

**Information Communication Technology Skills, Information Literacy Skills and  
Electronic Library Patronage of Students in Public Polytechnics in Osun State,  
Nigeria**

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Faculty of Communication and Information Science, Lead City University, Ibadan,  
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Library and Information Science**

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## Certification

This is to certify that Adebayo Oluwasegun **ADEYEMO** with matriculation Number **LCU/PG/001895** carried out this research work titled "**Information Communication Technology Skills, Information Literacy Skills and Electronic Library Patronage by Students in Public Polytechnics in Osun State, Nigeria.**" in the Department of Information Management, Faculty of Communication and Information Science, Lead City University, Ibadan, Oyo State, Nigeria, for the Award of Master Degree in Library and Information Science (MLIS) and this has not been previously submitted.

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## **Dedication**

This dissertation is dedicated to the glory of God the Father, Son and Holy Spirit.

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## Abstract

The purpose of this study is to investigate Information Communication Technology Skills, Information Literacy Skills and Electronic Library Patronage by Students in Public Polytechnics in Osun State, Nigeria. This study was underpinned with the Diffusion of Innovation Theory (DOI), while the study's population comprised National Diploma (ND) students of three selected polytechnics in Osun State, Nigeria. The study employed cross-sectional survey design. The sample size for the study was five hundred and sixty-one (561) students. Questionnaires was the instruments of data collection. Response rates of 53.7% was obtained. The reliability of the instrument was carried out through pilot study using 30 copies of questionnaire. The Cronbach alpha yielded a result of 0.86. The research questions were analyzed using frequency and percentage distribution while the hypotheses were tested using regression analysis. Findings revealed that the electronic information resources and electronic database is the reason student highly patronized Polytechnic Libraries in Osun State, Nigeria. Also, the findings of this study revealed that the ICT and Information Literacy Skills of Students of Public Polytechnics in Osun State is high. The study recommended that Library management should provide more ICT facilities and more training should be organized for the students.

**Keywords:** ICT Skills, Information Literacy skills, Electronic Library Patronage, Polytechnics, Osun State, Nigeria

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## **Chapter One**

### **Introduction**

#### **1.1 Background to the Study**

Academic libraries exist to provide specialized information services and resources to members of the academic community where it is situated<sup>6</sup>. It is indeed the primary source of information to students, faculty, staff and the entire academic community due to the fact that its resources and services satisfied the academic and curricular needs of members of the institution. It acts as vehicle for disseminating information and the related computer technologies through the best practices for utilization by its community of users and also for the exchange of information among its users.

Tertiary institution libraries are at the centres of transforming it user's academic performance. Libraries must serve groups of users with diverse information resources, research techniques and at the same time attract users to patronizing the library. In addition, to the challenges facing most libraries such as internet and modern infrastructure, libraries must also confront a rapidly changing educational and e-publishing environment, in which the value and cost of a Polytechnic education is being questioned. A higher demand for current information resources and per year acquisition of resources to encourage users (students) in patronizing libraries which means libraries must prove their value and the value of the education system. Several institutions have attempted to assess the impact of academic libraries on student success but have often struggled with patron privacy concerns. In a study on polytechnic libraries about the statistical analysis of library user's patronage in ascertaining the success of user's performance during and after semester session, the study found that "there are statistically relevant data showing students' uses library much frequently than other three (3) categories of users, which are staff, researchers and community users<sup>1</sup>.

Library patronage depends on the resources, conduciveness and services rendered to library users<sup>2</sup>. The user is very critical to the services of a library, hence the user of a library must be constantly asked to assess the services and resources provided, as this will help the library to improve upon its services. The library is a vital part of the world's system of education and information storage and retrieval that makes books films, recordings and other media of knowledge available to people in an organized manner<sup>3</sup>.

Library is a repository of knowledge or an intellectual storehouse serving as a giant memory to mankind. One of the major roles expected of a library is to promote and facilitate effective use of recorded information in all formats by all library's clientele. Librarianship's main purpose was to promote effective academic action through making knowledge available through efficient bibliographic control and through a rapid and effective dissemination of information<sup>4</sup>.

A library provides electronic resources for knowledge acquisition, recreation, personal interest and inter-personal relationship for all categories of users. These resources are those referred to as those information bearing materials that are in both printed and electronic formats such as textbooks, journals, indexes, abstracts, newspapers and magazines, reports, CD-ROM databases, internet, Email, video tapes, cassettes, diskettes magnetic disk, computers, microforms and others<sup>5</sup>. Libraries clientele get satisfaction when information materials which are of greater value are delivered without much delay.

Library should “provide varied authoritative and up to date resources that support its mission”. Library of today “should not merely store documents and preserve them, it must also device means by which the contents of such documents can be rapidly and effectively transmitted for use. E-libraries offer such benefits as equitable access to information, reduced barriers of distance, timeliness, shared resources and content delivery. The mission of e-library is to provide both information services and resources that are capable

of meeting the research, teaching and learning needs of students. Of course, academic researchers see e-library as research Centre and intellectual energy house where knowledge, ideas and directions are generated to achieve research goals of the polytechnics. E-libraries are designed to enhance the accessibility of information where users can browse information electronically in a digital environment via local area network (LAN), campus back bone (Intranet) or Internet. E-libraries use advanced information technologies, such as information retrieval, multimedia communication and information visualization. Digital libraries bridge the lack of integration that exists between library systems and other kinds of information resources such as document databases (text or multimedia) and structured databases. Their advantages include: access to information that might be restricted to the user due to geographical location or finances, access to more current information, and provision of extensive links to additional resources related contents<sup>7</sup>.

Hence, the user of a library must be constantly asked to assess the services and resources provided, as this will help the library to improve upon its services. No matter how large the stock of a library is, if the services and its resources are not fully utilized, such a library will end up as a waste of resources. To encourage electronic Library patronage, usage of electronic database aids easy access and reduces the time spent while searching for materials compared to traditional service method<sup>6</sup>. It has been commonly accepted and proven that ICT is the engine of the 21st century and beyond". With regard to the discussion above, frequency of use of library and purpose of use of library will be used as measure for electronic library patronage.

E-libraries have been the prerogative of the developed world, and due to the advancements and affordability in computer and communication technology, they are, though slowly, getting importance in other countries. The transition from print to electronic medium, apart from resulting in a growth of electronic information, has provided users with new tools and applications for information seeking and retrieval. Electronic resources are invaluable research tools that complement the print-based resources in a traditional library setting. This rapid emergence and development of electronic information technologies, therefore, make it possible to envision radically different ways of organizing the collections and services the library has traditionally provided.

Information and Communication Technology (ICT) is the main factor that facilitate electronic library. Therefore, ICT skill is seen as “whatever a person needs to know and do with electronic devices in order to function competently in our information-based society. However, to become familiar with electronic devices, one must first have access to them. Generally, these skills can be learned in school, Information Technologies dominate all academic levels in the world. In recent years, computer information systems have experienced substantial growth and consequently, attaining acceptable literacy levels has become a necessity. An institution’s literacy ultimately affects what actions its members are capable of, as well as how they coordinate and integrate their efforts<sup>8</sup>. Furthermore, students are part of the new reality, they look for ways to cope with it and to share their understanding of the surrounding environment. The rapid changes in technology “have changed the way of life, works and communication globally. The successful adoption of information technology in education sector, however, depends on both the nature of the tasks within the institution<sup>9</sup>. Therefore, ICT skills among students and librarians is crucial in performing works as the world is embracing technological driven industrial revolution.

ICT skill is said to be respondent self-perception in relation to their level of knowledge about computers skills and understanding regarding computer and the ability to manage electronic resources and use common computer software applications. The common computer software includes Word Processor (MS Word), Spreadsheet (MS Excel), Web Browser (Internet Explorer) Presentations (MS PowerPoint), and Communication tools (e-mail). Computers are constantly being used in every profession and that makes it significant for students to have the skill in other to do their work well<sup>10</sup>. To have ICT skill, students must be able to confidently know enough about the way a computer could be operated to ensure improvement in the use of electronic resources in the library. The world is progressively branded by technology driven communication, which has converted the world into a large global connected village with ever-increasing outreach of Information and Communication Technology (ICT)<sup>11</sup>.

These advancements in communication technologies have led to the need for students to reposition themselves in other to continue to be relevant in electronic resources as well as cope with the trend of technological changes in today's academics. The modern world of high technology could not have come about except for the development of computer. Information technology has opened up a new era in managing information/communication through the techniques of automation and this has enhanced communication systems. Information technology has made e-library more competitive. One of the main causes of poor performance among students in most polytechnics is their inability to make use of library resources especially the electronic resources. Lack of skills in the use of electronic library has been a cause of worry to the management of the institutions due to students' academic performance.

This technology is consistently playing an important role in the lives of people, and it is imagined that these ICT skills will sooner or later become a ticket or requirement for basically whatever people do in terms of education". The measures to be used for ICT skills are ICT usage, computer availability, use of internet technology and use of Microsoft word and other packages<sup>12</sup>. By and large, ICT skills would be considered under the following measures; the ICT usage, Computer availability, Use of Internet technology, Use of Microsoft word facilities. It is not enough to acquire ICT skills; in order for students to have the information to excel in their study, they need the right information at the right time, in the right place, in the right form, and of sufficient completeness and quality to perform the current activity.

Therefore, it is important to have the right literacy digitally so as to make access to information an easy one. Information can be defined as any data that can be stored in digital form, including text, numbers, images, video or movies, audio, software, algorithms, equations, animations, models, simulations etc.<sup>13</sup>. Information comes in "several varieties, so it can be observational, computational, and experimental<sup>14</sup>.

Information literacy is the ability to recognize when information is needed and to have the ability to locate, evaluate, and use effectively the needed information and information literacy encompasses knowledge of one's information concerns and needs, and the ability to identify locate, evaluate, organize and effectively create, use and communicate information to address issues or problems on hand<sup>15</sup>. It is a prerequisite for participating effectively in the information world". Information literacy embraces all kinds of information: electronic, non-electronic and verbal<sup>17</sup>. Research has shown that information users (students) often seek for information in libraries and through library databases

without getting what they need<sup>18</sup>. To attain information literacy, it is necessary for one to remember to ask for assistance about the information needed". The search for the information is what will bring the results. Information professionals are happy and poised to help with any question's information users may have<sup>19</sup>. This desire to serve the user however may sometimes be hampered by lack of information literacy programmes to deliver excellent service.

Academic communities need to map out systematic ways of bringing about the desired literacy. The measures of information literacy are; defining the kind of information needed, locating the right information, selection of appropriate information, organising the information, presentation of information and accessing the information need to be conducted to bring about this state of enhanced capacity to use the information facilities and achieve maximum benefit<sup>20</sup>. To have a proper strategy of information literacy for research purpose, all the measures listed above will be adopted to measures information literacy skills of this study. With the above discussion, this study tends on investigate the influence of ICT skills and information literacy skills on electronic library patronage by students in selected polytechnic in Osun State, Nigeria to fill this gap identified.

## **1.2 Statement of the Problem**

Electronic library patronage is the key for students in tertiary institutions especially polytechnics to access needed information that would result to academic success.

Librarians are involved in provision of necessary academic information, providing suggestions for library users about new information to try, help library users check out books. When there is provision of ICT facilities in the polytechnic libraries, it becomes easy for students to make use of these facilities to better their knowledge acquisition through e-library. However, preliminary investigation, close observation and literature

review has revealed a decline in ICT facilities and this has resulted to poor information access for the students. As a result, electronic Library Patronage of Basic information has been limited for library users (students), as we know that the purpose of using library is for acquisition of knowledge and for research, this may result to non-availability of information and data for research purpose and academic success and it will eventually lead to poor development on the nation's economy and infrastructural development<sup>10</sup>

Library users (students) were perceived not to have access to necessary information due to poor ICT skills and mostly due to the fact that the libraries are not up to standard and some are also lacking ICT facilities. Several studies have been conducted on ICT skills, information literacy skills, and electronic library patronage of students but few has been done on the influence of ICT skills and information literacy skills on electronic library patronage by students in selected polytechnics in Osun State, Nigeria. Hence, this study tends to investigate the influence of ICT skills and information literacy skills on electronic library patronage by students in selected polytechnic in Osun State, Nigeria.

### **1.3 Aim and Objectives of the Study**

The aim of the study is to investigate the influence of ICT skills and information literacy skills on electronic library patronage by students in selected polytechnics in Osun State, Nigeria. The objectives that guided the study are;

- i. Identify the level of electronic library patronage by students in public polytechnics in Osun State, Nigeria.
- ii. Identify the level of ICT skills among students in public polytechnics in Osun State, Nigeria.
- iii. examine different information literacy skills among students in public polytechnics in Osun State, Nigeria.

- iv. investigate the influence of ICT skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria.
- v. determine the influence of information literacy skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria.
- vi. examine the combined influence of ICT skills and information literacy skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria.

#### **1.4 Research Questions**

1. What is the level of electronic library patronage by students in public polytechnics in Osun State, Nigeria?
2. What is level of ICT skills among students in public polytechnics in Osun State, Nigeria?
3. What are the different information literacy skills among students in public polytechnics in Osun State, Nigeria?

#### **1.5 Hypotheses**

The following hypotheses have been developed and will be evaluated at a significance level of 0.05.

**H<sub>01</sub>:** There is no significant influence of ICT skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria.

**H<sub>02</sub>:** There is no significant influence of information literacy skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria.

**H<sub>03</sub>:** There is no combined influence of ICT skills and information literacy skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria

### **1.6 Significance of the Study**

Tertiary institution libraries, Researchers, Library Policy makers, Administrators, the Government and Practice Society Theory Policies will significantly benefit from this research. The findings of this study will assist tertiary institutions on how to equip their libraries with ICT and electronic facilities in order to enhance students' access to academic information. This will establish a link and basis for future researchers and governments working on relevant research topics, it will also serve as a plan for government and management of polytechnics on how to help students and staff in location, selecting, organizing, presenting and acquiring the needed academic information at the right time. This study is based on current events that are still unfolding, it is expected that the research work will deliver pertinent and current data to scholars and students that would embark on researches about different phases of electronic library patronage and raise further questions for future researchers.

### **1.7 Scope of the Study**

The study will focus on the influence of ICT skills and information literacy skills on electronic library patronage by students in public polytechnics in Osun State. The measures of electronic library patronage are frequency of use of library and purpose of using library. The measures of ICT skills are ICT usage, computer availability, use of internet technology and use of Microsoft Words and other packages and the measures of information literacy skills are defining the kind of information needed, locating the right information, selection of appropriate information, organizing the information, presentation of information and accessing the information. The geographical scope will cover three

Public polytechnics in Osun State which comprises Osun State Polytechnic, Iree, Federal Polytechnic, Ede and Osun State College of Technology, Esa-Oke. The respondents will comprise of all students from various departments in the Polytechnics.

### **1.8 Limitation of the Study**

This study intended to cover both private and public polytechnics in Osun State. However, due to financial constraint and limited time for the research, the researcher could only cover public polytechnics.

### **1.9 Operational Definition of Terms**

***Electronic Library Patronage:*** This is the act by which students of selected polytechnics in Osun State make use of the school e-library to access academic information when needed.

***Frequency of Use of Library:*** It is how often students of the selected polytechnics in Osun State make use of the school e-libraries to access academic information.

***Purpose of Use of Library:*** It is reason students of the selected polytechnics in Osun State make use of the school e-library.

***Information Resources Use:*** information resource use is meant for various reasons such as assignment, class work, general studies, personal development and relaxation.

***Types of Services:*** this include the supply of video, music, games, lotteries and other games of chance, downloads of films to PC, website services, software services and supply of distance teaching.

***Clientele Retention:*** This is a metric that measures customer loyalty, or the ability for an organization to keep its customers over time

**ICT Skills:** This is the process whereby students of selected polytechnics in Osun State acquire necessary Information and Communication Technology skills in order to access academic information through the school e-library.

**ICT Usage:** It is the process whereby students of selected polytechnics in Osun State use Information and Communication Technology facilities to access information in the school library.

**Computer Availability:** This is the rate at which the management of the selected polytechnics in Osun State make available and accessible computer facilities to students.

**Use of Internet Technology:** This is the process whereby students of selected polytechnics in Osun State make use of the school provided internet facilities to acquire information needed at the right time.

**Use of Microsoft Word and other Packages:** This is the process whereby students of selected polytechnics in Osun State use available Microsoft packages including MS word for the purpose of learning and research in the school library.

**Information Literacy Skills:** This is process of exposing the students of selected polytechnics in Osun State to the acquisition of skills needed for seeking information in the school library.

**Identify the kind of Information Needed:** This is the process whereby students of selected polytechnics in Osun State specify the kind of information they are searching for at a particular time.

**Locate the Right Information:** This is the process whereby students of selected polytechnics in Osun State locate the information being targeted at a particular time.

**Select appropriate Information:** This is the process whereby students of selected polytechnics in Osun State settle for the needed information at a particular time.

**Organize the Information:** This is the process whereby students of selected polytechnics in Osun State organize acquired information.

**Present the Information:** This is the process whereby students of selected polytechnics in Osun State present the information acquired in the library when needed.

**Accessing the Information:** This is the process whereby students of selected polytechnics in Osun State access information needed at a particular time.

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## **Chapter Two**

### **Literature Review**

#### **2.1 Introduction**

This chapter will review the literature relevant to this study. The theories relevant to the study area will also be reviewed. The chapter will dwell on the concept and empirical studies that discuss the link between Information and Communication Technology, Information Literacy and Electronic Library Patronage by students in selected Polytechnics in Osun State, Nigeria. This chapter is organized as follows;

#### **2.1 Conceptual Review**

2.1.1 Overview of Electronic Library Patronage

2.1.2 Concept of ICT Skills

2.1.3 Information Literacy Skills

#### **2.2 Theoretical Review and Framework**

2.2.1 Technology Acceptance Model

2.2.2 Diffusion of Innovation Theory (DOI)

2.2.3 ACRL Framework on Information Literacy

#### **2.3 Review of Empirical Studies**

2.3.1 ICT Skills and Electronic Library Patronage

2.3.2 Information Literacy Skills and Electronic Library Patronage

2.2.3 ICT Skills and Information Literacy Skills on Electronic Library Patronage

#### **2.4 Conceptual Framework**

#### **2.5 Summary of Literature Reviewed**

## **2.2 Conceptual Review**

### **2.2.1 Overview of Electronic Library Patronage**

Academic libraries exist to provide specialized information services and resources to members of the academic community where it is situated. It is indeed the primary source of information to students, faculty, staff and the entire academic community due to the fact that its resources and services satisfied the academic and curricular needs of members of the institution. It acts as vehicle for disseminating information and the related computer technologies through the best practices for utilization by its community of users and also for the exchange of information among its users<sup>1</sup>.

A library is a curated collection of sources of information and similar resources, selected by professionals and made accessible to a defined community for reference or borrowing, often in a quiet environment conducive to study. It is a special room, a building or a place of storage specifically meant for housing some selected sources of information either touchable (non-electronic) or untouchable (electronic) such as books, disk, and some non-print materials that are good to generate further useful information and is gathered by professionals. Students mostly turn to the library to put vital information together in order to help them in their studies. It has been made clear that no system of education is complete without well-equipped libraries, with services operationalized either directly through contact with students and lecturers or indirectly through activities carried out behind the scene. Libraries, especially those attached to universities or any educational institution are to serve as an auxiliary to a parent institution in carrying out their objectives. It is also an important intellectual resource of the university community and helps them to fulfill the curriculum.

Library is a vital facility for enhancing learning, teaching and research<sup>2</sup>. It is the hub of all academic activities established to prove intellectual excellence. A library can only be

regarded as the hub of all academic activities where there are adequate library resources that are well utilized. The worth and impact of a library can be felt through the utilization of the various resources acquired by the library. Effective utilization of “the library information resources will no doubt add value to the functions of the library in any society.

The quality of information sources in libraries has an influence on the patronage of the library by lecturers of the university community. There would always be a correlation between quality of intellectual materials available and the quality of research and scholarship; that no educational system would ever be greater than the quality of its lecturers; and that teachers that are starved of current information sources would be ill-prepared to produce quality graduates. However, libraries cannot play their roles if students do not make use of them. The need to identify current trends in library patronage is what has prompted the students. The library is regarded as an information centre charged with the responsibility of selecting, acquiring and organizing various information resources to meet the needs of its users. Library renders “essential services in tertiary institutions of learning. It supports the academic programmes of the parent body by providing relevant information resources that is capable of ensuring success when utilized. Meaningful academic success can only be achieved when there is a functional library with adequate information resources that are well utilized.

The value of a library collection lies in its effective utilization by the user community<sup>3</sup>.

The major aim of any University library is to support teaching, learning and research activities of its parent institution. They emphasized that University must therefore, make sure that their resources are well utilized as this is essential for educational development of students. University libraries are at the centres of transforming it user’s academic performance. Libraries must serve groups of users with diverse information resources,

research techniques and at the same time attract users from patronizing the library. In addition to the challenges facing most libraries such as internet and modern infrastructure, libraries must also confront a rapidly changing educational and e-publishing environment, in which the value and cost of a University education is being questioned. A higher demand for current information resources and per year acquisition of resources to encourage users from patronizing libraries which means libraries must prove their value and the value of the University system. Several institutions have attempted to assess the impact of academic libraries on student success but have often struggled with patron privacy concerns.<sup>42</sup> The university library last year commenced the statistics analysis of library user's patronage in ascertaining the success of their user's performance during and after semester session. The study found that there are statistically relevant data showing undergraduate (students) uses library much frequently than other three (3) categories of users, which are staff, researchers and community users<sup>4</sup>.

Association of Research Libraries recommended that there is a connection with increase in admitting students into higher institutions and the level of library patronage<sup>5</sup>. Libraries will have a significant impact on future user expectations. Researchers in the field of education are writing about how factors such as technology have a significant impact on how libraries changes user's performance. In a study done with 27 colleges and universities participating, it's revealed that a majority of students, specifically 73%, use the library much more than other groups of users. Library has the mission to build and maintain a collection that will support and enhance the instructional needs of the institution<sup>6</sup>. The study also suggested that "academic library is to provide access to all sources of information and to attract users from patronizing the library. The services of the library depend on processed data from users to understand their information need and make corrections on past mistakes and improve on the future. This can be achieved by

library users; they determine the effectiveness and efficiency of the services provided by the academic library.

Library patronage depends on the resources, conduciveness and services rendered to library users<sup>7</sup>. The user is very critical to the services of a library, hence the user of a library must be constantly asked to assess the services and resources provided, as this will help the library to improve upon its services. First year students (freshmen) are the least likely library users while those in 200 and 300 level of studies are most likely to use the library. This stems from the belief that students in their initial years of university studies may not be required to write detailed term papers compared to their peers taking upper level courses<sup>7</sup>. In contrast, freshmen are more likely to use the library than seniors. This is primarily because incoming students are more amenable to library instructions and propaganda, and would thus be more receptive to library visits<sup>8</sup>. Hence, the effect of student's academic year on library utilization appears to be mixed. This is because "perspective student-users are often from diverse backgrounds and possess varying skill levels and knowledge of the library functions. Thus, when students become more comfortable with the services offered at a library, this would likely lead to a higher willingness of eventual use. Off-campus students actually use the library more often than their on-campus cohorts as it serves as a rendezvous point during time between classes or a quiet place to study away from home<sup>8</sup>.

The educational background of a student's parents may play a statistically significant role in the likelihood of library visits by the student". This stems from the fact that better educated parents realize the values of the library and may have inculcated this notion in their children in the past. This includes "taking their children to the libraries during their formative years, thus, leading to these values being carried over into the university setting<sup>8</sup>.

The library environment encompasses all the circumstances, people, things, and events around the library and can have potential effects, positive or negative, on the library usage. The design of a library can influence users' behavior and satisfaction in the same way that the physical environment and organization of a library can. Attitudes of library staff also count as they will make users comfortable or uncomfortable in using library services.

Libraries are to create a learning environment in which faculty and students are provided with a variety of library resources and ultimately, become competent users<sup>9</sup>. However, the assessment of the use of resources in each academic institution is very complicated. Administrators as well as the library need to know whether faculty and students do make use of the resources of the library and whether the use of these resources genuinely helps students with their assignments and faculty with their teaching and research responsibilities. Librarians need to find a way to attract students. To do so, they have to be friendly, unassuming, proactive and knowledgeable in order for the relationship to thrive. Library is an outfit providing numerous services to users, addressing their diverse needs, characteristics and interest". In other words, a library could said to be a place, where intellectual materials both those in print and non-print formats are acquire, process and made available to whom will be user under a conducive atmosphere<sup>10</sup>.

There is limited research on the assessment of financial needs in mobile finance research. Indications are that research on the context in which ICTs are applied, and adoption of ICTs are extensively studied and conceptualized, while research on financial needs, design, and development of ICT applications and contribution of ICT for development are comparatively neglected in the reviewed studies. Three reviewers focused on reviewing the contribution of mobile phones for development. Two reviews found a high use of mobile phones as the means used by communities to build their capabilities. For instance,

a scholar found a high prevalence of mobile phones as the main tools used by SMEs as compared with computers. Consistently, it was found that more than half of the reviewed papers studied mobile phones, followed by telecenter, general ICTs, and desktop computers. Other types of ICTs assessed by the systematic reviews range from general ICTs, to specific ICTs, such as the desktop computers; telecenters; rural radio; and several types of IS, for example, free text user interface, Geographical Information System (GIS), health IS, e-government, and e-commerce<sup>72</sup>.

We found mixed results regarding the contribution of ICT to development in the surveyed systematic reviews. On one hand, two reviews reported that ICTs are a key contributor to development. For instance, a scholar concluded that ICTs contributed to sustainable livelihood of communities in various aspects, including human, social, financial, physical, and natural assets. Another review found that the principal achieved functioning was access to information and communication services, which can play a key role in developing social and human capital in remote communities. On the other hand, six reviewers reported that ICTs were a key contributor to some dimensions of development during the time of their reviews. ICTs could be used as a tool for SMEs to drive socioeconomic development in areas such as information sharing, enhancement of business operations, and improved use of assets and structures, resulting in poverty reduction.

However, it was noted that the positive association between ICT and poverty reduction is still questioned from the reviewed theoretical and empirical studies<sup>73</sup>. Another review from South Africa reported that ICT played a key role to some development dimensions (such as agricultural supply chains, the provision of health care for the poor, and development of policies for improving lives of the poor). However, ICTs did not benefit

the poor on other aspects, such as e-government direct services and telecenters. Mobile phones increased information flow in the value chain, which translated into reduced price variability and higher profits per actor. However, few studies reported evidence on the contribution of mobile phones in the creation of new business or ability of producers to bypass middlemen. Further, a scholar also found that most benefits derived from the usage of mobile phones seem to be generated from market diffusion (adoption and use). There was less evidence on the extent and distribution of benefits regarding the use of mobile phones for the agricultural and rural development.

Consistently, research on needs and impact of mobile finance is scarce, while research on application design and adoption has been well conceptualized. Similarly, it was found that most researches tend to center around understanding the context in which ICT operates including best practices and experiences, while research on linking ICT initiative with development and design and development of applications for illiterate people is understudied. It is argued that research studies need to address the whole lifecycle of ICT applications development, ranging from user requirements to design, implementation, and evaluation of ICT initiatives, instead of addressing usability issues by end users<sup>74</sup>. What emerges from the reviews outlined above is that the positive linkage between ICTs and development remains contested in the surveyed reviews as already observed in the literature. While some scholars argue that ICTs have provided tangible benefits to the poor, others argue that the poor cannot benefit from ICTs for a number of reasons.

First, the ICT projects have not attained the required scale, they are either localized or at a pilot stage. Second, they tend to be a practitioner and not academic oriented, and thus, their results are disseminated through publications and not to inform policy. Third, most of these projects are funded by donors or the public, and therefore, their results of impact

assessment, monitoring, and evaluation are not made public. Fourth, each of the ICT projects has a different view of development that affect their project development, implementation, use, and outcomes. Fifth, there is an overemphasis on the supply side of ICTs when evaluating the role of ICT for development. This means that most of the assessed ICT reviews focused on analyzing the supply side (eg, benefits of investment in ICT infrastructure), without comparing with the outcomes of the investment for development issues such as education, health, roads, etc<sup>75</sup>.

Broadly speaking, as a revolutionary intermediary force with infinite potential and compatibility, internet can be seamlessly fused and deeply integrated with any traditional object, thus completing the revolutionary transformation of traditional industries. In China, people define a concept called Internet plus (Internet plus) to describe this phenomenon. This includes two aspects<sup>76</sup>. First, the Internet plus will emphasize six core concepts such as cross-border integration, innovation driven, reshaping structure, respect for human nature, open ecology and connecting everything. Second, internet information technologies provide the traditional industry with the ability of communication and computing at anytime, anywhere and on demand, making them more conveniently to use data resource than before, and giving full play to the value of Big Data. These can eventually generate a new economic form with many characteristics such as product-based, user-oriented, closed-loop of online and offline.

According to this trend, we can boldly imagine that libraries in the future should be more modular and functional, and gradually evolve into various functional units providing independent services. Users can actively access relevant service according to their own interests and needs. From this point of view, library can be regarded as an interconnected structure adapting to the changing environment and user requirement, which can realize

the interconnection of user, institution and data, so as to obtain the more recognition of user and realize its own value. We do need “libraries that are different from traditional libraries and moving toward new form with realizing new functions. (3) Personalized user service: “the rapid development of internet technology makes it possible for libraries to make full use of users’ personalized characteristics. Each user has a different view of the library. Through Big Data analysis, libraries can formulate corresponding service content and allocation resource for different user groups to ensure that the cost of user service is proportional to the value of library. (4) Diversity of access: as the most important characteristics of Web 4.0, ubiquity refers to the ubiquitous connection at any time and any space, identity refers to the personalized service provided by identifying user’s context information and connection refers to the consistent and extensive collaboration between users. At this time, a large number of connections can be formed between user and space, user and resource, user and librarian, librarian and librarian and user and user, thus more opportunities and possibilities for library service innovation can be achieved. The restriction of space layout in the library can be broken through, and the ubiquity and virtualization of the library service place can be implemented.

The idea of Internet plus in library can prompt the deep integration of internet with traditional libraries, and can be helpful in building the intelligent library. The following innovation of library service can be realized: Innovative book purchasing: the traditional book purchasing modes of libraries mainly include bibliographic-based mode, MARC-based mode and live mode. With the support of internet, digital library can innovate existing purchasing modes and achieve real-time communication of information between libraries, library distributors and publishing organizations, so as to implement unimpeded online interaction between the three upstream and downstream parties”. User of library can become supplier’s customer and play the role of interviewer to buy his favorite books.

Changsha Library in China began to cooperate with bookstores in 2010 and held several events to purchase the books chosen by users<sup>78</sup>.

Library can fulfill its function best by pursuing a policy of constant self-evaluation in order to be alert to changing needs of its users. If the library is to contribute to the advancement of knowledge, it must provide adequate resources and also ensure its effective use by the clientele<sup>11</sup>. However, library services is increasingly becoming more challenging as a result of information explosion that is now available in diverse mode”. With this development, “libraries now try hard to out-wit one another by way of improving upon their services provision. This is because, it is only when they are able to render valuable or tangible services to users, that they can retain continuous patronage of such users. To retain users patronage therefore, libraries now embarked upon what society of Competitive Intelligence Professionals termed legal and ethical methods for collecting, developing, analyzing and disseminating actionable information pertaining to competitors<sup>12</sup>.

Electronic resources have revolutionized access to up-to-date outputs. The emergence of digital library resources in the past two decades has seen a rapid increase in the types and size and collections offered to users by libraries especially at academic and research institutions<sup>13</sup>. This development has had significant impact on how academic and researchers access up-to-date scholarly publication of their own research. Electronic information resources have acquired a major portion of library collections and are very useful in academic libraries. Electronic resources are resources which are in an electronic or digital form<sup>14</sup>. Electronic resources are materials in digital format accessible electronically. Examples of electronic resources are electronic journals, electronic books and online databases in varied digital formats. Furthermore, use of electronic resources permits the library to save space and time of the users. The value and use of “information

resources, particularly electronic resources, have increased with time. Therefore, there is a necessity to make studies on the different aspects of these resources and the issues relating to the use of electronic resources by users<sup>15</sup>. Tertiary institutions libraries have undergone major changes in terms of information collection, dissemination, conveyance, use of information and communication technology development in recent years. They also asserted that, in universities, electronic resources play an integral part in libraries by assisting in learning, teaching and research activities.<sup>18</sup>

Electronic resources (e-resources) are multi-platform, synchronous/asynchronous information supply instruments that are accessible through information and communication technology (ICT) contrivances by multiple users at different locations. Electronic resources are invaluable research tools, a subset of academic libraries and a significant academic resource used in learning, teaching, and research activities and complementing print-based resources by providing access to information to distant<sup>16</sup>. The libraries' role metamorphosed from "information storehouses to information institutions, then to centers of knowledge and culminating in becoming guides/facilitators to information access. This evolution of academic libraries/information centers through ICT has transformed library services procedures and structures, making electronic resources easily accessible and available<sup>16</sup>. Library print resources stock has drastically reduced due to increase in ICT devices, electronic databases, and modern book technologies. These developments include digitalization/multimedia technology, creation of metadata standards/copyright laws, institutional repositories, e-publishing/e-journals, static/dynamic web page creation/management. Challenges "associated with the management of electronic resources include monitoring changing access circumstances, license terms considerations and conditions attached to subscription, renewal, and authentication processes, resource sharing limitations, usage and data collection.

Library is a professional institution helps in supporting its patrons to gain access quickly and efficiently to any type of information from its rich and robust diversified collections of resources<sup>17</sup>. The elements that ensure electronic resources usage, such as, technology, cost, management, training, content, and information are building blocks to effective and efficient policy formulation. Infrastructure investments, electronic resources acquisition procedures, copyright and licensing issues, user's request for an electronic resource, strategic training for library users and librarians are ways of ensuring efficient access and use of academic library electronic resources. Library management should establish strategic planning team to formulate policies that will knit the library and patrons closely together. When proper policies on acquisition, access, electronic resources promotion, decision making, fundraising and communication are efficiently and effectively implemented, it will negate the numerous challenges of poor access to and usage of library service, recurrent demoralization of library personnel and the marginalization of the library.

Creating change to "library policy and practice based on electronic resource usage statistics will be integral to the success of libraries in the future; one way that libraries can utilize electronic resource statistics is to compare the curricula and degrees offered against electronic resource usage, that is: 1. A resource "may not exhibit medium or high usage but could be extremely valuable to a niche educational component in the university. 2. Alternatively, it could mean that the electronic resource does not meet the needs of patrons. 3. It could also indicate that "library outreach and education are needed to promote use and awareness<sup>18</sup>.

A Library located in the university or any tertiary institution is an academic library. Its mission is to help the parent organisation which is the host tertiary institution to achieve its

primary goal. Academic libraries help the university in teaching, learning and research development. The main function of an academic library is to help the tertiary institution in which it is located to achieve its educational goal. They stressed that academic libraries thus provide the relevant and current information to the user community in either print or electronic format. As the most “important infrastructure in the university academic libraries are made up of several units, departments or sections. Each unit or section is headed by a professional librarian. The various departments that “made up an academic library include; cataloguing, acquisition, circulation, reference, special collections, Africana, serials, bindery, reprography, and e-library departments<sup>28</sup>.

E- library is usually the biggest and peradventure the most distinguished department in an academic library, owing to its features. Most often, e-libraries occupy a separate building attached to the academic library building complex, sometimes it is just a large hall in the library complex. Currently, most academic libraries are hybrid libraries. Hybrid libraries are “combination of traditional library and electronic library. Hybrid Library/ Gateway Library/Complex Library is a continuum of traditional library, with electronic and paper-based sources used alongside one another.

A library with computerized information storage and retrieval systems connected to computers and most times the internet is called electronic library. The term electronic library is often shortened as e-library. As a matter of nomenclature, e-library can be referred to as digital library, virtual library, community network, library without walls or library of the future. E-library is a library with little or no physical presence of books, periodicals, reading space or support staff, but one that disseminates information directly to the distributed users, usually electronically. In e-libraries, the services are fully automated where all resources are in digital form. E-library is a tool that documents,

preserves and disseminates historical, cultural and intellectual heritage of a nation. It is a means of enhancing information provision and learning. E-libraries are organized set of links to items such as documents, software, images, databases, on a network. Electronic library is the library where some or all of the holdings of the library are available in electronic format, and the services of the library are also made available electronically-frequently over the Internet so that users can access them remotely<sup>29</sup>.

E- library has to do with multimedia materials in digital form, designed for the benefit of its user population, structured to facilitate access to its contents, and equipped with aids to navigate the global network, with users and holdings totally distributed<sup>30</sup>. An e-library is a virtual organization that comprehensively collects, manages and preserves rich digital content and offers to its user communities specialized functionality of the content of measurable quality and in accordance with codified policies. It is called 'virtual' because, in a good electronic wide, area networked library, the user enjoys the euphoria of being in distant libraries and yet has not physically moved". A virtual library is an organized set of links to items (documents, software, images, databases, etc.) on a network<sup>30</sup>.

E-library is a technology that brings together the resources of various libraries and information services, both internal and external, in one place, so that users can find what they need quickly and easily. Whatever digital libraries may be called, they are collaborative ventures in which information professionals and other experts in specified subject areas pool their knowledge and experience to collate information on a specific subject. Association of College Research Libraries (ACRL), summarised e-libraries in five sentences as follows; The digital library is not a single entity The digital library requires technology to link the resources Linkages between digital libraries and information services are transparent to users Universal access to digital libraries must be a goal Digital

library collections are not restricted to document surrogates but include digital artefacts that have no printed equivalent. Having looked at the definitions above, the researchers then define e-libraries as organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that, they are readily and economically available for use by the clientele. Information resources obtained through the e-library is known as e-library resources or electronic resources<sup>31</sup>.

Examples of electronic resources are; web sites, online databases, e-journals, e-books, electronic integrating resources, and physical carriers in all formats, whether free or fee-based, required to support research in the subject covered, and may be audio, visual, and/or text files. Also, electronic information resources include World Wide Web; WIFI; search engines; online indexes; video CDs VSAT based Internet connectivity; online Library catalogue; online databases; portals; E-journals and E-books. They further enlisted specific types of electronic information resources as consisting of electronic books (e-books), electronic journals (e-journal), and indexes, collections of journal articles, reference works, digital collections and databases”. Information contained in electronic information resources can be accessed only through the computer and internet<sup>31</sup>.

The objective of university e-library is limited if access and retrieval of e-resources and services are ineffective. However, access to and retrieval of digital information resources has remained one area of growing concern for e-librarians. The Library of Congress Collections Policy Statements Supplementary Guidelines stressed that electronic resource is any work encoded and made available for access through the use of a computer. It includes “electronic data available by remote access referring to the use of electronic

resources via computer networks; and direct access (fixed media) referring to the use of electronic resources via carriers (e.g. discs/disks, cassettes, cartridges) designed to be inserted into a computerized device or its auxiliary equipment<sup>32</sup>. For a library user to access e-library resources, he must be computer literate. E-resources are most useful to the information literate users of any library. Improved access to e-library resources enhances research activities, promotes efficient delivery of information economically to all users; encourages cooperative efforts in research resources, computing, and communication networks; strengthens communication and collaboration between and among academic researchers and take leadership role in the generation and dissemination of knowledge.

E-libraries offer such benefits as equitable access to information, reduced barriers of distance, timeliness, shared resources and content delivery. The mission of e-library is to provide both information services and resources that are capable of meeting the research, teaching and learning needs of the faculty and students. Of course, academic researchers see e-library as research Centre and intellectual energy house where knowledge, ideas and directions are generated to achieve research goals of the university”. E-libraries are “designed to enhance the accessibility of information where users can browse information electronically in a digital environment via local area network (LAN), campus back bone (Intranet) or Internet. E-libraries use advanced information technologies, such as information retrieval, multimedia communication and information visualization. Digital libraries bridge the lack of integration that exists between library systems and other kinds of information resources such as document databases (text or multimedia) and structured databases. Their advantages include: access to information that might be restricted to the user due to geographical location or finances, access to more current information, and provision of extensive links to additional resources related contents<sup>32</sup>.

E-libraries have been the prerogative of the developed world, and due to the advancements and affordability in computer and communication technology, they are, though slowly, getting importance in other countries. The transition from “print to electronic medium, apart from resulting in a growth of electronic information, has provided users with new tools and applications for information seeking and retrieval. Electronic resources are invaluable research tools that complement the print-based resources in a traditional library setting. This rapid emergence and development of electronic information technologies therefore makes it possible to envision radically different ways of organizing the collections and services the library has traditionally provided. There are areas in which improvement and innovation are needed to facilitate access to and retrieval of e-resources. They suggested creation and adoption of metadata standards to signal how ‘open’ content is; improved identification of free articles in hybrid journals; permanence of access and reliable archiving for free content; comprehensive indexing of quality free resources by discovery systems; provision of usage statistics for free online content, consistent across publishers; improved integration of free content with link resolvers; development of a wider range of trusted repositories linking to free content; improved user interfaces for accessing library-surfaced content; more training and support in information literacy skills for students and faculty; development of metrics for evaluating impact of content on institutional performance<sup>33</sup>. Library collections of print resources or formats are in sharp decline and the use of electronic journals (e-journals), electronic books (e-books) and databases are apparently in vogue to aid the academic work of students and researchers.<sup>12</sup> Availability and “timely access to these wealth of e-resources are pertinent to patrons as they constantly rely on research work for scholarship”. E-resources usually consist of e-books, e-journals, and other electronic materials such as articles, theses, dissertations, databases and CD-ROMs, which are likely to be the alternative to the print media<sup>20</sup>. The

success of “academic libraries depends on the ability of users to get fast track information sources to better serve the needs of the academic community. Technological savvy users in this digital era are highly impatient and time conscious when searching for information—they want information Just now or Never.

Libraries in third world countries have challenges subscribing to e-resources due to financial constraints. In Ghana as in other countries in sub-Saharan Africa, university libraries are still making substantial effort to provide access to useful electronic information resources to support teaching, research and learning in the face of financial constraints associated with the provision of both print and electronic resources to its users. Owing to the great importance and usefulness of electronic resources, the Consortium of Academic and Research libraries Ghana (CARLIGH) pays on average of \$ 250,000 as subscription fees to enable students, faculty and researchers affiliated to the Consortium have unlimited access to selected scholarly electronic resources but surprisingly this expensive venture is underutilized by users. Some studies in “Ghana and Nigeria have explored the availability, use and access of electronic resources by students, however; there is a gap between availability and accessibility of e-resources for which reason there is the need to examine in closer detail how and why the patronage is low<sup>21</sup>. This could be due to an “interplay of several unique factors both compositional (user demographic attributes, skillset, prior experiences, generational) and contextual (institution-specific factors such as the college of affiliation, the library environment). Previous studies have almost exclusively focused on independent challenges with little attention to concurrent or simultaneous multiple challenges.

Electronic information resources help in facilitating access to information we need in an easy and speedy manner and this has become the backbone of many academic institutions

of higher learning. Electronic resources have proved to be invaluable to many academic institutions around the globe due to the changing needs of patrons and information communication and technology tools. Library users are aware that libraries comprise electronic resources that are more comprehensive, scholarly and relevant to their needs than most websites provide. In the light of literature, many studies have delved into this theme of usage of electronic resources by both graduates and undergraduates. A reviewed published literature on the importance of the usage of electronic resources in academic libraries, and found that students were the biggest users of online resources in terms of sessions undertaken and pages viewed<sup>22</sup>. They recommended that “the usage of e-resources should be regularly examined and users’ attitude, behaviour and their modes of searching could be properly reviewed so that the library can effectively serve it to users around the world.

A scholar used secondary survey data to research into the main causes of low patronage of electronic resources among students, and observed that lack of enough internet skills and awareness; poor infrastructure and connectivity as well as non-use of single sign in on systems were dominant challenges<sup>23</sup>. Most students use the e-resources for assignments and research projects however access to relevant e-resources vary especially across the various disciplines in Nigeria”. Erratic power supply coupled with erratic internet connectivity and lack of skills for exploiting resources by undergraduate students are some of the major challenges faced by students in public universities in Ghana. A scholar examined the association between gender and the use of electronic information resources in the area of training, access, awareness and availability and year of study, and concluded that males were more likely to use electronic information resources than female students in a public university in Tanzania<sup>24</sup>.

A researcher investigated the challenges users face when accessing electronic resources in the library and identified unreliable power supply and snail speed of internet connectivity as a major challenge. This is similar to “what another scholar found in the context of Library and Information Science postgraduate students in Nigeria where access to electronic resources was characterized by poor connectivity coupled with epileptic power supply, high cost of access, and download delays. In a study on availability, accessibility and use of electronic information in Nigeria exposed power outages, slow and poor internet connectivity, lack of relevant resources as challenges obstructing students from use<sup>25</sup>. A researcher explored access and use of electronic resources in Ashesi University College, Ghana, and found that the overall computer usage for information access was high because the University had the infrastructure in place but the use of some databases was low due to inadequate information or awareness about the existence of these, library resources and lack of personal computers in the library<sup>26</sup>. Sundry factors have been attributed to low patronage including lack of awareness of such a facility, poor ICT infrastructure and lack of knowledge on how to use e-journals; low internet bandwidth coupled with high cost of internet and frequent power cuts and slow downloading and blockage of websites.

Despite e-resources having facilitated the availability of increased resources to the library at reasonable costs and time, the expectations of patrons have increased as well. Who questions the significance of the massive investment into designing a library website if patrons do not value such investment as indicated by low usage<sup>42</sup>.

Obtaining feedback from library patrons is critical to improving library services. This means that library patrons should continuously provide feedback to librarians to improve their services”. However, even though a library may be well-equipped, it will amount to a waste of resources if it is not well visited or patronized. Libraries need to determine usage

statistics through surveys among patrons to help when making acquisition decisions rather than impulse buying, which assumes knowledge of patrons' preferences. Having a good understanding of patrons' preferences is a critical approach to meet and improve patrons' expectations. For academic libraries to meet the expectations and preferences of patrons, librarians need to undertake quality improvement. The low level of "satisfaction among library patrons could be attributed to poor library service. As such, user satisfaction feedback such as the lack of expertise at the information counter, the lack of efficient reference services, the need for recent periodicals and journals, the lack of photocopying services, the need for a well-organized circulation service, and the lack of functional schedules have been identified as fundamental problems<sup>43</sup>.

Academic libraries need to satisfy their customer needs since their users are very demanding and dynamic<sup>46</sup>. The growing recognition for students to be able to locate their information needs through the internet and World Wide Web (www) regardless of location, academic libraries should endeavour to satisfy each unique need of their patrons. Moreover, measuring the impact and value that individual libraries have on patrons will enable academic libraries to meet patrons' satisfaction. Patrons' satisfaction is linked with the number of hours that the library opens and considered this as a library service that will get their acceptance and maximum satisfaction. Nonetheless, patrons may not be fully satisfied with the type of services they get from their academic libraries if there is a lack of a conducive academic environment<sup>48</sup>. The different findings from various studies indicate that there is no one indicator to determine how satisfied a patron can be.

The influence of technology in improving library service and students' expectation and preferences is critical. All members of academic and research staff and not all students are happy with computer-based access to resources because many are happy with existing systems and are quite resistant to change. This means that redesigning existing systems is

not about new technology but also about changing professional roles and changing the culture of the organisation. This is not an easy task. Moreover, some patrons are still unable to utilise library information resources because they do not have the necessary skills to access these sources<sup>48</sup>. Consequently, libraries need to have specific facilities in place to attract patrons to the physical library such as internet workstations, and copiers for scanning, while at the same time ensuring that patrons' privacy is well protected. Although, the availability of automation in libraries can help to attract patrons, librarians are still required to provide some personal touch to their services to attract and retain patrons. As more libraries embrace online services and improved e-resource availability, more patrons' preferences will be satisfied, and this will provide more attractions for prospective patrons.

In remaining relevant in the face of changing technologies, libraries need to find innovative technologies to reposition themselves without losing existing patrons". Libraries that "are adopting automation systems need to continually extend personalised services to those patrons who are new to such technology to increase the base of patrons using such technology. Notwithstanding, the difficulty in adapting to new technologies remains because some patrons are accustomed to retrieving information in a conventional way. Hence, it is essential for librarians to understand their patrons' level of adaptation through patrons' assessment and volume of use<sup>49</sup>.

In a conducted viewpoint and survey of international students of Marketing academic library resources and information services to international students from Asia. The author used personal experience, observations and survey to find out whether Asian international students had experiences of using academic libraries; and whether they are aware of the services and resources available for their study in a Western academic setting<sup>50</sup>.

Majority of the users frequently access the library and its resources on daily basis while majority of postgraduate students use the library on weekly basis for research<sup>51</sup>. Therefore, library should be aware of user needs and usage frequently because they will use the library one way or the other even if they are not highly satisfied with library services. Majority of this user “use the library for reading, learning and research. Also, majority of them access eBooks both from the library website and also more from Summon. In addition, almost all of them use journals from summon, google and google scholar. Moreover, these user groups use the library help center and student library helpers who shelve the books and answer IT enquiries whenever they need help. It means understanding and knowledge of what is trendy in the world outside the business to increase one's competitiveness. It means having knowledge of business happenings in the global environment, to increase one's competitiveness. It involves learning as much as conceivable about the outside situation of a business in general and pertinent players in the business. The term competitive intelligence is frequently regarded as tantamount to analysis of players in a business.

For polytechnic libraries structure, the materials in the library are supposed to be worked out in connection to the academic activities being executed in the polytechnics. The goal of polytechnic libraries is the provision of knowledge and evident to those who seek for such information and to assist academic demands in the polytechnic communities. Polytechnic professionals will gather, analyze and choose the list of titles for print materials to be purchased and disseminate to available users<sup>52</sup>.

Academic libraries are significant to higher education institutions to provide support to its curriculum and faculty and student research<sup>36</sup>. They are necessary because of the emerging knowledge management field to help improve effectiveness. However, a scholar observed the apparent dearth of academic libraries arising from the decline in the circulation of print

materials, reduction in the use of reference services, and a decrease in front desk counts. Additionally, academic libraries are under pressure to develop new resources and service areas to respond and adapt and so remain relevant in the face of rapid developments in technology. These rapid developments require changes in scholarly communication, data management, and higher education pedagogy and are in turn affecting user expectations. Hence, academic libraries need to live up to such expectations by rendering the necessary support to its patrons within the university community. Students' patronage of academic libraries is at a low ebb. Patronage is an essential consideration for library management because it is a critical reflection of the delivery efficiency and the effectiveness of the complete service. Feedback on library services must be obtained from time to time from users to improve service delivery<sup>37</sup>.

Some university students find it challenging to locate library materials, even though the subject discipline method enables students' easy access to more relevant materials, the limitation is their inability to access works of interest relating to their subject areas that appear within the literature of other disciplines. Reasons for students making use of library facilities have mostly been linked to preparation for a test, reading of newspapers and use of online facilities for social media purposes. Although library patronage is essential to the continued development of library services, being considerate of current patron preferences is equally significant to achieve optimal service. Scholars compare how a patron's interest in reading books correlates with a patron's use of library sources in the same way that motivational factors play a vital role in determining the level of library patronage among students. The degree of library patronage varies between institutions and between the disciplinary interests of students. For instance, students in visual science subjects may not patronise the library as much as those in humanities<sup>38</sup>.

Librarians' ability to assess the different communication tools employed and types of challenges encountered by patrons when accessing the electronic resource and to devise different ways to improve levels of patronage is crucial. The standard of patronage is a significant factor in deciding on a strategic approach to the management of a library. With a below-average level of patronage, a library will be unable to fulfill its role as a leading cultural, social, and learning institution in society. This means that libraries should continuously engage with their users to ensure that library resources, services and facilities continue to be valued and used. To this extent, both librarians and patrons need to continually share the responsibility of assessing and providing feedback about academic library services and collections to ensure sustained improvement. Nevertheless, the emerging generation of research and academic library users expect the delivery of user-centred information services through apomediation to support the role librarians can provide to users by bridging the gap when users need help. It is, therefore, good practice for librarians to study patrons' preferences on a regular annual basis<sup>39</sup>.

A library provides physical or digital access to material and may be a physical location with shelves of books or journals or a virtual space using electronic systems, or both. A library system which manages the library services is designed to help libraries with three main duties: increase operational efficiency, provide access to a library's collection and provide access to external resources<sup>40</sup>. There is a difference between the various electronic systems because of the nature of academically related services provided by the library. To increase library patronage, some libraries have essential features which make it attractive to patrons such as the location, architectural design, and electronic sources and shelving arrangements. A decrease in resource allocations to academic libraries may present a challenge in convincing patrons to see the value of using library services. Moreover, the rise of the internet over the last two decades has compounded the challenges because the

internet has provided more resources for users without them necessarily having to visit the library and so it has limited the number of users coming to the library because the library can, potentially, subscribe to many internet databases and make them available to users.

While patronising the physical, academic libraries may contribute positively to students' academic performance; one cannot be sure that library usage by university students can be linked to improved academic performance<sup>40</sup>. It is necessary to determine those features or characteristics that will motivate students to patronise the library more frequently and improve academic performance. Students who live off campus are more likely to use online or take out more library materials and information sources than their counterparts who live on campus. Hence, it implies that a student's proximity to the physical library is likely to be a significant factor of patronage. Another essential feature of the library is the availability of electronic sources. It is critical, therefore, to understand the reasons why some patrons make use of electronic sources. There is, however, a challenge when using library resources, particularly electronic resources, because their use is not necessarily straightforward. Despite electronic sources sometimes being a challenge, the use of a search engine over the internet has advantages.

The use of a single keyword can produce thousands of hits and enable library electronic source users to identify and select a database. One significant feature of modern library service is the use of mobile access technologies. Mobile access technologies have been embraced by higher education; hence, more academic libraries are recognizing patrons' demand for inclusion of mobile technologies to access library sources<sup>41</sup>. The potential of accessing library sources through social networks, namely, through mediums such as Facebook and Myspace. This results in a more relevant culture of social media usage in academic libraries which increase patronage. also, the availability of mobile access

technologies enables patrons to access library services in a unique way that does not require them to be physically present in a library building. As such, library features that do not require patrons to be physically present in a library building but allow access through electronic sources will improve patronage.

Notwithstanding that in most academic libraries, patrons can access quality material more quickly than they would previously have challenges remain which relate to user preferences. It appears that the availability of diverse electronic sources such as electronic sharing tools have altered the way patrons express demand for library services. As such, librarians find it difficult to cope with changing technology and patrons' preferences. However, high librarians will be able to cope with the increasing diversity of resources, such as different modes of online bibliographic instruction and different interfaces for public access to online catalogues. The range of services provided by contemporary library services should satisfy the diverse needs of users. Although expectations of social networks are that their use may change the way patrons access the library, the manner of promoting library services can also encourage library patronage. Academic library outreach is not uncommon but that such an outreach approach should further encourage increased patronage. Some outreach methods focus on encouraging library patronage among students and faculty so that these patrons do not source their information needs elsewhere. Despite e-resources having facilitated the availability of increased resources to the library at reasonable costs and time, the expectations of patrons have increased as well. Who questions the significance of the massive investment into designing a library website if patrons do not value such investment as indicated by low usage<sup>42</sup>.

Obtaining feedback from library patrons is critical to improving library services. This means that library patrons should continuously provide feedback to librarians to improve their services. However, even though a library may be well-equipped, it will amount to a

waste of resources if it is not well visited or patronised. Libraries need to determine usage statistics through surveys among patrons to help when making acquisition decisions rather than impulse buying, which assumes knowledge of patrons' preferences. Having a good understanding of patrons' preferences is a critical approach to meet and improve patrons' expectations. For academic libraries to meet the expectations and preferences of patrons, librarians need to undertake quality improvement. The low level of satisfaction among library patrons could be attributed to poor library service. As such, user satisfaction feedback such as “the lack of expertise at the information counter, the lack of efficient reference services, the need for recent periodicals and journals, the lack of photocopying services, the need for a well-organized circulation service, and the lack of functional schedules” have been identified as fundamental problems<sup>43</sup>.

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E-libraries have been the prerogative of the developed world, and due to the advancements and affordability in computer and communication technology, they are, though slowly, getting importance in other countries. The transition from print to electronic medium, apart from resulting in a growth of electronic information, has provided users with new

tools and applications for information seeking and retrieval. Electronic resources are invaluable research tools that complement the print-based resources in a traditional library setting. This rapid emergence and development of electronic information technologies therefore makes it possible to envision radically different ways of organizing the collections and services the library has traditionally provided. <sup>6</sup>

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### **2.2.2 Concept of ICT Skills**

ICT stands for Information and Communication Technologies and are define, for the purpose of this primer, as a diverse set technological tools and resources used to communicate, and to create, disseminate, store, and manage information”. The United Nations Development Program (UNDP) defines Information and Communication Technologies as basically information-handling tools-a varied set of goods, application and services that are used to produce, store, process, distribute and exchange information.

Quality education depends on the development of information technology in several provision such as enlarging the motivation of learner, enrichment of basic skills and increasing teacher training in technology. Information communication technology serving as curriculum/subject transformation tool, Information and Communication Technologies

(ICTs) is increasingly becoming indispensable part of the education system". It has changed many aspects of the lives. Those changes have leads to educational institutions, administrators, teachers to rethink their roles, teaching and vision for the future. ICT has witnessed newest challenges for quality education among learners<sup>53</sup>.

ICT in libraries is seen as a multiple set of technological tools and resources deployed to communicate, create, disseminate, store and manage information. A definition appears clearer and understandable to the non-professionals. It reads ICT is the application of computers and technologies for acquisition, organisation, storage, retrieval, as well as dissemination of information<sup>61</sup>. The argument here is that, a lay man (who is not familiar with technology) can easily associate computer with technology. That understanding "broadens the knowledge of interpreting the concept of ICT". Computer availability is significant to ICT. The advent of ICT has brought substantial transformation in accelerating the ALs information service delivery as evident in computing technology, communication technology, including mass storage technology. ICT adoption in academic libraries has necessitated the globalisation of library and information service delivery. Application of ICT in ALs paves the way to sharing and collaboration with other libraries to offer appropriate and timely services to users<sup>62</sup>. Globalisation with the aid of ICT enables academic libraries to create, organise, manipulate and access libraries from remote locations across the world within seconds. Similarly, globalisation of library services is a necessity and a welcome development as a single library cannot be all self - sufficient in term of acquiring information resources. Academic libraries "registered and paid for online databases like HINARI, AGORA, AORE, JSTOR, SCIRUS, SAGE, EBSCO, BLACKWELL and ELSEVERE to enjoy the benefits of ICT in order to serve their clients better and widely. ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems,

improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, is their sense of isolation, and ICTs can open access to knowledge in ways unimaginable not long ago. ICTs force that has changed many aspects of the way we live. If one was to compare such fields as medicine, tourism, travel business, business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced.

The proliferation of “Information and Communication Technologies (hereinafter ICTs) in last decades has either changed or tailored job responsibilities of most of the professionals including librarians and information officers. Library professionals are “expected to acquire and develop their ICT skills to cope with the new ICT advancements. Funding limits and customer demands are transforming the traditional level of staffing, service quality and access to resources in libraries. Libraries emphasize ICT skills when recruiting new staffs”. A scholar studied 200 job advertisements for the position of librarians in the UK, the USA, Australia and Canada. 38 skills and qualifications including a number of ICT skills were identified as required for the jobs. The listed ICT skills dealt with digital collections, databases, library automation systems, use of software applications (Operating System, Office etc.), design, creation and maintenance of web pages, programming, evaluation of software and hardware technologies, and various other aspects of ICT. ICT is critical to the countries intending to move forward to information or knowledge-based society”. If applied and used appropriately, ICT can act as a development enabler for individuals, organizations and countries<sup>56</sup>.

However, studies suggest that only having availability of and access to ICTs is not adequate; individuals must possess sufficient knowledge and skills to use ICTs effectively. There are “four types of resources required for practical use of ICT: (1) physical resources, (2) digital resources, (3) human resources, and (4) social resources. Physical resources refer to the physical infrastructure to access to computers and telecommunication connections. Digital resources include the digital contents accessible online<sup>56</sup>. Human resources encompass literacy and skills to use ICT, and social resources are the supports from the community, institutions, and societal structures to have access to ICT. Measuring the “Information Society Report 2017 of the International Telecommunication Union (ITU) indicates that there are significant level of digital gaps between developed and developing countries, and digital gender divide is significant in the developing countries. Although, both developed and developing countries are increasing their investments in ICT infrastructure substantially for socioeconomic development, all the countries are not benefited equally with their investments. The success of ICT access depends on ICT usage and ICT skills, and the intensity of ICT usage depends on necessary ICT skills.

Moreover, ICT learning is more important in the developing countries in maximizing the ICT usage and skills. Bangladesh, a South-Asian developing country with the literacy rate of about 73 percent in 2016 was ranked at 147 among 176 countries in the global ICT Development Index. Despite some government initiatives to foster access to and use of ICT in every aspect of daily lives, only 18% of the total population had access to the internet. In order to maximize the use of available physical and digital ICT resources, library and information professionals can play a dynamic role. Typically, “the graduates from the Library and Information Science schools work as library professionals in Bangladesh who can contribute to build a knowledge-based society. However, no empirical study was carried out to assess whether the LIS students, the future LIS

professionals, possess ICT skills required to perform as successful professionals. The present survey is the first-ever study attempted to measure the self-reported ICT skills and digital gender divide among LIS students in Bangladesh. The study was carried out in two LIS schools at the two largest and oldest public universities in Bangladesh". The findings of the study would portray the overview of perceived ICT skills of the LIS students in a developing country. It can help the LIS schools in Bangladesh and other developing countries to identify the loopholes in their curricula that should be modified to improve the ICT skills among their students. ICT skilled graduates from LIS schools could perform both as skilled library professionals and as human resources who can participate actively to build an ICT literate society<sup>57</sup>.

A similar impact has been observed in university libraries. Through the use of ICT in universities and research centres, it has become very easy to communicate quickly among people and organizations. The application of ICT has revolutionized the traditional concept of libraries from a storehouse for books to an intellectual information centre. ICT has made it possible to control the information explosion in such a way that it is now possible to collect information from any library in the world regardless of the topographical location of the user and the library. This has only become possible due to computer software, telecommunications apparatuses, and memory and input-output devices. The adoption of ICT in libraries has resulted in a remarkable improvement in their services. ICT apparatuses and services are being used in libraries to organize materials more professionally and fulfill users' needs rapidly<sup>60</sup>. Various studies have substantiated the impact of ICT in different fields.

The global shift towards information society has created a big vacuum in the industries with the new responsibility of documenting knowledge digitally and provision of access".

The reality now is that, since knowledge is indispensable to educational and socioeconomic development of any nation, people should be in the position to access information and knowledge in a format accessible wherever they are. A lot of knowledge is being generated across the globe and for such knowledge to be utilised for development processes, at the international level, it must be converted to a digital resource. The essence of “automating academic library services is to have the ability to deliver effective and unrestricted library and information services to the academic community. In view of this need, the library managements are expected to do extensive investigations in selecting an automation software that will yield desired results for provision of effective library e-services<sup>63</sup>. The slow adoption of ICT in academic libraries to lack of budget, selection of appropriate software and problem of personnel is attributed to poor management”. The software “found in academic libraries in the country varies.

In the field of digital library, the emergence of Internet plus also provides a new opportunity for the development of libraries. With the Web 4.0 technology represented by intelligent technology and Big Data, the new generation of library service platform has begun to enter the market, resulting in the concepts of Internet plus library, intelligent library and Big Data library”. Internet plus library can be seen as realizing personalized service innovation based on user data and user resource. The user community of Online to Offline is introduced into the library. Through the organic integration of online library service and offline library service in physical space, it emphasizes the collaboration of library’s overall services and user interaction<sup>77</sup>. Its four main features include:

Spatial integration and extension: this extension can be seen from two aspects. First, the traditional offline service can be extended to online mode, which cannot only make full use of the network environment to improve service effectiveness and efficiency, but also greatly save unnecessary space and personnel cost. Second, the combination of online

service and offline service can generate more innovation based on service integration. Libraries' physical space also "needs to accept the characteristics of changes caused by internet. For example, according to the situation of library building, resource storage and user's geographical location, the existing resource of library should be allocated more effectively. (2) User driven and autonomic service: in the environment of Internet plus, the driving importance of user requirement in the construction of library resource is increasing. For example, data-driven resource purchasing can give full play to the value of resource construction and maximize the satisfaction of user. At the same time, in all kinds of libraries, the self-service mode is widely used. Users can apply for various services by themselves, such as self-purchase, self-sharing, automatic loan and so on. We have always noticed that the traditional library-led active service mode has gradually shifted to the user-led passive service mode.

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is being generated across the globe and for such knowledge to be utilised for development processes, at the international level, it must be converted to a digital resource. The essence of automating academic library services is to have the ability to deliver effective and unrestricted library and information services to the academic community. In view of this need, the library managements are expected to do extensive investigations in selecting an automation software that will yield desired results for provision of effective library e-services<sup>63</sup>. The slow adoption of ICT in academic libraries to lack of budget, selection of appropriate software and problem of personnel is attributed to poor management. The software found in academic libraries in the country varies. The use of VIRTUA and SLAM in some academic libraries. A study found users of GLAS, X-LIB AND ALICE<sup>64</sup>. Higher users for TINLIB and fewer users for CDS/ISIS was reported. Further to the above, a study found a wider use of INNOPAC, JUJERICA and ALEPH by a group of consortia. KOHA has also been found to be popular and widely used open source software in another study conducted in Nigeria.

Academic libraries crunch new generation talents in the ocean of ideas to build a better citizen through digital literacy education. It effectively helps to accelerate digital literacy education beyond the confines of libraries. In front of emerging ideas students required digital skills and web information searching capabilities. Mastering in communication technology is the solution to ensure digital inclusion and empowerment. The published literature disclosed that Information Literacy (IL) appeared for the first time in Harvard schools in the nineteenth century. Melville Louis Kossuth Dewey, the founders for American librarians and the pioneer of Dewey decimal classification (DDC) for libraries system, emphasized the importance of information literacy (IL) for students and teachers. The emergence of information and communication technology (ICT) in the early 1990s changed the term information literacy to digital literacy. Digital literacy increased people's

awareness of digital tools and media to create and manage new knowledge. Therefore, many scholars, including an effective self-learning (ESL) ability for understanding the role of digital literacy in education. This self-learning ability is also called epistemic cognition or metacognition to assess, plan, manage and improve the students learning skills<sup>65</sup>.

Besides, scholar concluded that the game based digital literacy enhances student learning and scientific knowledge. Therefore, a scholar recommended an integrated ICT program for students in achieving digital literacy goals via skills development. To expand ICT learning, especially using the digital and mathematical capabilities in the correct use of electronic and printed materials for better network integration and models' demonstrations. The self-efficacy using ICT requires a positive attitude under the controlled environment to improve students' learning skills. The autonomous learning of ICT, improved students' digital literacy to acquire knowledge<sup>66</sup>. Similarly, a scholar recommended embedding technology within the existing digital literacy education. In this connection, academic librarians and literacy educators introducing inquiry based learning (IBL) a useful teaching strategy in the curriculum. Librarians are urged to embrace technology actively and play a dominant role in their social, academic and professional fields<sup>67</sup>. Even communication technology has changed the academic library from manual to automation and digital database access. It exposed the professionals' academic and technological competency, training in skills development and guidance on information resources. The technological innovation has linked the student's academic progress with digital skills, browsing databases, effective utilization of resources and running software. Additionally, the digital literacy required standard training to integrate skills into the overall performance to win the social and organizational goals. Digitally embedded education system enhanced digital citizenship and extended students' cognitive skills beyond the classroom. Apart from academic institutions, digital literacy helps in the storage of clinical data, developing of

medical knowledge and implementation of health care services in society. In this connection, the role of librarians in integrating digital resources and providing instruction on information literacy has always remained exemplary. Researchers explored that the retarded library and information science (LIS) curriculum, inadequate IT infrastructure, and training are some of the potential challenges for university libraries.

In this century, digital media have improved the pedagogical capabilities of faculty and students searching skills for lasting academic performance<sup>68</sup>. On the other hand, the development of professional skills is another key area for libraries before starting digital literacy education for students. Digital literacy skills in the twenty-first century are even a manifestation of classroom performance, staff readiness and full participation in the lives of citizens. In Pakistan, the review of published literature on the higher academic institutions showed that these universities are far behind in managing scheduled training program on digital literacy education for the new inductees. In this case, a researcher studied the adverse impact of old technology and scarcity of IT professionals on student academic performance of the few Asian developing countries including India, Sri Lanka, Bangladesh, and Pakistan. Discussing the Pakistani perspective, where 423236 students are getting registration for graduation respectively in public (87.5 per cent), and private sector universities (12.5 per cent) are not adequate for the growing population. The declining position of academic libraries in digital literacy education in Pakistan, India, Nepal, and Bangladesh led to intellectual ignorance highlighted by the Sri Lanka Journal of Library and Information Management. Research in Pakistan's HEC digital libraries highlighted imperfect policymaker plans, ignoring digital and information literacy training for students and employees. Higher education has lagged in providing the technology-related infrastructure in all the academic libraries on digital literacy education. In this context, researchers emphasized to students and elderly intensifying their research skills

via technology roadmaps to upgrade their core skills in learning and problem solving. Because in some countries technology-related anxiety found to be a potential obstacle to citizens due to certain circumstances, such as religious, cultural and traditional beliefs. Especially this tragedy occurred mostly with the female in a predominantly religious and ethnocultural society and minority status in career development<sup>69</sup>.

Pakistan's universities need special managerial plans to accommodate college and university students who do not have digital literacy training and understanding of resource utilization. In this perspective the education system of private colleges improved, where students have an understanding of information and digital literacy due to the standard curriculum. Pakistan currently offered LIS education in 11 universities with outdated curriculum emphasized management rather than information and communication technology and leadership. The degree programs offered by institutes such as the University of Karachi, University of the Punjab, Sind University of Jamshoro, and Islamic University Bahawalpur are lower than market value. Furthermore, lack of technical comfort, administrative negligence and the digital skills of library professionals are also ineffective. Librarian technological skills exposed particularly in the protection of digital content, data security, password, and backup inspections and managing the increasing knowledge. Digital literacy usually developed when librarians, teachers, and professors collaborated on the development of teaching standards.

Besides, the educational institutions, more than 12,000 Deeni Madras "Religious institutions" running under the ministry of religious affairs government of Pakistan also required digital literacy training. The research revealed that these libraries are in a critical state in terms of information management using classification and cataloging standards. Of the 12,000 Madrasas, only 19 libraries provide IT services and 11 libraries are automated,

in which teachers and senior students are resource users. Graduate students and Madras teachers also urgently need education in the field of digital culture and information literacy. By providing students with appropriate and regular training, we believe that the current gap between digital and information literacy education and skills development can be eliminated.

Similarly, the ICTD initiatives in the primary studies of the reviews had the developmental objectives in different dimensions. For instance, it was found that ICTD projects were established with the goals of contributing to social, cultural, economic, human, and political problems. In a systematic review of contribution of ICT for agricultural development, a scholar found that some ICTD studies focused on economic growth, while others concentrated either on the Millennium Development Goals, or people's livelihoods, or the concept of development as freedom of opportunity. In the same manner, scholars investigated the contribution of mobile phones on SMEs based on the economic dimension, while none of the primary studies evaluated the social impact. On the themes utilized by the reviews, the findings indicate that reviewers assessed the following: diffusion of ICTs; use of ICT by SMEs, assessment of financial needs; design and development of ICT applications; and understanding the context including best practices, field experiences, assessment and evaluation, benefits, barriers, and success factors of ICT initiatives<sup>70</sup>. The findings indicate that these reviews fall mainly into two areas, as suggested, which include technology adoption and transfer and social embeddedness. Reviewers who assessed the adoption of ICT noted that this theme is well conceptualized and studied as compared with research on the contribution of ICT for development. Another reviewer noted that there is inadequate research on design and development of ICT applications especially for illiterate people and community involvement in the development process<sup>71</sup>.

There is limited research on the assessment of financial needs in mobile finance research. Indications are that research on the context in which ICTs are applied, and adoption of ICTs are extensively studied and conceptualized, while research on financial needs, design, and development of ICT applications and contribution of ICT for development are comparatively neglected in the reviewed studies. Three reviewers focused on reviewing the contribution of mobile phones for development. Two reviews found a high use of mobile phones as the means used by communities to build their capabilities. For instance, a scholar found a high prevalence of mobile phones as the main tools used by SMEs as compared with computers. Consistently, it was found that more than half of the reviewed papers studied mobile phones, followed by telecenter, general ICTs, and desktop computers. Other types of ICTs assessed by the systematic reviews range from general ICTs, to specific ICTs, such as the desktop computers; telecenters; rural radio; and several types of IS, for example, free text user interface, Geographical Information System (GIS), health IS, e-government, and e-commerce<sup>72</sup>.

We found mixed results regarding the contribution of ICT to development in the surveyed systematic reviews. On one hand, two reviews reported that ICTs are a key contributor to development. For instance, a scholar concluded that ICTs contributed to sustainable livelihood of communities in various aspects, including human, social, financial, physical, and natural assets. Another review found that the principal achieved functioning was access to information and communication services, which can play a key role in developing social and human capital in remote communities. On the other hand, six reviewers reported that ICTs were a key contributor to some dimensions of development during the time of their reviews. ICTs could be used as a tool for SMEs to drive socioeconomic development in areas such as information sharing, enhancement of

business operations, and improved use of assets and structures, resulting in poverty reduction.

However, it was noted that the positive association between ICT and poverty reduction is still questioned from the reviewed theoretical and empirical studies<sup>73</sup>. Another review from South Africa reported that ICT played a key role to some development dimensions (such as agricultural supply chains, the provision of health care for the poor, and development of policies for improving lives of the poor). However, ICTs did not benefit the poor on other aspects, such as e-government direct services and telecenters. Mobile phones increased information flow in the value chain, which translated into reduced price variability and higher profits per actor. However, few studies reported evidence on the contribution of mobile phones in the creation of new business or ability of producers to bypass middlemen. Further, a scholar also found that most benefits derived from the usage of mobile phones seem to be generated from market diffusion (adoption and use). There was less evidence on the extent and distribution of benefits regarding the use of mobile phones for the agricultural and rural development.

Consistently, research on needs and impact of mobile finance is scarce, while research on application design and adoption has been well conceptualized. Similarly, it was found that most researches tend to center around understanding the context in which ICT operates including best practices and experiences, while research on linking ICT initiative with development and design and development of applications for illiterate people is understudied. It is argued that research studies need to address the whole lifecycle of ICT applications development, ranging from user requirements to design, implementation, and evaluation of ICT initiatives, instead of addressing usability issues by end users<sup>74</sup>. What emerges from the reviews outlined above is that the positive linkage between ICTs and

development remains contested in the surveyed reviews as already observed in the literature. While some scholars argue that ICTs have provided tangible benefits to the poor, others argue that the poor cannot benefit from ICTs for a number of reasons.

First, the ICT projects have not attained the required scale, they are either localized or at a pilot stage. Second, they tend to be a practitioner and not academic oriented, and thus, their results are disseminated through publications and not to inform policy. Third, most of these projects are funded by donors or the public, and therefore, their results of impact assessment, monitoring, and evaluation are not made public. Fourth, each of the ICT projects has a different view of development that affect their project development, implementation, use, and outcomes. Fifth, there is an overemphasis on the supply side of ICTs when evaluating the role of ICT for development. This means that most of the assessed ICT reviews focused on analyzing the supply side (eg, benefits of investment in ICT infrastructure), without comparing with the outcomes of the investment for development issues such as education, health, roads, etc<sup>75</sup>.

Broadly speaking, as a revolutionary intermediary force with infinite potential and compatibility, internet can be seamlessly fused and deeply integrated with any traditional object, thus completing the revolutionary transformation of traditional industries. In China, people define a concept called Internet plus (Internet plus) to describe this phenomenon. This includes two aspects<sup>76</sup>. First, the Internet plus will emphasize six core concepts such as cross-border integration, innovation driven, reshaping structure, respect for human nature, open ecology and connecting everything. Second, internet information technologies provide the traditional industry with the ability of communication and computing at anytime, anywhere and on demand, making them more conveniently to use data resource than before, and giving full play to the value of Big Data. These can

eventually generate a new economic form with many characteristics such as product-based, user-oriented, closed-loop of online and offline.

Conferring to this trend, we can boldly imagine that libraries in the future should be more modular and functional, and gradually evolve into various functional units providing independent services. Users can actively access relevant service according to their own interests and needs. From this point of view, library can be regarded as an interconnected structure adapting to the changing environment and user requirement, which can realize the interconnection of user, institution and data, so as to obtain the more recognition of user and realize its own value. We do need libraries that are different from traditional libraries and moving toward new form with realizing new functions. (3) Personalized user service: “the rapid development of internet technology makes it possible for libraries to make full use of users’ personalized characteristics. Each user has a different view of the library. Through Big Data analysis, “libraries can formulate corresponding service content and allocation resource for different user groups to ensure that the cost of user service is proportional to the value of library. (4) Diversity of access: as the most important characteristics of Web 4.0, ubiquity refers to the ubiquitous connection at any time and any space, identity refers to the personalized service provided by identifying user’s context information and connection refers to the consistent and extensive collaboration between users. At this time, a large number of connections can be formed between user and space, user and resource, user and librarian, librarian and librarian and user and user, thus more opportunities and possibilities for library service innovation can be achieved”. The restriction of space layout in the library can be broken through, and the ubiquity and virtualization of the library service place can be implemented.

The idea of Internet plus in library can prompt the deep integration of internet with traditional libraries, and can be helpful in building the intelligent library. The following innovation of library service can be realized: Innovative book purchasing: the traditional book purchasing modes of libraries mainly include bibliographic-based mode, MARC-based mode and live mode”. With the support of internet, digital library can innovate existing purchasing modes and achieve real-time communication of information between libraries, library distributors and publishing organizations, so as to implement unimpeded online interaction between the three upstream and downstream parties. User of library can become supplier’s customer and play the role of interviewer to buy his favorite books. Changsha Library in China began to cooperate with bookstores in 2010 and held several events to purchase the books chosen by users<sup>78</sup>.

In May 2014, Inner Mongolia Library in China also launched a similar activity, which integrates the requirement of libraries and the supply of bookstores into one platform of data cloud. This service is also widely used in other libraries, such as Foshan Library in China”. The library of Harbin Engineering University guides the collection construction and resource purchasing by using the Big Data of users’ behavior. This includes “two aspects One is to use the information of books and the information of readers’ borrowing to analyze the subject, publishing house, type distribution and copy guarantee of relevant books. The second is to use Scopus database to extract the published papers and reference data of key disciplines in this university, and to evaluate the quality of collection and resource guarantee ability of library by analyzing the publication and citation of these papers, so as to guide the subscription to scholar databases and foreign periodicals. (2) Internet plus Maker Space: for libraries with good advantages of internet information service, they should summarize and collate various information resources of innovation and entrepreneurship in the Maker Space, excavate knowledge and information materials

suitable for makers' innovation, and provide periodic or irregular training for makers, so as to further establish perfect new entrepreneurship information support system. The specific types of service include document information service, knowledge consulting service, information assessment service, etc., which also requires libraries to formulate reasonable development plan for Maker Space service, further expand the pluralistic function of Maker Space with technology of internet, emphasize the transformation of innovation and entrepreneurial achievements and enhance the cooperation of library and Maker Space in many dimensions<sup>79</sup>.

ICT skills of LIS professionals at the University of Delhi, India was done. Their study reveals that most of the library professionals had a basic knowledge of ICT. However, they were weak with regard to the use of operating systems and library software. Their study emphasizes that, in order to provide efficient library services, LIS professionals should focus on acquiring ICT-related skills. Studies found that although the LIS students in the developing countries often possess proficient level of skills in basic computer and internet tasks, they exhibit average or poor skills in advanced ICT. For example, LIS graduates in two leading universities in Kenya were found lacked advanced ICT knowledge, competencies and skills required to perform well in their workplaces<sup>132</sup>. A scholar found in their study that the Kuwaiti LIS students possessed basic knowledge and skills in ICT but lacked advanced searching and internet navigation skills. The scenario is not different in the case of university students in other disciplines in Kuwait. A survey of the science and social science undergraduates (n = 281) in two colleges at Kuwait university was carried out to know their perceptions of their skills in using information technology and the internet. As the data collection instrument, the study used a (self-constructed) questionnaire consisted of 22 questions. The trend in results was that the students perceived their skills as good in www, email, and general computer-related tasks.

However, in advanced computer and internet skills, the estimates were at the average level. They perceived poor skills in case of more technical tasks, for example, in web design software<sup>133</sup>.

A researcher surveyed undergraduate students (n = 238) of two LIS schools in Nigeria. One of the objectives of the study was to know the self-reported ICT skills of the undergraduate students through a (self-developed) questionnaire. Eight affirmative statements were used to measure the perceived skills of the students. There were only three alternative answers to report- “agree,” “disagree,” and “undecided.” All the eight items were for measuring basic computer and internet skills. For example, item 2 is a typical one: “I can use a mouse, pointing device and keyboard.” Nonetheless, the authors concluded that the LIS students possessed ICT skills<sup>134</sup>. A survey in a LIS school in Nigeria and found adequate ICT infrastructure and sufficient courses with ICT components in the school was conducted. However, the students’ (n = 80) responses indicated that they did not perceive to have adequate knowledge and skills in computer applications, search engines, media resources, and using and cataloging e-resources. Students in the state-owned universities of Nigeria had limited access to ICT facilities and thus exhibited poor skills. Furthermore, the LIS curricula in Nigeria were not supportive of developing ICT competencies among the graduates to make them capable of performing their professional duties efficiently in modern libraries, information and document centers<sup>135</sup>.

Women have less opportunity than men to access to ICT in both developing and developed countries. Gender digital divide exists among the people of all ages around the world and is deep-rooted in existing socialization patterns. Thus, male students possess better computer and internet skills than their female counterpart. ICT literacy of Serbian (n

= 226) and Slovakian (n = 216) students in higher education using a self-report questionnaire. The questionnaire included 15 items and a 4-point Likert scale. The study found significant gender differences in ICT literacy; Serbian male students had a higher score in twelve items than the Serbian female students, and Slovakian male students possessed better skills in nine items than their female counterpart did<sup>136</sup>. Based on a self-report study of 834 undergraduate students in Thailand, a scholar reported that the males affirmed higher level of computer self-efficacy beliefs than the females.

Using a self-report questionnaire, a researcher conducted a survey of 465 university students (220 Chinese and 245 British students) on computer and internet use. Gender differences were found among both British and Chinese students; the male students used the internet more frequently than female and thus reported higher skills in the internet than the female students. In case of computer use, more extensive gender differences were found among the British students than the Chinese students. About 80 percent of the Chinese female students agreed that “men spend more time on computers and surfing the internet than women.” Chinese male students perceived higher skills in both computer and the internet than the females; however, British males reported higher skills than females only in using computer. Nonetheless, contrary results were also found, for example, analyzing the data of 228 students from 30 HEIs in Mexico, it was found that female students’ perceived ICT competencies were higher than the male students. Moreover, some researchers asserted that though male students’ perceived internet skills are higher than that of the female students, there is no gender difference in the performance-based skills<sup>137</sup>.

In May 2013, the opening of Creating New Space of Shanghai Library marked that Maker Space formally entered the Chinese public library field. At the end of 2015, the Maker

Space established by the library of Shanghai Jiao Tong University and Jingdong marked the beginning of the development of Maker Space in Chinese academic libraries. By the end of 2016, 1,337 entrepreneurs have been certified by the Ministry of Science and Technology of China, covering e-commerce, smart hardware, finance, health care, social networking and other fields<sup>80</sup>. The same is true abroad. According to the “data from the Association of Research Libraries survey in 2015, 64 percent of North American libraries are providing Maker Space service and 17 percent began the attempt of this service”. Digital Service Center: modern digital libraries use digital space integration and service innovation to provide data management service, virtual and real space service, virtual and real collaboration service and acquisition service of digital resource, so as to better meet the increasingly requirement of specialized data service of users. This integration, “transformation and innovation can ultimately realize the transformation and upgrading of digital libraries from data storage center and data distribution center to modern data research center and enable digital libraries to actively participate in the process of knowledge creation in user’s research and work, realize the transformation from information service to knowledge innovation, and finally realize the transformation from information management service to digital research support.

The metrics for measuring ICT skills include, ICT usage, computer availability, use of internet Technology and use of Microsoft Word and other packages.

### **2.2.3 Information Literacy Skills**

Information literacy (IL) skills are vital for getting the required information to fulfill scholastic needs. IL skills play a significant role in accessing and disseminating the needed information. In particular, “information literacy is important in this age because it helps us to adjust by giving us the ability to recognize when we need information and where to find it effectively and efficiently<sup>83</sup>. Due to reckless growth in information, students are facing

difficulties in locating their desired information”. This information explosion has “caused serious issues regarding the authenticity, and reliability of the information as well. The information literacy term typically defined as a skill to set the need for information, how to locate desired information and its assessment, currency, and authenticity, then use it in decision making. A study at the University of Botswana revealed that the graduate students depended intensely on library books and journals to make foundations of information for their course-work. Further, it was observed that the students were more involved in the adoption of technologies, therefore, web-based instructions could be used for inculcating information literacy skills among the students<sup>84</sup>.

The core purpose of the academic libraries is to support teaching, learning and research activities which are only possible by providing access to the required information and related resources. The study have further emphasized the vital role of academic libraries in the students’ learning and performance in their studies<sup>8</sup>. In recent years, research regarding information literacy skills has attracted the attention of Pakistani academics, practitioners, and researchers. In the age of information explosion, students need more IL skills and experts to make choices about the tools to locate their relevant information. IL promotes and blooms a resource-based learning environment in which students make tangible and effective decisions about appropriate sources of information. IL further decreases the students’ reliance on library and information professionals (LIS) and strengthens the ability to play with information with maximum confidence and bravery.

Information literacy (IL) term appeared firstly in early 1970 when a scholar used the new term IL to describe the "techniques and abilities" known to the information literates. Different authors, “knowledge organizations and groups offered different meanings, principles, frameworks, and expectations in information literacy<sup>85</sup>. The rapid growth of

information services makes it important for the citizen to be literate about information". In the customary perception, an individual is measured educated who is able to read and write. As technologies progressing, intelligence is becoming increasingly complex. Educators feel the need of learning to engage them in dealing with the information along with other learning processes. Information literacy as a procedure of skills that empowers a person to examine access, investigate and use information. Information literacy is a powerful concerned with learning, in-depth thinking, and to learn concepts of education. In a study, it was revealed that the notion of knowledge literacy amongst the students was misconstrued.

A few students (27%) acquired information literacy as ICT (Information Communication and Technology) and reflected that both terms are the same, whereas precisely (25%) were not sure about both perceptions". Faculty and library staff can play an important part in the improvement of students' information literacy skills. Sessions with respect to library rules need to be more frequent, and LIS specialists can also create enhanced outcomes.

A scholar conducted a study to evaluate education programs in the universities of Pakistan and noticed that only 40 percent of libraries gave their students sufficient user education programs. Major focus of the libraries was on providing orientations and library tours to the new entrants". A scholar conducted a study of M. Ed. Students by using pretest and posttest tool and reported the significant impact of the training. Students highlighted the issues faced and training improved their skills<sup>87</sup>.

In a study in Punjab University students had limited computer and internet knowledge and suggested instruction with respect to user searching techniques. He further suggested that such instructional programs should be designed for students at all levels of Pakistan. In a study of graduate students from two Lahore universities and concluded that the students

preferred online resources on a library visit<sup>88</sup>. The students claimed in this research that they had adequate skills to understand and explain the information required but the study suggested IL instruction for the students to become lifelong learners in finding, interpreting, arranging and using it for their future needs.

LIS researchers have also discussed some of the major IL issues. Lack of interest among students in the quality of information literacy is a concern for the progress of information literacy. Furthermore, the lack of awareness of information literacy, the lack of cooperation between librarians and faculty are the major issues. In addition, the poor information literacy skills of the academicians are also an issue. LIS experts' reluctance to conduct instructional programs and poor training assessment plans are also among the issues in inculcating the information literacy contents effectively. Another issue is the lack of systematic orientation methods for students about library resources and their services. There is an absence of mindfulness among students about the information literacy sessions on offer. Other factors that weaken the efficiency of imparting IL skills are the lack of practical approach of librarians, lack of partnerships between librarians and teaching staff to streamline IL and convenience of resources. It is evident from the relevant literature that Information literacy is one of the areas of interest of the present era.

The ICT sub-area measured in the Technology and Engineering Literacy (TEL) assessment as part of the National Assessment of Educational Progress (NAEP) in the United States includes proficiency with computers and software learning tools, networking systems and protocols, hand-held digital devices, and other technologies for accessing, creating, and communicating information and for facilitating creative expression. It also identifies five subareas of competence: construction and exchange of ideas and solutions; information research; investigation of problems; acknowledgement of ideas and

information; and selection and use of digital tools. There have been several approaches to the assessment of computer literacy, including traditional multiple choice and constructed-response items, and performance assessments.

Many of the assessments focus on lower secondary-school students, and that most of them are computer-based and measure aspects such as searching, retrieving, and evaluating information, as well as technical skills. They also noted that many of these assessments include performance assessments in which students are required to perform tasks on a computer, with those tasks being embedded in a narrative. ICILS 2013, involving grade 8 students in 22 countries, is one example of this approach to the assessment of computer literacy. Other examples of studies using this type of assessment strategy include the national assessments of computer literacy conducted every three years among grade 6 and grade 10 students in Australia since 2005<sup>92</sup>.

ICILS defined CIL for use in ICILS 2013 with reference to definitions and constructs associated with information literacy and computer literacy. Information literacy “constructs developed first through the fields of librarianship and psychology and are acknowledged as having the following processes in common: identifying information needs, searching for and locating information, and evaluating the quality of information. Information literacy constructs evolved to include the ways in which the collected information can be transformed and used to communicate ideas. Early conceptualizations of computer literacy in education typically focused not on the logical reasoning of programming (or the syntax of programming languages) but rather on declarative and procedural knowledge about computer use, familiarity with computers (including their uses), and, in some cases, attitudes toward computers”. Since that time, the concept of CT

has gained increasing prominence across education systems, with perhaps some of the inevitable definitional confusion that comes with new (or renewed) curriculum areas<sup>93</sup>.

People can be information literate in the absence of ICT, and the information literacy of young people, has not improved with the widening access to technology: in fact, their apparent facility with computers disguises some worrying problems. The CIL skills measured and reported on in ICILS, however, address computer literacy skills in the context of information literacy as applied to digital information sources. They reflect a combination of skills that, given the pervasiveness of digital information, continue to have a high profile in contemporary frameworks. For example, the revised DigComp framework (DigComp 2.0) described digital competence in terms of five competences: information and data literacy; communication and collaboration; digital content creation; safety; and problem solving<sup>95</sup>.

However, much money, time and effort have also been invested in running information literacy skills in order to equip the students with necessary skills and information that will enable them to access, evaluate and use the needed information efficiently and effectively. Do students find the training to be useful and effective in doing their searching, accessing, evaluating, and using the information resources? A study, it was found out that students may perceive information literacy skills at the beginning of the new academic year to be useful, and very often but they are not aware of their information needs<sup>12</sup>. Meanwhile, the goal of the study was to discover the postgraduate students' perceptions, usefulness and effectiveness of information literacy skills and to find out whether the information skills session is useful and effective among those who attended and also to find out whether there is a relationship between perceived usefulness and effectiveness of information literacy skills.

A scholar reports the findings of a research project that has analyzed how Danish universities store, preserve, and provide access to research data. An example of “disciplinary that was described as some of the problems that leads to poor replicability of social sciences research. Information sharing is undoubtedly a complex issue because researchers have a number of reasons not to share their data. For instance, documenting data is extremely labour intensive. However, the main reason is lack of interest, caused by the well-known fact that in most fields of scholarship the rewards come not from data management, but from publication<sup>102</sup>. Greater openness apparently requires researchers to shift from perpetual proprietary control, to overcome their fears of misuse or misinterpretation. In addition, each discipline has its own ‘information culture’ and some data may be more uniform in their form and therefore more easily transferable than other idiosyncratic formats. Issues of security and control also play a role here. Overall, there may be a tension between funder and publisher requirements for data sharing and the technical and cultural barriers that inhibit such sharing. Nevertheless, the scholarly community is moving inexorably toward improved access to research data and this evolution affects every part of the research process.

In the same way as the library has traditionally facilitated access to documents, today information professionals could facilitate access to data, even though data do not necessarily fit into the same, document formats that libraries used to offer<sup>103</sup>. The tsunami of data or data deluge lays a charge on libraries, in particular academic and research libraries”. This possible involvement of libraries in data-related activities was identified early”. For instance, the boundaries between published literature and research data are disappearing which gives opportunities for librarians to create, maintain, and develop integrated information resources. It was emphasized that libraries have an opportunity to create a new profile on campus as a partner in knowledge creation because there is a

convergence between data-intensive science, technological advances, and the expertise of librarians, which can make them more visible in the knowledge creation process.

Accordingly, librarians should be placed at all stages in the research planning process and provide expertise in developing data management plans, identifying appropriate data description, and creating preservation strategies. The Association of Research Libraries (ARL) declared that academic libraries are in a favourable position to help researchers meet the challenges of a data-intensive research paradigm because they are increasingly providing data consultation services and have experience and skills in fostering cross-departmental, cross-campus, etc. communication and collaboration, needed for effective research data management. It is underlined that librarians are familiar with the research data needs of researchers and have been among the supporters of innovative publishing models, including open access publishing. They are already involved in acquiring necessary abilities to manage data<sup>104</sup>.

On the other hand, a scholar expressed the opinion that the expertise of librarians in collection development, information organization, resource discovery, repository management, and digital preservation is extremely useful. These provide the “foundation for being able to help researchers in the creation of better outputs in the form of more useful data and thus libraries can participate in the phase of research that precedes publication<sup>106</sup>. Besides this, libraries have been historically attached to providing quality information. This predestines them to the critical role of being information quality hubs, by providing data quality auditing and verification services for the research communities.

A different point of argument was “identified as libraries collect and preserve textual material. This fact did not mean in the past that librarians would have been involved in teaching people to read. However, data is different, because reading information requires skills that librarians may need to teach to users in order to help them seek and acquire

meaning from it. As late as 2014, we repeatedly find the argument that the use of data resources is a key area, where libraries and librarians can take a leadership role.

In fulfilling this role, the inclusion of information literacy is said to be essential. In 2012, a working group of the Association of European Research Libraries (LIBER) declared that libraries should assist faculty with the integration of data management into the curriculum". To enable this, 10 recommendations on research data management have been published, which underline, among others, the importance of re-skilling librarians. Re-skilling is utterly important not only because information professionals have to be prepared for new roles to support the complex scientific systems, but also for practical reasons very few libraries are able to hire new, specialized staff. Consequently, the role of a data librarian and other data professionals can be fulfilled by re-skilled information professionals, even though being a data librarian may be a profession in itself<sup>62</sup>. As to competencies, there may be a need for technological competencies that range from database design and content management, to data mining and programming. Even though the level of required domain expertise and technical know-how needs further investigation, there is agreement that a breadth of skill sets is needed, including personal, interpersonal, and managerial abilities.

If libraries aim to "become quality hubs, as noted above, it is paramount to know how information-intensive research can produce information of satisfactory quality. This is the reason that appropriate attention has to be given to information quality. The difficulty is in the appraisal of information, which requires deep disciplinary knowledge. In addition to this, manually appraising information sets is very time consuming and expensive, and automated approaches are in their infancy<sup>105</sup>. Nevertheless, information quality is one of the cornerstones of the information-intensive paradigm of scientific research that is

determined by multiple factors. The first is trust, which is complex in itself. The elements of trust include the lineage, version, and error rate of information, and the fact that they are understood and acceptable. By reviewing quality attributes extensively, trust depends on subjective judgments of the authenticity, acceptability, or applicability of the information; and is also influenced by the given subject discipline, the reputation of those responsible for the creation of the information, and the biases of the persons who are evaluating the information. It is also related to cognitive authority, which has two levels. At an operational level, cognitive authority is the extent to which users think that they can trust the information.

On a more general level, cognitive authority refers to influences that a user would recognize as proper because the information therein is thought to be credible and worthy of belief. The next factor of information quality is authenticity, which measures the extent to which the information is judged to represent the proper ways of conducting scientific research, including the reliability of the instruments used to gather the information, the soundness of underlying theoretical frameworks, the completeness, accuracy, and validity of the information. In order to evaluate authenticity, the information must be understandable. The presence of sufficient context in the form of documentation and metadata allows an evaluation of whether the information is understandable". To achieve this, "information has to be usable. To make information usable, it has to be discoverable and accessible; and be in a usable file format. The individuals judging data quality need to have at their disposal an appropriate tool to access the data, which has to show sufficient integrity to be rendered. Integrity of data assumes that the data can be proven to be identical, at the bit level, to some previously accepted or verified state. Data integrity is required for usability, understandability, authenticity, and thus overall quality<sup>106</sup>.

The study also emphasized on the metrics for information literacy skills such as, defining the kind of information needed, locating the right information, selection of appropriate information, organizing the information, presentation of information and accessing the information<sup>121</sup>.

## **2.3 Theoretical Review and Framework**

### **2.3.1 Technology Acceptance Model**

Electronic library can be accessed from anywhere at any time, with complete freedom. Therefore, due to the uniqueness of these resources, it is imperative to examine the acceptance of new technology by its varied users in the library. The researcher considered the Technology Acceptance Model (TAM) as one of the decision-making models in

technology innovations and relevant to this study. Technology Acceptance Model (TAM) assumes that beliefs about usefulness and reason of use are always the primary determinants of information technologies adoption in organizations. According to TAM, these two determinants serve as the basis for attitudes toward using a particular system, which in turn determines the intention to use, and then generates the actual usage behavior. The attributes of TAM used in this study are: perceived usefulness, which is defined as the extent to which a student believes that how long in using a system would enhance his or her academic performance and perceived reason of use, which refers to the purpose to which a person use a system would be free of mental efforts<sup>113</sup>.

Students' individual characteristics are the importance and personal relevance that users attach to a system. In a study on elements of electronic system Success Model and Technology Acceptance Model (TAM) will be adopted to examine the usage of electronic library resources among selected polytechnics in Osun State, Nigeria. The main reason to accept these models is research theoretical framework is due to effectiveness and simplicity of TAM and electronic system Success Model. The models have received empirical support for robustly predicting technology adoption in various contexts and with a variety of technologies<sup>114</sup>. Elements of electronic system Success Model and TAM have been applied into many context and fields of investigating user's acceptance of information technology including mobile banking, multimedia, e-learning and ecommerce.

### **2.3.2 Diffusion of Innovation Theory (DOI)**

Diffusion of Innovation Theory (DOI) is concerned with the manner in which a new technological idea or technique either old or new migrates from creation to use. DOI describes the social process of communication of a new idea among the members of a community over time. The focus of the theory is not only on awareness and knowledge, but also on attitude change and the decision making process that leads to the practice or

adoption of an innovation<sup>115</sup>. The concept of DOI is one of the most popular theories for studying adoption of information and communication technologies (ICT) and understanding how ICT innovations spread within and between communities. Diffusion is defined by Rogers as the process in which an innovation is communicated through certain channels over time among the members of a social system; in this case among students of polytechnics in Osun State. The core of Rogers's theory lies on innovation and communication skills. Diffusion of innovation enabled researchers to explore how, why, and at what rate new ideas and technology spread through cultures. The origins of "the diffusion of innovation theory are wide-ranging and cover multiple disciplines. It is therefore essential that innovation diffusion models are derived for various cultures. Diffusion of Innovations seeks to explain how innovations are taken up in a population. An innovation is an idea, behaviour, or object that is perceived as new by its audience.

Rodger's model can only be applied after adoption is complete, it has no predictive capability". Although with some modification, DOI has been applied in various instances of ICT applications and has been found useful. The theory was criticized because it is not exclusively concerned with information technology like TAM, and does not give an explicit explanation of users' acceptance of an innovation and was therefore not suitable for the present study.

### **2.2.3 Theoretical Framework on Information Literacy**

Several frameworks and models have since been developed on information literacy in different countries". Some of them are: "the Standing Conference of National and University Libraries (SCONUL) (1999) in the UK, the Association of College and Research Libraries (2000) in the USA, the Council of Australian University Librarians (CAUL) (2001), the Library and Information Association of New Zealand Aotearoa (LIANZA) (2002), and the National Institute of Library and Information Science (NILIS)

(Wijetunge and Alahakoon, 2005) in Sri Lanka<sup>116</sup>. This study focuses on the five information literacy standards reviewed by the Association of College and Research Libraries (ACRL) (2000) and approved by the Board of Directors of the ACRL. They are: Standard One: “The information literate student determines the nature and extent of the information needed. Standard Two: The information literate student accesses needed information effectively and efficiently. Standard Three: The information literate student accesses needed information and its sources critically and incorporates selected information into his or her knowledge base and value system. Standard Four: The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose. Standard Five: The information literate student understands many of the economic, legal, and social issues surrounding the use of information and uses information ethically and legally.

## **2.4 Review of Empirical Studies**

### **2.4.1 ICT Skills and Electronic Library Patronage**

The term “information and communication technology (ICT) is a term that refers to the merging of two previously separate disciplines: information technology and telecoms. As a result, information and communication technology (ICT) refers to the convergence of audio-visual and telephone networks with computer networks, and the technology covers a wide variety of activities, from office data processing to remote monitoring and control of robotics production<sup>117</sup>. It also includes the cable equipment, such as optical fiber, which transport voice, data, and video. The internet, “a content distribution network comprised of a global system of interconnected computer networks via which data is exchanged, is a key offshoot of the convergence of information and communication technology. It was revealed in their findings that a high number of undergraduates possessed ICT skills such as startup/logon/shutdown computer systems, downloading information resources from

databases, bookmarking web addresses, and easily finding information using the world wide web. More so, the ICT skills have a positive effect on Undergraduate students' use of library information resources in the two universities. According to a psychological study, “a human can comprehend 80% of knowledge visually, 15% through hearing, and 5% through the other senses. As a result, “it becomes vital to convey the content in an appealing manner.

A scholar concluded in their study that providing suitable ICT facilities in academic libraries in Kwara State will revolutionize effective information service delivery and advance the use of ICT in day-to-day library activities, resulting in drastically improved information provision to library users. The importance and application of ICT can be seen in the circulation unit where automated system were used to borrowing and receiving borrowed library resources which was usually quick and forthright. The system may signal a transaction's complexity, such as when you are unable to issue an item to a borrower. Although the system will nearly always provide you with accurate information about the borrower's status and borrowing actions, the underlying causes may not be reflected on the page<sup>118</sup>. A study carried out stressed the elements that influence undergraduate students' use of the university library's OPAC and revealed that the major factors include: getting quick access to library collections is a part of using library software, and using library software is a part of using library software to access information resources in the library, the library software user interface allows for easy retrieval of information materials, time-saving of library software usage, and possession of the library's software's ability to be used.

A researcher opined that undergraduate students' library patronage in universities is heavily influenced by their information technology skills. They further stated that the vast

majority of those surveyed had basic computer skills like the use of mouse right-click menu function, how to save, print, and preview document, and possesses information technology skills such as searching online databases and use of OPAC to search for information sources amongst others. However, it was also informed that there was a lack of proficiency in the usage of Information and Communication Technology among students<sup>119</sup>. Networks were starting to emerge, making it feasible to look for titles in other libraries from afar". Online forums and e-mail are the most frequently used Internet resources among students and faculty". The findings of the study revealed further the level of accessibility provided to students in need of electronic resources and it was discovered that Unilorin library provides easy accessibility of e-resources to students through software that is user-friendly and simple to operate (54.7%).

Electronic information resources are a valuable asset to the library since they allow students to access scholarly knowledge more easily, and lack of understanding and weak ICT abilities can obstruct the effective use of EIRs. More so, they decided that medical librarians should play an important role in assisting and orienting medical students in the use of electronic information resources, as well as conducting awareness campaigns and creating a suitable environment for students to use electronic resources<sup>120</sup>.

Some interactive online platforms, such as Twitter, Facebook, and LinkedIn, are currently operating as a communication forum for librarians and their users. These networks could be used in educational settings. Library services are also aided through discussion groups, list serves, and communities. Information and communication technology (ICT) can be used for accessing, processing, gathering, modifying, and presenting or sharing data in the library. These could include software, hardware, and even internet connectivity. With ICT, Through networked systems, library users can access information of many forms such as online databases, e-journals, e-books, and government publications. Remote access can be

granted through the internet or intranets. Libraries may no longer be able to distribute papers to customers or do interlibrary lending using postal services. Libraries provide papers to users using electronic networks that can deliver documents in a variety of formats, such as PDF, directly to their computers<sup>121</sup>.

Apart from resulting in an increase in electronic information, the transition from print to electronic media has offered users with new tools and applications for information finding and retrieval. More so, ICT skills as the abilities for the collection, effective processing, storing, transmitting, and the dissemination of information which enables the application of computers and allied technology to achieve personal academic and career goals<sup>122</sup>. Because of the low utilization of ICT, library operations are not as effective and efficient as they should be. They further stated that poor internet connectivity, power outages, and insufficient information retrieval abilities are all obstacles to using the meager ICT accessible. More so, they recommended that the management's direction, library users' attitudes, the types of materials available, and the nature of research and development in institutional libraries are all essential elements that can encourage ICT use.

Through the application of ICT in the library, libraries can educate its patrons or run information literacy programs by using the internet or CD-ROMs. Virtual tours can be delivered via the internet, making user education more accessible to everybody. Some services, such as SDI (Selective Dissemination of Information) or Current Awareness Services (CAS), virtual reference desks, new acquisition announcements, and other reader advisory services, can be made easier via the internet. Application of ICT to library operations enables online databases such as AGORA and ERIC can be searched. To supplement library resources, use search engines, metasearch engines, and subject directories to browse and cruise the internet. ICT allows networking among librarians thus

librarians are increasingly connected to one another, allowing them to share ideas, resources, and enhance teaching procedures, as well as connecting libraries to the rest of the world. Thereby improving their skills and motivating them, as learning is extended outside the classroom, allowing for the establishment of appropriate real-life context<sup>123</sup>.

In a study on the undergraduate student use of electronic information resources and Information literacy skills that undergraduate students do not make extensive use of the available electronic resources, and their academic background has had no impact on their utilization. This is due to a lack of knowledge of the library's electronic resources. They concluded that some inhibiting effects on the use of e-resources, such as unavailability and inaccessibility to resources, lack of knowledge and training, lack of essential computer skills, and unpredictable power supply, computer literacy has a significant impact on the use of e-resources. Due to rapid advancements in the technology environment, an increasing number of academic libraries have started to use digital technologies and resources. Looking at their infrastructure, libraries now allocate more space to ICT-related facilities and services. Moreover, they are offering automated circulation services and online digital reference services<sup>124</sup>. It is because of ICT that libraries are not restricted to their physical walls and people can consult essential information resources from anywhere in the world. Technology has also transformed the role of librarians from a traditional to modern role.

Cataloguing has a vital role to play in library operations, and applying ICT to cataloguing has made this work much easier, saving time and being more accurate than manual card or book records. Today, library and information science (LIS) professionals are using machine-readable cataloguing (MARC) standards for electronic cataloguing. Remote library catalogues are accessible to users through the Internet. A positive approach on the

part of library professionals towards ICT applications and their usage in providing library services, but mostly LIS professionals did not have opportunities to develop their skills and competencies in their prescribed work. According to him, librarians' skills will define the future of academic and research libraries<sup>125</sup>. Considering the advancements in ICT, the adoption of new ICT skills, as well as library management skills, is necessary for LIS professionals and subordinate staff. In other words, the skills of LIS professionals must be in accordance with the technological infrastructure. Knowledge and skills required by academic librarians include 'digital library development and handling of softwares', technical support, quality standards, HTML coding, web mark-up languages such as SGML (Standard Generalized Markup Language) and XML (Extensible Markup Language) and in some extent skills in programming and scripting languages. Given the above scenario, many researchers have conducted studies on the ICT skills of LIS professionals.

A study was carried in Nigeria to determine computer self-efficacy as a predictor of ease of use in librarians' routine library operations. The findings of this study reveal that a majority of the respondents were self-efficacious with regard to computer skills, and that there was a significant positive relationship between computer related self-efficacy and the use of computer-based libraries by the library staff. It was also claim that his study was helpful not only for the librarians, but also for the IT staff, university management and system administrators. The awareness of ICT skills among library professionals in Tirunelveli district, Tamil Nadu, India was studied<sup>129</sup>. Their findings reveal that due to an increasingly automated environment, LIS professionals needed to focus on training in the use of ICT-related equipment. Training in the use of the library's software was extremely important. The provision of hardware and software, and subscription to electronic databases are also highlighted in their study.

A scholar conducted on computer competencies as a predictor of the performance of lecturers in using electronic publications for research in university libraries in Nigeria<sup>130</sup>. It was observed that the lecturers had sufficient computer related competencies to complete their scholarly tasks. Computer-related skills were proved to forecast lecturers' utilization of scholarly electronic publications. In light of their observations, it was recommended that there is a need for training in ICT skills so that lecturers may use the scholarly publications more effectively, thereby enhancing their performance. In a study on ICT usage as a predictor of lawyers' work productivity. The adoption of ICT had enhanced the performance of lawyers working in several law associations through the speedy provision of justice in the courts of Nigeria was observed. The researcher also observed that the law profession in Nigeria was facing many challenges. He emphasized that there is a need to adopt ICT skills to enable rapid access to legal information by judges, lawyers and researchers. He also recommended that the government should provide such opportunities and facilities in that may help in appropriate usage of ICTs<sup>131</sup>.

ICT skills of LIS professionals at the University of Delhi, India was done. Their study reveals that most of the library professionals had a basic knowledge of ICT". However, they were weak with regard to the use of operating systems and library software. Their study emphasizes that, in order to provide efficient library services, LIS professionals should focus on acquiring ICT-related skills. Studies found that although the LIS students in the developing countries often possess proficient level of skills in basic computer and internet tasks, they exhibit average or poor skills in advanced ICT. For example, LIS graduates in two leading universities in Kenya were found lacked advanced ICT knowledge, competencies and skills required to perform well in their workplaces<sup>132</sup>. A scholar found in their study that the Kuwaiti LIS students possessed basic knowledge and skills in ICT but lacked advanced searching and internet navigation skills. The scenario is

not different in the case of university students in other disciplines in Kuwait. A survey of the science and social science undergraduates (n = 281) in two colleges at Kuwait university was carried out to know their perceptions of their skills in using information technology and the internet. As the data collection instrument, the study used a (self-constructed) questionnaire consisted of 22 questions. The trend in results was that the students perceived their skills as good in www, email, and general computer-related tasks. However, in advanced computer and internet skills, the estimates were at the average level. They perceived poor skills in case of more technical tasks, for example, in web design software<sup>133</sup>.

A researcher surveyed undergraduate students (n = 238) of two LIS schools in Nigeria. One of “the objectives of the study was to know the self-reported ICT skills of the undergraduate students through a (self-developed) questionnaire. Eight affirmative statements were used to measure the perceived skills of the students. There were only three alternative answers to report- agree, disagree, and undecided. All the eight items were for measuring basic computer and internet skills. For example, item 2 is a typical one: I can use a mouse, pointing device and keyboard. Nonetheless, the authors concluded that the LIS students possessed ICT skills<sup>134</sup>. A survey in a LIS school in Nigeria and found adequate ICT infrastructure and sufficient courses with ICT components in the school was conducted. However, the students’ (n = 80) responses indicated that they did not perceive to have adequate knowledge and skills in computer applications, search engines, media resources, and using and cataloging e-resources. Students in the state-owned universities of Nigeria had limited access to ICT facilities and thus exhibited poor skills. Furthermore, the LIS curricula in Nigeria were not supportive of developing ICT competencies among the graduates to make them capable of performing their professional duties efficiently in modern libraries, information and document centers<sup>135</sup>.

#### **2.4.2 Information Literacy Skills and Electronic Library Patronage**

Public librarians should be equipped with not only information technology (IT) skills, but also transferable information literacy skills. As suggested, emphasis should be placed on the need to teach students ‘big picture’ topics, such as how to really be able to keep up with technology, make good decisions about its implementation, use it and sell it to others.

In a study, public librarians should be prepared to develop in other areas, such teaching and instruction, leadership, collaborating, and building partnerships (American Library Association Office for Information Technology Policy). For example, managing projects effectively requires a basic understanding of the public policy process, management and leadership, budget and finance, and program evaluation. Promoting ideas/library services it means working effectively with local communities and the ability to lead change is necessary for advocating the value of continuing education and life-long learning. Some of these skills “are particularly important as more public libraries participate in local and national initiatives and discussions on Internet policies, information literacy skills, broadband access and open data, acting as the link between underserved communities and the potential of the Internet<sup>139</sup>.”

Other scholars who realised the importance of gradations and multiple dimensions by focusing on differential access *to* skills and usages<sup>140</sup>. By analysing Dutch official statistics the authors point to age and gender gaps. Scholars outline four types of access gaps: lack of elementary digital experience, no possession of computers and network connection, lack of digital skills and lack of significant usage opportunities. Trying to tune into the nuances “of this divide, and in order to have a better assessment of digital divides, they aimed at examining the life experiences and mental barriers of people when using the internet”. They proposed the ‘strategic skill’ which according to them is the ability to use

digital means to improve one's position in society, in work, education, and cultural practices<sup>141</sup>. This strategic skill is related to people's social capital and resources.

After internet use and ownership of computers and mobile devices became widespread in many areas of the world, scholars noticed that divides were still prevalent, and started to examine other issues that might be at play, for example the types of use<sup>142</sup>. The second wave of scholarship around digital divides has focused on multidimensions and multidisciplinary of digitally related inequalities. The expansion in research interests started "to include the view that other dimensions have influence on digital inequalities, such as political economy, gender, internet cultures, class and status and effects of life courses such as aging, parenting and prison rehabilitation.

The third wave can be framed as new divides and negative consequences on society as it became clear that the digital divide was not a static phenomenon but one heavily influenced by changes taking place on both the national and the global level (uneven development of the internet connection in different regions, the growth of e-commerce and e-democracy, changing audience behaviour and consumption practices under the influence of non-linear digital services, the spread of digital content flows, etc. Others call this a third level digital divide whereby the possibilities that the Internet offers to citizens in economic, political, social and cultural areas are not exploited by everybody in the same way. Social strata that already enjoy social advantages become further privileged. The Internet influences "possibilities for citizens to improve their life chances, but in a vicious circle, based on their original social position<sup>143</sup>. This stage can be characterized as focusing on intersectional inequalities.

A new framework to discuss such issues has arisen from data justice, led by the scholar argue, the concept of data justice is a response to various societal consequences of data

driven technologies and services. As they suggest, the framing of 'data justice' helps to open the debate to multiple fields such as inequalities, discrimination as well as automation and algorithmic decision-making. They aim to pay particular "attention to structural inequality, highlighting the unevenness of implications and experiences of data across different groups and communities in society<sup>144</sup>.

The conceptual model of this study was developed "based on the title of the research which is the influence of ICT Skills and Information Literacy Skills on Electronic Library Patronage by Students in Selected Polytechnics in Osun State, Nigeria. The independent variables are ICT Skills and Information Literacy Skills; ICT Skills was measured with ICT usage, computer availability, use of internet technology and use of Microsoft word and other packages<sup>115</sup> while Information Literacy Skills was measured with defining the kind of information needed, locating the right information, selection of appropriate information, organizing the information, presentation of information and accessing the information<sup>90,105</sup>. The dependent variable is Electronic Library Patronage which is measured with frequency of use of library and purpose of use of library<sup>113</sup>. Therefore, the three hypotheses were linked as follows: hypothesis one; ICT Skills influencing Electronic Library Patronage, hypothesis two; information literacy skills influencing electronic library patronage and the combined influence of ICT Skills and Information Literacy Skills influencing Electronic Library Patronage in hypothesis three. Overall, these formulated hypotheses will be subjected to a statistical test to determine the direction of results, conclusion, and possible recommendations for this study.

#### **2.4.3 ICT Skills and Information Literacy Skills on Electronic Library patronage**

ICT skill refers to the ability of fully understanding and acquiring a wholeness of capacities, such as recognizing, spotting, evaluating and making effective use of the given information. In order words, one should possess not only the basic ICT skills deal with the

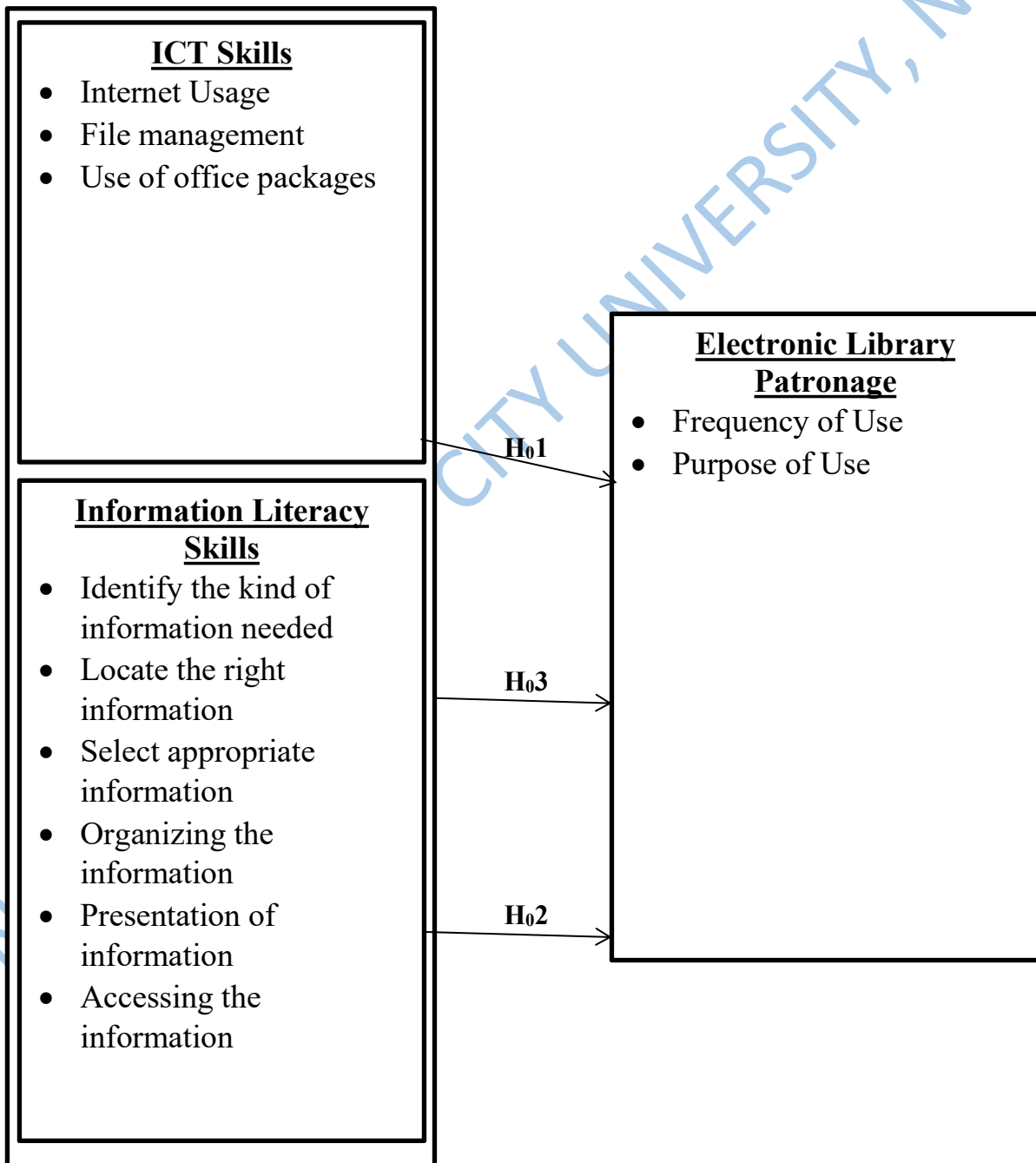
ability to apply ICT to specific purposes. It is not just about using software packages or using operating systems, neither is it concerned only with keyboarding skills and students' ability to copy type or follow instructions. Rather, key skills of ICT are about how students use their knowledge to find, develop and present information, whether it is text, image or numbers, or all of these in an integrated task<sup>109</sup>. Computer usage skills, but also communication, inquiry and information retrieval capabilities<sup>110</sup>. Also, examined undergraduates' computer skills and the use of online information resources: a case study of library and information science students of Delta State University, Nigeria. The study adopted descriptive survey method. Questionnaire was used to collect data for the study, and descriptive statistical method was used to analyze the data collected. The result of the study revealed that 98.5% agreed that Computer skills enhanced their use of online information resources in the electronic library as well as being confidence in using online information resources due to their level of computer skills respectively<sup>111</sup>. Ability to patronize libraries' e-resources efficiently depends on basic information technology skills, knowledge of what is available, how to use it, and ability to define a research problem. How students attain the above skills and knowledge depends on many factors, such as their disciplines, academic status and ranks, age, access<sup>112</sup>. Information technology skills required to maximize the potential of electronic resources are much greater than those required for searching printed sources. These skills include a knowledge of the structure of the database and the instructions which must be input into the computer by the searcher, as well as an understanding of the ways in which the instructions are linked with one another<sup>113</sup>. Use of computer and online information resources is rapidly becoming a key component among university students in many parts of the world. The author noted that the level of information technology skills among the students has been found to influence the use of online information resources in the libraries<sup>114</sup>. Information literacy is essential

for the effective utilization of resources. The study also observed that information literacy instruction gives the idea and increase the effective use of resources<sup>115</sup>. Highlighted that, the use of paraphrasing exercises as add-ons to information literacy instruction for students<sup>116</sup>. Information literacy skills for undergraduate students to assess library resources and instruction method are most effective for improving the information literacy skills of students at an introductory, undergraduate level, using cognitive outcomes<sup>117</sup>. The course of information literacy given by the Chong Quing University Library to cultivate University student's information awareness<sup>118</sup>. One of the ways librarians and library information literacy sessions can have a positive impact on student's lifelong learning, revealed investigation reports of university students from two institutions in the USA and Europe which was carried out in order to determine how they can use their libraries, information and computers was purely on information literacy<sup>119</sup>. IL is more impact on the results of utilization of resources, it's a pride for teaching librarians and attempts to answer questions about how LIS professionals can better assist students to build upon what they already know.

## 2.5 Conceptual Framework

### Independent Variables

### Dependent Variable



**Figure 0.1:** Conceptual Framework on ICT Skills, Information Literacy Skills and Electronic Library Patronage

**Source:** Researcher's Conceptual Framework, 2022

## **2.6 Summary of Literature Reviewed**

This chapter highlights scholars' opinions about the topic of this research which is the influence of ICT Skills and Information Literacy Skills on Electronic Library Patronage by Students in selected Polytechnics in Osun State, Nigeria. The review highlights the value of developing ICT and information literacy skills. ICT skills, information literacy abilities, and use of electronic libraries have all been made clearer by the conceptual framework review. It displays the correlation between the independent variables and the dependent variable (use of electronic libraries) (ICT Skills and Information Literacy Skills).

Consequently, a study of this kind will contribute to determining the present ICT usage trends among library users in Nigerian polytechnic education. Internationally, several studies have been conducted on Internet usage<sup>98</sup>. In a study, survey of internet use, abuse and addiction by 563 users, the respondents reported having problems of managing time for Internet use which interferes with their normal routine works as well as multiple usage related problems of addictive nature<sup>99</sup>. An analysis of the information literacy of engineering students at a Malaysian college revealed that the students had major information literacy deficiencies, particularly in terms of assessing ICT, information, choosing the most effective search technique, and using information ethically<sup>100</sup>. A study on how using ICT improves students' social skills and how it affects their achievement in science. The findings indicated a significant relationship between two facets of social skills and ICT use, indicating that Internet use aids in the development of particular facets of students' social skills and abilities. These findings make it very evident that the ICT is essential to human life<sup>101</sup>. There is a well-documented digital divide between low-income, under-educated persons and those with high incomes and degrees in the United States,

according to studies on the topic. The research looked at four potential explanations for this pattern, including variation in the opportunity cost of leisure time, the value of online activities, the total quantity of leisure time, and the influence of choice<sup>102</sup>. Findings from the study imply that variations in the opportunity cost of leisure time best explain this trend, and they also aid in estimating the likely outcomes of internet-access subsidies. The average performance of polytechnic students who were taught using ICT-based methods was found to be higher than that of students who were taught using traditional methods. When ICT was incorporated into the classroom, not only did students learn more in less time, but they also enjoyed their classes more<sup>103</sup>.

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## **Chapter Three**

### **Research Methodology**

This chapter presents the methodology used for this study. It comprises the research design, population, sample and sampling technique, research instrument, validation of the instrument, reliability of the instrument, administration of the instrument and data analysis procedure.

#### **3.1 Research Design**

This study adopted the cross-sectional survey design as it attempts to study a subset of a population at a point in time and determine the influence of ICT Skills and Information Literacy Skills on Electronic Library Patronage by Students in Selected Polytechnics in Osun State, Nigeria. As an approach, cross-sectional survey design offers the opportunity to collect data at a point in time; it has an economic advantage over the longitudinal survey design as it is less cumbersome. Its usage is premised on prior related literature on ICT Skills, Information Literacy Skills and Electronic Library Patronage.

#### **3.3 Population of the Study**

The population for this study comprises of National Diploma (ND) students of the three Public polytechnics which comprises Osun State Polytechnic, Iree, Federal Polytechnic, Ede and Osun State College of Technology, Esa-Oke, Nigeria. The population is represented as listed in Table

**Table 0.1: Population of the Study**

S/N	Name of Polytechnics	Number of Students
1.	Osun State Polytechnic, Iree	4,325
2.	Federal Polytechnic, Ede	3,223
3.	Osun State College of Technology, Esa – Oke	1,540
	<b>Total</b>	<b>8,788</b>

Source: Osun State Ministry of Education, 2022. Institutional PRO office, 2022

### 3.4 Sample Size and Sampling Technique

The sample size of this study is three hundred and six (306) students of Osun State Polytechnic, Iree, Federal Polytechnic, Ede and Osun State College of Technology, Esa – Oke, Osun State, Nigeria. This sample size was gotten from Krejcie and Morgan<sup>1</sup> sample size table as shown in Table 3.2

**Table 3.2: Table for Determining Sample Size of a Known Population**

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	302
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	<b>1500</b>	<b>306</b>	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Source: Krejcie and Morgan (1970) Sample Size Determination Table

As seen on the table above, the sample size will be two hundred and sixty - nine (306) ND students of the three selected Polytechnics. Stratified sampling method was adopted as the sample technique to arrive at the sample size from the population. The method was adopted because it assists in selecting the most relevant sample size that adequately represents the population and has more related knowledge about the concept being treated in the topics which could be generalized at the end of the research work.

**Table 3.3 Stratified Sampling Calculation for the Sample Used**

S/N	Name Institutions	% of total population	Calculated no for each sample
1.	Osun State Polytechnic, Iree	$\frac{4325}{8788} \times 100 = 47\%$	$\frac{47 \times 306}{100} = 143$
2.	Federal Polytechnic, Ede	$\frac{3223}{8788} \times 100 = 36\%$	$\frac{36 \times 306}{100} = 110$
3.	Osun State College of Technology, Esa-Oke	$\frac{1540}{8788} \times 100 = 17\%$	$\frac{17 \times 306}{100} = 52$
<b>Total</b>			<b>306</b>

### 3.5 Description of Research Instrument

Data collected using a structured questionnaire titled: ICT Skills, Information Literacy Skills and Electronic Library Patronage (ISILSELP). The instrument was a structured questionnaire adapted from previous empirical studies. This study will also adopt the Likert scale design which allowed the researcher provide their opinion about the issue under study. The instrument collected opinion and perception of students from each of the

level and school. This will be done by giving the students the questionnaires to fill with proper monitoring.

**Section A:** This section is self-designed to collect demographic information of respondents. This information contains Bio – data of Respondents measured through four factors; gender, age and class.

**Section B:** This section is designed to collect data on Electronic Library Patronage (ELP). The electronic library patronage measures such frequency of use and purpose of use which were adapted from scholar in different context<sup>2,3</sup> with 8 items. Each of the adapted questionnaires are considered reliable given the reliability test result reported by scholars. Examples of the questions are; I spend less time with the library electronic facilities because the facilities are not updated, Electronic facilities are easily use for research work. The Cronbach's alpha coefficient for the variables are 0.72, 0.6, and 0.76 respectively. The response options available to respondents following the Likert-type scale include Very high = 4, High = 3, Low = 2, Very low = 1.

**Section C:** This section is designed to collect data on ICT Skills. The ICT Skills scale which indicates measures such as ICT Usage, Computer Availability, Use of Internet Technology and Use of Microsoft word and other Packages which were adapted from scholar from different context<sup>4,5</sup> with 12 items. Each of the adapted questionnaires is considered reliable given the reliability test result reported by scholars. Examples of questions are; I use the library ICT facilities to create my own digital learning resources, Provision of computer systems that can serve many students at the same time. The Cronbach's alpha coefficient for the variables are 0.71, 0.79. and 0.76 respectively. The response options available to respondents following the Likert-type scale include Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1.

**Section D:** This section is designed to collect data on Information Literacy Skills. The Information Literacy Skills scale with measure such as defining the kind of information needed,

locating the right information, selection of appropriate information, organizing the information, presentation of information and accessing the information which were adapted from scholar in different context<sup>6,7</sup> with 18 items. Each of the adapted questionnaires is considered reliable given the reliability test result reported by scholars. Examples of questions are; Ability to identify variety of types and formats of resources, Ability to use freely available online research data, like open-access journals. The Cronbach's alpha coefficient for the variables are 0.75, 0.73. and 0.79 respectively. The response options available to respondents following the Likert-type scale include Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1.

### **3.6 Validation of the Research Instrument**

To validate this study, instrument gathered through related literature review and adaptation from questionnaires that have been used by other researchers. Content and construct validity will be done. Content validity will be used to assess the internal validity of the research instruments which will be ascertain through the supervisor and other experts in information management field. Corrections made will be incorporated in constructing the final questionnaire which will be given out to the respondents for the study.

### **3.6 Reliability of the Research Instrument**

The researcher subjected the questionnaire to a reliability test to check the internal consistency of all items measuring each variable in the study. The reliability of the instrument was done through a pilot study using thirty (30) copies of the questionnaire that will be administered to HND 1 students of Business Administration department which is not part of the study. Data obtained was subjected to Cronbach's Alpha reliability test to establish internal consistency of the items. The Cronbach's Alpha yielded a result of 0.86 which was considered better According Tabar, the general rule of thumb is that a

Cronbach's Alpha of .70 and above is good, .80 and above is better, while .90 and above is the best.

### **3.7 Distribution of the Research Instrument**

A primary data were collected to address the objectives of the study through adapted questionnaire in line with literature. This instrument works well with a cross-section survey design mainly because it supports the collection of data regarding opinion and perception of respondents at a point in time on current issues. A letter of introduction was obtained from the Department of Information Management, Lead City University which will be used to gain permission to conduct the survey from the management of the selected Polytechnics in Osun State. Due to number of respondents, five (5) research assistants will be assist in easing the administration, retrieval and initial sorting of copies of the questionnaires. In all, 306 copies of questionnaires will be administered to the students of the selected Polytechnics.

### **3.8 Method of Data Analysis**

The researcher analyzed the data collected using the descriptive and inferential statistic for the items in all the sections in the questionnaires. The use of the descriptive statistics is appropriate because it helps to describe and summarize data in terms of frequency distribution, mean, standard deviation, and percentage of response about variables under study, thereby answering the research questions. To test the hypotheses formulated, the inferential statistics through linear regression analyses will be used mainly to test the hypotheses one and two while multiple regression will be used to test hypothesis three. The data collected for the study will be analyze using Statistical Package for Social

Sciences (SPSS), version 24. All hypotheses in the study will be tested at level of 0.05 significance.

#### Endnotes

1. M. Adamu, B. Agboola, & B.S. Aduku, "Analysis of Library Patronage in Federal University Gashua Library". **Journal of Educational Research and Development**, 13(1), 2018. 7-13,
2. Z. M. Teoh, & A. K. G. Tan, Determinants of library use amongst university students: **Malaysian Journal of Library & Information Science**, 16 (2), 2011: 2013. 21-31.
3. C. Teddies & F.YU. "Mixed methods sampling: A typology with examples of mixed". *Methods Research* (1), 2007; 77- 100.
4. P.C Cozby. *Methods in Behavioural Research* 10<sup>th</sup> Edition New York. MC Graw Hill, 2009.

## Chapter Four

### Data Analysis and Presentation

This chapter gives clear analysis and interpretation of data collected from the field survey on the Influence of ICT skills and information literacy skills on electronic library patronage of students of Public Polytechnics in Osun State. This chapter therefore introduces personal data of respondents which include Gender and Age of the respondents. Data obtained were presented and analyzed using Statistical Package for Social Sciences (SPSS).

#### 4.2 Analysis of Demographic Information of Respondents

**Table 4.1:** Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	159	52.8%
Female	147	47.2%
<b>Total</b>	<b>306</b>	<b>100</b>

**Source:** Researcher's Field Survey, 2022

The table shows that 159(52.8%) of the respondents are male while 142(47.2%) of the respondents are female. The majority of the respondents are male polytechnics students

**Table 4.2:** Age Distribution of Respondents

Age	Frequency	Percentage (%)
20 – 25 years	159	52.8%
26 – 30 years	142	47.2%
<b>Total</b>	<b>301</b>	<b>100</b>

**Source:** Researcher's Field Survey, 2022

#### 4.3 Analysis of Research Questions

**Research Question One: what is the Level of Electronic Library Patronage among Students of Public Polytechnics in Osun State.**

Very Often = 4, Often = 3, Sometimes = 2, Rarely = 1

**Table 4.3: Level of Electronic Library Patronage Among Students of Public Polytechnics in Osun State.**

S/N	How often have you used the following library resources?	VO 4	O 3	S 2	R 1	Mean	Std. Dev.	Remarks
	<b>Frequency of Use</b>							
1	I use Electronic Library to access Electronic Journals	186 61.8%	61 20.3 %	36 12%	18 6%	3.37	.91437	
2	I use Electronic Library to access Electronic Books	199 66.1%	59 19.6 %	31 10.3 %	12 4%	3.48	.83488	
3	I patronize Electronic Library to access Electronic Data base	54 17.9%	62 20.6 %	95 31.6 %	90 29.9 %	3.48	.83488	
4	I patronize Electronic Library for Electronic Thesis	199 66.1%	59 19.6 %	31 10.3 %	12 4%	2.27	1.0751	
5	I use Electronic Library to read Electronic Newspaper	42 14%	51 16.9 %	71 23.6 %	137 45.5 %	1.99	1.0893 2	
6	I use Electronic Library to read Electronic Magazine	42 14%	51 16.9 %	71 23.6 %	137 45.5 %	1.99	1.0893 2	
7	I use Electronic Library to access my mails	31 10.3%	61 20.3 %	69 22.9 %	140 46. 5%	1.94	1.0393	
	<b>Overall Mean</b>	<b>(<math>\bar{x}</math>) = 18.52</b>						
	<b>Grand Mean</b>	<b>(<math>\bar{x}</math>) = 2.65</b>						

**Source: Researcher's Field Survey, 2022**

Decision: it has been adjudged that means score of 2.5 and above is significant.

Table 3 shows that 186(61.8%) of the respondents use electronic library to access electronic journals very often; 61(20.3%) of the respondents often use it, 36(12%) of the

respondents sometimes use it while 18(6%) of the respondents rarely use it. Also, 199(66.1%) of the respondents use electronic library to access electronic books very often; 59(19.6%) of the respondents often use it; 31(10.3%) of the respondents sometimes while 12(4%) of the respondents rarely use it. Furthermore, 54(17.9%) of the respondents patronize electronic library for electronic thesis very often; 62(20.6%) of the respondents often; 95(31.6%) of the respondents sometimes while 90(29.9%) of the respondents rarely patronize the electronic library. It was also revealed that 199(66.1%) of the respondents patronize electronic library to access electronic database very often; 59(19.6%) of the respondents often; 31(10.3%) of the respondents sometimes while 12(4%) of the respondents rarely. More so, 42(14%) of the respondents patronize the electronic library to read electronic newspapers very often; 51(16.9%) of the respondents often; 71(23.6%) of the respondents sometimes while 137(45.5%) of the respondents rarely. In addition, 42(14%) of the respondents use the electronic library to read electronic magazine very often; 51(16.9%) of the respondents often; 71(23.6%) of the respondents sometimes while 137(45.5%) of the respondents rarely. Also, 31(10.3%) of the respondents use electronic library to access mail very often; 61(20.3%) of the respondents often; 69(22.9%) of the respondents sometimes while 140(46.5%) of the respondents rarely.

Table 3 also revealed that 198(65.8%) of the respondents patronize the electronic library for assignments very often; also 199(66.1%) of the respondents very often patronize the electronic library for research purpose. In addition, 131(43.5%) of the respondents patronize the electronic library to search for news and information.

It can therefore be concluded that to do assignments, research purpose, to search for news and information are the purpose of electronic library patronage in Osun state polytechnics while to access electronic journals, electronic books, electronic database are the frequency of electronic library patronage.

**Research Question Two: What is the Level of ICT Skills among Students of Public Polytechnics in Osun State, Nigeria**

**Table 4.4: Level of ICT Skills Among Students of Public Polytechnics in Osun State**  
**Level of ICT Skills among Students of Public Polytechnics**

S/ N	In what way have you engaged in the following?	VO 4	O 3	S 2	R 1	Mea n	Std. Dev.	Remarks
	<b>File Management</b>							
1	I know how to print document	17 5.6%	102 33. 9%	97 32. 2%	85 28. 2%	3.48	.83488	
2	I know how to attach a file to an e-mail message	42 14%	72 23. 9%	93 30. 9	94 31. 2%	2.75	1.0844 5	
3	I know how to convert text files from one extension to another	96 31.9 %	85 28. 2%	68 22. 6%	52 17. 3%	2.21	1.0347 8	
4	I know how to compress and decompress files using relevant software	199 66.1 %	59 19. 6%	31 10. 3%	12 4%	2.17	.90620	
	<b>Use of Office Packages</b>							
5	I know how to use word processor/editor to write texts	93 30.9 %	115 38. 2%	51 16. 9%	42 14 %	2.86	1.0101 8	
6	I know how to edit a text	199 66.1 %	59 19. 6%	31 10. 3%	12 4%	3.48	.83488	
7	I can use spreadsheet such as MS Excel very well	119 39.5 %	87 28. 9%	53 17. 6%	42 14 %	2.94	1.06289	
8	I can use PowerPoint for electronic presentations	101 33.6 %	104 34. 6%	56 18. 6%	40 13. 3%	2.88	.05887	

Internet Usage								
9	I know how to use search engines on the internet	16 5.3%	58 19.3%	98 32.6%	129 42.9%	2.97	1.00278	
10	I know how to download materials from the internet	96 31.9%	91 30.2%	74 24.6%	40 13.3%	2.81	1.03090	
11	I know how to chat on the internet through text, video and sound.	112 37.2%	101 33.6%	54 17.9%	30 11.3%	2.85	.97343	
12	I know how to use internet to fetch Data	94 31.2%	97 32.2%	81 26.9%	29 9.6%	1.87	.90544	
<b>Overall Mean</b>		<b>(<math>\bar{x}</math>) = 33.27</b>						
<b>Grand Mean</b>		<b>(<math>\bar{x}</math>) = 2.77</b>						

Adapted from (shastri and chidasma, 2022; Torres etal... 2013)

Source: Field Survey, 2022

Decision: it has been adjudged that means score of 2.5 and above is significant.

Table 4 revealed that 17(5.6%) of the respondents strongly agreed to know how to compress and decompress files using relevant software; 102(33.9%) of the respondents agreed; 97(32.2%) of the respondents disagreed while 85(28.2%) of the respondents strongly disagreed. More so, 42(14%) of the respondents strongly agreed to know how to convert text files from one extension to another; 72(23.9%) of the respondents agreed; 93(30.9%) of the respondents disagreed while 94(31.2%) of the respondents strongly disagreed. In addition, 96(31.9%) of the respondents strongly agreed to know how to attach a file to an e-mail message; 85(28.2%) of the respondents agreed; 68(22.6%) of the respondents disagreed while 52(17.3%) of the respondents strongly disagreed. Also, 199(66.1%) of the respondents strongly agreed to know how to print documents;

59(19.6%) of the respondents agreed; 31(10.3%) of the respondents disagreed while 12(4%) of the respondents strongly disagreed.

Table 4 also revealed that 93(30.9%) of the respondents strongly agreed to know how to use word processor/editor to write texts; 115(38.2%) of the respondents agreed; 51(16.9%) of the respondents disagreed while 42(14%) of the respondents strongly disagreed. Also, 199(66.1%) of the respondents strongly agreed to know how to edit a text; 59(19.6%) of the respondents agreed; 31(10.3%) of the respondents disagreed while 12(4%) of the respondents strongly disagreed. In addition, 119(39.5%) of the respondents strongly agreed to use spreadsheet such as MS excel very well; 87(28.9%) of the respondents agreed, 53(17.6%) of the respondents disagreed while 42(14%) of the respondents strongly disagreed. More so, 101(33.6%) of the respondents strongly agreed to use PowerPoint for electronic presentations; 104(34.6%) of the respondents agreed; 56(18.6%) of the respondents disagreed while 40(13.3%) of the respondents strongly disagreed.

Table 4 also revealed that 16(5.3%) of the respondents strongly agreed to know how to use internet to fetch data, 58(19.3%) of the respondents agreed; 98(32.6%) of the respondents disagreed while 129(42.9%) of the respondents strongly disagreed. Also, 96(31.9%) of the respondents strongly agreed know how to download materials from the internet; 91(30.2%) of the respondents agreed; 74(24.6%) of the respondents disagreed while 40(13.3%) of the respondents strongly disagreed. More so, 112(37.2%) of the respondents strongly agreed to know how to use search engines on the internet; 101(33.6%) of the respondents agreed; 54(17.9%) of the respondents disagreed while 30(11.3%) of the respondents strongly disagreed. Lastly, 94(31.2%) of the respondents strongly agreed to know how to chat on the internet through text, video and sound; 97(32.2%) of the respondents agreed; 81(26.9%) of the respondents disagreed while 29(9.6%) of the respondents strongly disagreed.

It can therefore be concluded that file management (printing document and attach a file to an email message), use of office packages such as (word processor/editor, MS excel, PowerPoint) and internet usage (downloading materials from the internet, using search engines on the internet, chatting on the internet via text, video and sound) are the level of ICT skills among students of Public Polytechnics in Osun State.

**Research Question Three: what are the different Information Literacy Skills among Students of Public Polytechnics in Osun State, Nigeria.**

**Table 4.5: Information Literacy Skills Among Students of Public Polytechnics in Osun State**

S/ N	Please Indicate your Level of Agreement with the Following	VO 4	O 3	S 2	R 1	Mea n	Std. Dev.	Remarks
	<b>Task Definition</b>							
1	I determine information related to learning resources on my own	85 28.2 %	10 3 34. 2%	72 23. 9%	41 13. 6%	2.77	1.00860	
2	I discuss with friends about learning resource information	102 33.9 %	12 5 41. 5%	63 20. 9%	11 3.7 %	3.05	.83275	
3	I discuss with the library staff about learning resource information	48 15.9 %	68 22. 6%	88 29. 2%	97 32. 2%	2.22	1.06784	
	<b>Information Seeking Strategies</b>							
1	I use keywords in finding information	159 52.8 %	12 4 41. 2%	18 6%	-	3.47	.60814	
2	I read printed books as learning resource	96 31.9 %	91 30. 2%	74 24. 6%	40 13. 3%	2.80	1.03090	

3	I read e-books over the internet	199 66.1 %	59 19. 6%	31 10. 3%	12 4%	3.48	.83488	
<b>Location and Access</b>								
1	I search for information in the library	186 61.8 %	61 20. 3%	36 12 %	18 6%	3.38	.91437	
2	I search for information via the internet	112 37.2 %	10 1 33. 6%	64 21. 3%	20 8%	3.00	.95219	
3	I use other sources in searching for information	96 31.9 %	85 28. 2%	68 22. 6%	52 17. 3%	2.75	1.08445	
<b>Use of Information</b>								
1	I read information in whatever form (charts, diagrams, articles etc.)	77 25.6 %	12 8 42. 5%	64 21. 3 %	32 10. 6%	2.83	.93159	
2	I'm critical in filtering information	101 33.6 %	10 4 34. 6%	56 18. 6 %	40 13. 3%	2.88	1.02132	
3	I compare information before deciding on what to use	96 31.9 %	91 30. 2%	74 24. 6 %	40 13. 3%	2.80	1.03090	
<b>Synthesis:</b>								
1	I logically organize information	37 12.3 %	94 31. 2%	97 32. 2 %	73 24. 3%	2.31	.97471	
2	I make conclusions in my own	65	87	83	66	2.5	1.06027	

	words	21.6 %	28. 9%	27. 6 %	21. 9%			
3	I edit information to be presented	47 15.6 %	78 25. 9%	93 30. 9 %	83 27. 6%	2.29	1.03712	
	<b>Evaluation</b>							
1	I actively search for information	117 38.9 %	10 2 33. 9%	68 22. 6 %	14 4.7 %	3.07	.89356	
2	I know how to use information facilities well	89 29.6 %	11 2 37. 2%	73 24. 3 %	27 9.0 %	2.87	.94022	
3	I find information search difficult	99 32.9 %	12 2 40. 5%	52 17. 3 %	28 9.3 %	2.97	.93583	
	<b>Overall Mean</b>	<b>(<math>\bar{x}</math>) = 51.44</b>						
	<b>Grand Mean</b>	<b>(<math>\bar{x}</math>) = 2.86</b>						

**Source: Researchers' Field Survey, 2022**

Decision: it has been adjudged that means score of 2.5 and above is significant.

Table 5 revealed that 85(28.2%) of the respondents strongly agreed to determine information related to learning resources on their own, 103(34.2%) of the respondents agreed; 72(23.9%) of the respondents disagreed while 41(13.6%) of the respondents strongly disagreed. More so, 102(33.9%) of the respondents strongly agreed to discuss with friends about learning resource information; 125(41.5%) of the respondents agreed; 63(20.9%) of the respondents disagreed while 11(3.7%) of the respondents strongly disagreed. Also, 48(15.9%) of the respondents strongly agreed to discuss with the library

staff about learning resource definition; 68(22.6%) of the respondents agreed; 88(29.2%) of the respondents disagreed while 97(32.2%) of the respondents disagreed.

Table 5 also revealed that 159(52.8%) of the respondents strongly agreed to use keywords in finding information; 124(41.2%) of the respondents agreed while 18(6%) of the respondents disagreed. In addition, 96(31.9%) of the respondents strongly agreed to read printed books as learning resource; 91(30.2%) of the respondents agreed; 74(24.6%) of the respondents disagreed while 40(13.3%) of the respondents strongly disagreed. More so 199(66.1%) of the respondents strongly agreed to read e-books over the internet; 59(19.6%) of the respondents agreed; 31(10.3%) of the respondents disagreed while 12(4%) of the respondents strongly disagreed.

Table 5 showed that 186(61.8%) of the respondents strongly agreed that can search for information in the library; 61(20.3%) of the respondents agreed; 36(12%) of the respondents disagreed while 18(6%) of the respondents strongly disagreed. More so, 112(37.2%) of the respondents strongly agreed to search for information via the internet; 101(33.6%) of the respondents agreed; 64(21.3%) of the respondents disagreed while 20(8%) of the respondents strongly disagreed. In addition, 96(31.9%) of the respondents strongly agreed to use other sources in search for information; 85(28.2%) of the respondents agreed; 68(22.6%) of the respondents disagreed while 52(17.3%) of the respondents strongly disagreed.

Table 5 showed that 77(25.6%) of the respondents strongly agreed to read information in whatever form (charts, diagrams, articles etc); 128(42.5%) of the respondents agreed; 64(21.3%) of the respondents disagreed while 32(10.6%) of the respondents strongly disagreed. Also, 101(33.6%) of the respondents strongly agreed to be critical in filtering information; 104(34.6%) of the respondents agreed; 56(18.6%) of the respondents disagreed while 40(13.3%) of the respondents strongly disagreed. Also, 96(31.9%) of the

respondents strongly agreed to compare information before deciding on what to use; 91(30.2%) of the respondents agreed; 74(24.6%) of the respondents disagreed while 40(13.3%) of the respondents strongly disagreed. It can therefore be concluded that the information literacy skills of students of public polytechnics in Osun State is high.

#### 4.4 Testing of Hypotheses

**H0<sub>1</sub>:** There is no significant relationship between ICT skills and electronic library patronage by students in selected polytechnics in Osun State

**Table4. 6: Regression Analysis**

Coefficients					
R= .302 <sup>a</sup> ; R Square = .091 Adjusted R Square = .078					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.103	.103		12.153	.000
ICT Skills	.348	.389	.744	3.381	.004
Electronic Library Patronage	.151	.473	.861	1.453	.039

Dependent Variable: Electronic Library Patronage

**Source: Researchers' Field Survey, 2022**

The table presents the relationship between ICT skill and electronic library patronage of public students polytechnic in Osun State. The table shows that the independent variables (ICT skills) made a significant contribution to patronage of electronic library. In term of magnitude of contribution, ICT skills made the most significant contribution ( $\beta = .348$ ;  $t = 3.381$ ;  $p < 0.04$ ) to ICT skills, followed by Electronic library patronage ( $\beta = -.151$ ;  $t = 1.453$ ;  $p < 0.39$ ).

Since all the probability values are less than the 0.05 level of significance, this shows that there is significant relationship between ICT skills and electronic library patronage among the students. This implies the independent variable (ICT skills) is strong enough to predict electronic library patronage by student in Public Polytechnic in Osun State.

**H0<sub>2</sub>:** There is no significant relationship between information literacy skills and electronic library patronage by students in selected polytechnics in Osun State

**Table 4.7: Regression Analysis**

Coefficients					
R= .302 <sup>a</sup> ; R Square = .091 Adjusted R Square = .078					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.103	.103		12.153	.000
Information Literacy Skills	.876	.422	.752	3.381	.004
Electronic Library Patronage	.927	.387	.861	1.453	.001

Dependent Variable: Electronic Library Patronage

Source: Researchers' Field Survey, 2022

**H0<sub>3</sub>:** There is no combined influence of ICT skills and information literacy skills on electronic library patronage by students in public polytechnics in Osun State, Nigeria

**Table 8: Regression Analysis**

Coefficients					
R= .301 <sup>a</sup> ; R Square = .091 Adjusted R Square = .078					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.103	.103		12.153	.000
ICT Skills	.348	.389	.744	3.381	.004
Information Literacy Skills	.876	.422	.752	3.381	.004
Electronic Library Patronage	.151	.473	.861	1.453	.039

Dependent Variable: Electronic Library Patronage

Source: Researchers' Field Survey, 2022

The table presents the relationship between ICT skill, Information Literacy Skills and electronic library patronage of public students polytechnic in Osun State. The table shows

that the independent variables (ICT skills and Information Literacy Skills) made a significant contribution to patronage of electronic library. In term of magnitude of contribution, ICT skills made the most significant contribution ( $\beta = .348$ ;  $t = 3.381$ ;  $p < 0.04$ ), while Information literacy skills is ( $\beta = .876$ ;  $t = 3.381$ ;  $p < 0.04$ ) followed by Electronic library patronage ( $\beta = -.151$ ;  $t = 1.453$ ;  $p < 0.39$ ).

Since all the probability values are less than the 0.05 level of significance, this shows that there is significant relationship between ICT skills, Information literacy skills and electronic library patronage among the students. This implies the independent variable (ICT skills and Information literacy skills) is strong enough to predict electronic library patronage by student in Public Polytechnic in Osun State.

The table presents the relationship between ICT skill and electronic library patronage of public student's polytechnic in Osun State. The table shows that the independent variables (ICT skills) made a significant contribution to patronage of electronic library. In term of magnitude of contribution, information literacy skills made the most significant contribution ( $\beta = .876$ ;  $t = 3.381$ ;  $p < 0.04$ ) to electronic library patronage, ( $\beta = -.151$ ;  $t = 1.453$ ;  $p < 0.39$ ).

Since all the probability values are less than the 0.05 level of significance, this shows that there is significant relationship between information literacy skills and electronic library patronage among the students. This implies the independent variable (information literacy skills) is strong enough to predict electronic library patronage by student in Public Polytechnic in Osun State.

#### **4.5 Discussion of Findings**

The study investigates the Influence of ICT skills and information literacy skills on electronic library patronage of students of Public Polytechnics in Osun State. Sequel to the data gathered from the field of study; it was discovered that to do assignments, research purpose, to search for news and information are the purpose of electronic library patronage in Osun state polytechnics while to access electronic journals, electronic books, electronic

database are the frequency of electronic library patronage. This in line with the findings that a high number of undergraduates possessed ICT skills such as startup/logon/shutdown computer systems, downloading information resources from databases, bookmarking web addresses, and easily finding information using the world wide web". A study carried out "stressed the elements that influence undergraduate students' use of the university library's OPAC and revealed that the major factors include: getting quick access to library collections is a part of using library software, and using library software is a part of using library software to access information resources in the library, the library software user interface allows for easy retrieval of information materials, time-saving of library software usage, and possession of the library's software's ability to be used". In a study the researchers stated that undergraduate students possess adequate ICT skills and can efficiently make use of the internet. This is because, most of the students believed that using ICT ease their learning. Perhaps this is because everything is now at their fingertips courtesy of ICT. A study on how ICT usage increases students' social skills and its effects on their scientific success. The results showed a strong correlation between two aspects of social skills and ICT usage, that is, Internet usage helps the growth of special aspect of social skills and abilities of students. It is clear from these studies that the ICT plays a key role in human life. Computer usage skills, but also communication, inquiry and information retrieval capabilities. Also, examined undergraduates' computer skills and the use of online information resources: a case study of library and information science students of Delta State University, Nigeria. The study adopted descriptive survey method. Questionnaire was used to collect data for the study, and descriptive statistical method was used to analyze the data collected. The result of the study revealed that 98.5% agreed that Computer skills enhanced their use of online information resources in the electronic library as well as being confidence in using online information resources due to their level

of computer skills respectively. Ability to patronize libraries' e-resources efficiently depends on basic information technology skills, knowledge of what is available, how to use it, and ability to define a research problem. How students attain the above skills and knowledge depends on many factors, such as their disciplines, academic status and ranks, age, access.

Findings of this study also revealed that file management (printing document and attach a file to an email message), use of office packages such as (word processor/editor, MS excel, PowerPoint) and internet usage (downloading materials from the internet, using search engines on the internet, chatting on the internet via text, video and sound) are the level of ICT skills among students of Public Polytechnics in Osun State. This in line with this findings electronic information resource include World Wide Web; WIFI; search engines; online indexes; video CDs VSAT based Internet connectivity; online Library catalogue; online databases; portals; E-journals and E-books". They further enlisted "specific types of electronic information resources as consisting of electronic books (e-books), electronic journals (e-journal), and indexes, collections of journal articles, reference works, digital collections and databases". A researcher opined that "undergraduate students' library patronage in universities is heavily influenced by their information technology skills". They further stated that "the vast majority of those surveyed had basic computer skills like the use of mouse right-click menu function, how to save, print, and preview document, and possesses information technology skills such as searching online databases and use of OPAC to search for information sources amongst others". A study was carried in Nigeria "to determine computer self-efficacy as a predictor of ease of use in students' routine library operations". The findings of "this study reveal that a majority of the respondents were self-efficacious with regard to computer skills, and that there was a significant positive relationship between computer related self-efficacy and the use of computer-

based libraries by students”. The students also learned more in less time and liked their classes more when ICT-based instruction was included.

The ICT skills that have become increasingly important in the pursuance of a degree-level education will affect both how students manipulate these e-learning resources and the way they are used for learning. ICT skills deal with the application of ICT to specific purposes. It is not just about using software package or using operating systems, neither is it concerned only with keyboarding skills and students’ ability to copy-type or follow instructions. Rather, ICT skills among undergraduates is about students’ ability to use their knowledge about ICT to find, develop and present information; whether it is text, image, or number, or all of these in an integrated task.

Finally, the findings of this study also revealed that the information literacy skill of students of public polytechnics in Osun State is high. This is in accordance with, it was observed that the students were more involved in the adoption of technologies; therefore web-based instructions could be used for inculcating information literacy skills among the students. The purpose of the academic libraries is to support teaching, learning and research activities which are only possible by providing access to the required information and related resources. Therefore, study further emphasized the vital role of academic libraries in the students learning and performance in their studies. In recent years, “research regarding information literacy skills has attracted the attention of Pakistani academics, practitioners, and researchers”. The study investigation of information literacy skills of second year undergraduate medical radiation students at RMIT polytechnic in Australia revealed that the students demonstrated high improvement in online electronic information skills development ability and continued use of databases to access scholarly information in their discipline. A Study focused on information literacy skills of students of Guru Nanak Dev University, Amritsar, discusses the concept of information literacy

and the role of college librarians in developing information literacy skills in libraries. The study provides that, information literacy competency of science, engineering and technology students of higher education institutions in Delhi has badly required information literacy for better use of available resources.

This study as mentioned that, information literacy integrating ICT and computer skills, which enables users to access right resources, and which will enhance the capability of users to do research in Agricultural Universities. The study advocated that effective implementation of information literacy programmes is possible with efficient models of information literacy. The study have assessed university students attitudes and self-assessment regarding information literacy skills. The studies have examined effectiveness of information literacy programs and the student research skills at five private universities in Nigeria. The study have assessed the information literacy skills of arts faculty graduate students at the University of Dhaka, Bangladesh and also focused on online survey of 534 students at a technology-focused University in Singapore assess their information literacy skills. Highlighted that, the information literacy as the skill and knowledge that allow us to find, evaluate and use the information. Information skills are the necessary tools that help us successfully navigate the present and future landscape of information. The study has stated that, the information skills and information literacy are one and same, the study described the work of the SCONUL task force on information skills, set up as a result of the increased awareness on information skill training which was an important strategic issue for university and polytechnic. The study has mentioned that, the information skills in terms of the development of information literacy and the skills needed to use information purposefully and effectively are very crucial.

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## Chapter Five

### Conclusion

This chapter presents the summary, conclusion and recommendations obtained in the course of this study.

#### 5.1 Summary of Findings

The research is summarized as follows:

1. Findings from this research work shows that to do assignments, research purpose, to search for news and information are the purpose of electronic library patronage in Osun state polytechnics while to access electronic journals, electronic books, electronic database are the frequency of electronic library patronage.
2. Findings from this research also revealed that file management (printing document and attach a file to an email message), use of office packages such as (word processor/editor, MS excel, PowerPoint) and internet usage (downloading materials from the internet, using search engines on the internet, chatting on the internet via text, video and sound) are the level of ICT skills among students of Public Polytechnics in Osun State.
3. Finally, the findings of this study revealed that the information literacy skills of students of public polytechnics in Osun State is high.
4. The findings of the study also revealed that the level of electronic library patronage in public Polytechnics in Osun State is increasing due to the improved level of their information Literacy Skills.
5. The findings show that there is relationship between the level of ICT Skills and Electronic Library Patronage by students of Public Polytechnics in Osun State

6. The findings of this thesis also revealed that there is a combined relationship and influence between the ICT Skills and Information Literacy Skills on Electronic Library Patronage by Students of Public polytechnics in Osun State.

## **5.2 Conclusion**

Electronic libraries have assumed a fundamental role in our information delivery activities in the society by way of making electronic information resources available in libraries, archives and any knowledge repository worldwide. An electronic library is a library which provides primary and secondary information electronically through communications networks and the basis for this purpose. It is potentially an organization that expansively acquires, manages and preserves digital contents for easy access to the needed information by the targeted community in their areas of specialization according to comprehensive codified policies. It offers the potential to greatly improve on how individuals search and retrieve information from available databases.

E-library resources hold many advantages such as time and place convenience, timeliness, ability to search directly on text (as against the catalogue records), ability to link to further reading material and ability to disseminate and share information. E-library is a computerized system for acquiring, storing, organizing, searching and distributing electronic materials, it may not necessarily be network - based; rather it could be designed to be capable of being attached to a network. However, e-library resources pose human, social and technological problems, such as discomfort in reading on the screen, problems in internet access and speed, poor infrastructure, lack of sufficient skills to use the digital resources, and perceptual change resulting from right to use rather than physical possession. The use of electronic information resources in learning and research by

polytechnic students has become indispensable in this digital age where globalization of education is made possible through Information and Communication Technology (ICT).

ICT literacy has helped students' master content faster, better problem-solvers, become more self-directed, and assume greater control over learning. Beyond the classroom, ICT literacy is essential for being productive citizens in a knowledge-driven society, and employers want their employees to have these skills. As a result, college and university administrators are beginning to require them as competencies for graduation. This focus has led to campus wide initiative to improve students' ICT literacy skills. However, there are still several still challenges to affecting the improvement in the ICT literacy skills of the students. ICT literacy students explore a wide variety of topics, including how people find, use, summarize, evaluate, create, and communicate information while using digital technologies.

Information literacy is much more than computer literacy, although having basic computer skills is an aspect of information literacy skills. The information literacy encompasses library literacy, computer literacy, publishing literacy, and tool literacy. Information literacy is the capability to identify needed information, understand organization of information, identify appropriate information sources, locate these sources, critically evaluate the sources, and disseminate such information<sup>21</sup>. Other authors also think that information literacy goes beyond locating and using information but includes holistic knowledge of information and information evaluation.

### **5.3 Recommendations**

Based on the findings and conclusion of this study, the following recommendations were made:

1. The library management should provide more ICT facilities such as Computers, Internet Services etc.
2. More Printers must be provided to the Electronic section of the library
3. Students surveyed need to possess adequate search skills in using online in order to function maximally in an IT environment.
4. The library should organize more training and seminars for the students on the use of electronic library in Public Polytechnics
5. The Lecturers should take it as a matter of importance by engaging the students with more practical assignments that requires the use of electronic libraries
6. The curriculum for polytechnic students should also be redesigned to accommodate the use of modern ICT facilities

#### **5.4 Contribution to knowledge**

The study will contribute to knowledge by revealing that ICT skills, information literacy skills and electronic library are *sin qua non* to students' patronage of library.

The findings of this study may be useful to education stakeholders (university administration, librarians, researchers, students, academic and non-academic staff), such that they see reason to equip library with e-resources and subscribe to different relevant databases, and to equally regularly organize training that will equip library clientele with needed ICT skills to fully explore the e-library resources.

Empirically, the study has collected raw data that was previously not in existence. This data is available for future researchers, who might find any aspect useful either for comparison or adaptation.

### **5.5 Suggestions for further Study**

This study only to cover the public polytechnic in Osun State. Therefore, it is suggested that:

1. A comparative study of both public and private polytechnics in the State be conducted. This will provide more understandings of the efficacy of e-library and ICT skills in improving users' library patronage.
2. A study on the influence of Electronic Library Patronage on the Academic Performance of students in Public polytechnics
3. A study on the impact of Information Literacy Skills on the online information retrieval by students in Public Polytechnics.