10	4.70	.483	.153	4.35	5.05	4	5
	Total	97	4.41	.718	.073	4.27	4.56	1	5
	Junior Staff	24	1.88	.992	.202	1.46	2.29	1	4
Not all staff needs training on library automation	Senior Staff	63	1.79	.919	.116	1.56	2.02	1	5
	Senior Member	10	1.90	1.287	.407	.98	2.82	1	5
	Total	97	1.82	.968	.098	1.63	2.02	1	5

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Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Library Staff Category	(J) Library Staff Category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Application of ICT in libraries is not librarians responsibility rather it professionals need to do this	Junior Staff	Senior Staff	.565*	.205	.019	.08	1.05
		Senior Member	.175	.322	.850	-.59	.94
	Senior Staff	Junior Staff	-.565*	.205	.019	-1.05	-.08
		Senior Member	-.390	.292	.377	-1.08	.30
	Senior Member	Junior Staff	-.175	.322	.850	-.94	.59
		Senior Staff	.390	.292	.377	-.30	1.08
It is difficult for librarians to handle computer and other technologies	Junior Staff	Senior Staff	.165	.257	.798	-.45	.78
		Senior Member	-.008	.404	1.000	-.97	.95
	Senior Staff	Junior Staff	-.165	.257	.798	-.78	.45
		Senior Member	-.173	.365	.884	-1.04	.70
	Senior Member	Junior Staff	.008	.404	1.000	-.95	.97
		Senior Staff	.173	.365	.884	-.70	1.04
Library automation makes staff irrelevant as it replaces staff effort	Junior Staff	Senior Staff	.149	.196	.729	-.32	.62
		Senior Member	-.342	.308	.510	-1.07	.39
	Senior Staff	Junior Staff	-.149	.196	.729	-.62	.32
		Senior Member	-.490	.278	.188	-1.15	.17

	(I)	(J)	Mean Diff	Std. Error	Sig.	Lower	Upper
	Senior Member	Junior Staff	.342	.308	.510	-.39	1.07
		Senior Staff	.490	.278	.188	-.17	1.15
Library automation makes information easily accessible	Junior Staff	Senior Staff	.167	.172	.597	-.24	.58
		Senior Member	-.200	.269	.739	-.84	.44
	Senior Staff	Junior Staff	-.167	.172	.597	-.58	.24
		Senior Member	-.367	.244	.293	-.95	.21
	Senior Member	Junior Staff	.200	.269	.739	-.44	.84
		Senior Staff	.367	.244	.293	-.21	.95
Not all staff needs training on library automation	Junior Staff	Senior Staff	.081	.235	.936	-.48	.64
		Senior Member	-.025	.368	.997	-.90	.85
	Senior Staff	Junior Staff	-.081	.235	.936	-.64	.48
		Senior Member	-.106	.333	.945	-.90	.69
	Senior Member	Junior Staff	.025	.368	.997	-.85	.90
		Senior Staff	.106	.333	.945	-.69	.90

*. The mean difference is significant at the 0.05 level.

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