

**INFORMATION DISSEMINATION, CURRENT AWARENESS SERVICES
AND ONLINE DATABASES IN LIBRARIES AS FACILITATORS OF
UNDERGRADUATE ENGINEERING STUDENTS' SKILLS ACQUISITION IN
NORTH CENTRAL, NIGERIA**

BY

**JONATHAN, Pwambodi Juliet
MTech/SICT/2018/8120**

**DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE
FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA**

JULY, 2023

**INFORMATION DISSEMINATION, CURRENT AWARENESS SERVICES
AND ONLINE DATABASES IN LIBRARIES AS FACILITATORS OF
UNDERGRADUATE ENGINEERING STUDENTS' SKILLS ACQUISITION IN
NORTH CENTRAL, NIGERIA**

BY

**JONATHAN, Pwambodi Juliet
MTech/SICT/2018/8120**

**A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL, FEDERAL
UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE
DEGREE OF MASTER OF TECHNOLOGY IN LIBRARY AND
INFORMATION TECHNOLOGY**

JULY, 2023

ABSTRACT

The study examined Information Dissemination, Current Awareness Services (CAS) and online Database as Facilitators of Undergraduate Engineering Students' Skills Acquisition in Federal Universities in North Central, Nigeria. The study was guided by 10 objectives and 10 corresponding research questions. The objectives of the study were to: find out the available online databases in the libraries in federal universities in North Central, Nigeria, find out the level of skills acquisition gathered by undergraduate Engineering students from Current Awareness Services, online databases and information dissemination in federal universities in North Central, Nigeria, ascertain the methods used for information dissemination, current awareness services and online databases in libraries for skills acquisition, determine the relationship between information dissemination and skills acquisition in libraries of Federal Universities in North Central, Nigeria, find out the relationship between Current Awareness Services and undergraduate Engineering students' skills acquisition in libraries of federal universities in North Central, Nigeria, determine the relationship between online databases and undergraduate Engineering students skill acquisition in libraries of federal universities in North Central, Nigeria, find out the factors militating against skill acquisition of undergraduate Engineering students in libraries of federal universities in North Central, Nigeria, find out if there is no significant relationship between the available current awareness services and skill acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria, to find out if there is no significant relationship between information dissemination and skill acquisition of undergraduate Engineering students in federal universities in North Central. Nigeria and find out if there is no significant relationship between online databases and skill acquisition of undergraduate Engineering students in federal universities in North Central. Nigeria. The total population of undergraduate Engineering students studied was nine thousand, eight hundred (9,800). From this population, a sample size of three hundred and seventy (370) was derived using Krejcie and Morgan tables for determining sample size. Questionnaire and observation checklist were used as instruments of data collection Out of the 370 copies of questionnaires distributed. 311 were filled, returned and used for the analysis. The study revealed that the libraries studied subscribe to Ebsco-host, Dinary, Science Direct and AJOL. The study revealed a mean value of 2.91, 2.87, 2.71, 2.69, 3.06 and 2.63 as mean values, indicating that information dissemination has a high impact on skills acquisition. The study equally revealed mean values of 2.88, 2.67, 2.92, 2.57 and 2.92 indicating that online databases have great impact on skills acquisition. The study recommended among others that the library management should boost their methods of CAS. information dissemination and online databases services. The study also recommended that the library management should acquire more relevant databases and keep their subscriptions up to date to boost the skills acquisition of undergraduate Engineering students.

TABLE OF CONTENTS

Content	Page
Cover Page	
Title Page	i
Declaration	ii
Certification	iii
Dedication	iv
Acknowledgements	v
Abstract	vi
Table of Contents	vii
List of Tables	ix
List of Figure	x
CHAPTER ONE	
1.0. INTRODUCTION	1
1.1 Background to the Study	1
1.2 Statement of the Research Problem	9
1.3 Aims Objectives of the Study	10
1.4 Research Questions	11
1.5 Research Hypotheses	12
1.6 Significance of the Study	13
1.7 Scope of the Study	14
1.8 Operational Definition of Terms	14
CHAPTER TWO	
2.0 LITERATURE REVIEW	16

2.1	Conceptual Framework	16
2.1.1	Information Dissemination Vis-à-vis Skill Acquisition of Undergraduate Engineering Students	17
2.1.2	Current Awareness Service Vis-a-vis Skills Acquisition of Undergraduate Engineering Students	23
2.1.3	Online Databases vis-a-vis Skills Acquisition of Undergraduate Engineering Students	30
2.1.4	Historical Overview of Online Databases	33
2.1.5	Types of Online Databases	40
2.1.6	Engineering Skill Acquisition	59
2.2	Theoretical Framework	62
2.2.1	Social Learning Theory (SLT)	62
2.3	Empirical Studies	67
2.4	Summary of Literature Reviewed	75
 CHAPTER THREE		
3.0	RESEARCH METHODOLOGY	77
3.1	Research Design	77
3.2	Population of the Study	77
3.3	Sample and Sampling Technique	79
3.4	Instrument for Data Collection	80
3.5	Validity of Research Instrument	81
3.6	Reliability of Research Instrument	81
3.7	Procedure for Data Collection	81
3.8	Method of Data Analysis	82
 CHAPTER FOUR		
4.0	RESULTS AND DISCUSSION	83

4.1	Response Rate	83
4.2	Demographic Distribution of Respondents	84
4.3	Hypotheses Testing	127
4.4	Summary of the Findings	129
4.5	Discussion of the Findings	131
 CHAPTER FIVE		
5.0	CONCLUSION AND RECOMMENDATIONS	137
5.1	Conclusions	137
5.2	Recommendations	137
5.3	Contribution to Knowledge	140
5.4	Suggestions for Further Study	140
	REFERENCES	141
	APPENDICES	148

LIST OF TABLES

Table	Page
3.1 Population of the Study	78
3.2 Sample Size of the Study	78
4.1 Response Rate	83
4.2.1 Distribution of Respondents According to Gender	84
4.2.2 Distribution of Respondents by Level of Study	84
4.2.3 Distribution of Respondents by Department	85
4.3 Available Databases in the Institutions Studied	86
4.4 Level of Skills Acquisition	87
4.5 Methods used for Information Dissemination	113
4.5.1 Methods used for Current Awareness Services	114
4.5 Relationship between Information Dissemination and Skills Acquisition	120
4.7 Relationship between CAS and skills acquisition	122
4.9 Factors militating against skills acquisition	127
4.10 Relationship between the available current awareness services and skill acquisition of undergraduate students of Engineering in federal universities in North Central. Nigeria	129
4.11 Relationship between Information Dissemination and skills acquisition of undergraduate students of Engineering in Federal Universities in North Central, Nigeria	130
4.12 Relationship between Online Databases and Skills Acquisition of Undergraduate Students of Engineering in Federal Universities in North Central. Nigeria	131

CHAPTER ONE
LIST OF FIGURES

Figure	Page	1.0
2.1	16	INTRODUCTION
2.2	66	1.1 Background to the Study

Skills could be defined as single units or combinations of units which link to a license or regulatory requirement, or defined industry need' (National Quality Council, 2006). Efforts have been made around the globe to analyze the skills sets of engineering professionals. Modern engineers are expected to play more complex roles than the traditionally technical roles attributed to engineers. For example, modern engineers should be able to function as businessmen, to communicate effectively, and to possess social and environmental awareness. A successful and effective engineer in the modern workplace should possess a reasonably balanced set of both technical skills and professional skills. Engineering curricula must be able to keep up with the evolving requirements of modern Engineering professionals in order to produce successful graduates. Recent research has attempted to describe the importance of the various components of Engineering graduates' skills sets in the workplace (Aleksandrov *et al.*, 2014). Studies have also highlighted the growing demands of employers for highly skills graduates and the role that these employers can play in effecting positive change in Engineering education. Alpay and Jones (2012) revealed that undergraduates needed to be better-equipped with professional skills sets in areas such as business knowledge and lifelong learning abilities. Moreover, it was suggested that employers actively increase their involvement in and their support of engineering education (Alpay & Jones 2012).

Laker and Powell (2011) defined professional skills as the ability to manage oneself and the ability to interact effectively with other individuals, as intrapersonal skills. This was contrasted with technical skills. It was posited furthermore, that professional skills were a necessary component of any employee's skills set and comprised an integral part of an employee's training process (Laker & Powell 2011). Engineering students are those students that need skills in order to enable them participate in the technology build up of the society, learn new and better ways of carrying out Engineering-related tasks, come up with ground-breaking ideas and invention and to enable them be productive. Therefore, for undergraduate Engineering students to be able to acquire pertinent skills there should be a requisite means through which information is disseminated to the students by the library.

A library is the centralised place where latest and developing information technologies can be joined with learning resources in a client centered, administration rich environment that backs today's social and technological examples of knowledge, education and study. There are different types of libraries: Public Libraries, School Libraries, National Libraries, Special Libraries and Academic Libraries. Academic libraries are central in every academic institution and play supporting roles such as information creation, information processing, information storage and information dissemination. Libraries also deploy services such as Current Awareness Services, Information Dissemination, provision of online databases and so on, all targeted towards satisfying the information needs of their users.

Information dissemination is the communication of available information resources and services to library users such as students of Engineering that are geared towards facilitating skills acquisition. The efficiency and effectiveness of information dissemination in libraries, and access by users will help to support skills acquisition by

undergraduates of Engineering (Anyira, 2011). This will also help to raise informed and educated citizens. Information dissemination is a proactive information service designed

to educate and inform focused groups of users on society, economies and educational issues of education and learning programmes. Therefore, library and information resources should be organised in a way that they can be accessed and retrieved in a timely manner. Information dissemination requires systematic collection, organisation and storage of information relevant to the needs of the user community. Thus, librarians must ensure that library services such as information dissemination, Current Awareness Services and Online Databases are generated using indexed resources through data-based library catalogue, repositories, digital libraries, web resources etc. There should also be consistency and uniformity in description of these materials for easy information dissemination.

Put differently, the birth of technology and continuous Information and Communication Technology (ICT) developments are changing libraries in terms of information acquisition, storage, organisation, maintenance and the methods of rendering services or disseminating information (Fagbola *et al.*, 2011). Some of the methods used in the library to disseminate information in the 21st century era. Most of these methods are self-service techniques which involve the use of technology such as Laptops, Smartphones, PDAs, MP3s, computers and many more.

Online Public Access Catalogues (OPACs) and networked databases are techniques used by libraries in disseminating information. Current OPACs can be accessed through the use of mobile technology such as cell phones. Undergraduate Engineering students no longer need to be within the library walls for them to access OPACS and library databases, as Information Seekers retrieve various information sources through mobile Online Public Access Catalogues and mobile based databases.

Personal space/My Library is another self-service platform where library users manage their personalised accounts with custom-made collections. Here users can set up and manage their profile, preferences for catalogue searches, receive alerts on reserved items, check their records, track interlibrary loan requests, renew borrowed items and document delivery requests (Saxena & Yadav, 2013; Verma & Verma, 2014). This platform presents a new opportunity for electronic data interchange and selective information dissemination (Liu and Briggs, 2015). Information providers are able to send customised scanned documents, images, audio books and E-books to library users' personalised accounts (Saxena & Yadav, 2013). This library service is also a good platform for e-learning and / distance learning (Prabhakaran & Kalyani, 2014). Academic libraries can harness the advantages of mobile technology to implement structures for enhancing skills acquisition of undergraduate Engineering students irrespective of their location (Nalluri & Gaddam, 2016). Personalised user accounts and library collections help the users to feel in control of their information resources and increase more interest in accessing library resources.

Short Message Service (SMS) notification is another method of information dissemination in the library using mobile in form of text messages and multimedia content such as videos, images and audio files. Libraries use this service to alert undergraduate Engineering students regarding outstanding fees, renewals, provision of call numbers, interlibrary loan, issue return notification, items on hold and new arrivals (Kumar, 2014).

Similarly, information professionals also make use of the social media platforms for information dissemination. Social networks are more appropriate for use on marketing information and delivering personalised information resources to groups of people or individuals. SMS notification can also be used through the use of social media networks

(WhatsApp, Telegram, Imo) and other web applications such as Google SMS, Twitter, Facebook and Pinterest (Prabhakaran & Kalyani, 2014). Information professionals use this technique to direct users to relevant or important websites, either on a certain topic or library adverts. Therefore, libraries use different methods to disseminate information resources and service, in order to notify undergraduate Engineering students on the current information resources available in the library which will in turn inform their skills acquisition.

Current Awareness Services (CAS) is another variable that can facilitate the acquisition of skills of Engineering students. CAS can be defined as a system, and often a publication, for notifying current documents to users of libraries and information services. Current awareness is also the process of keeping up to date. Current awareness services are used synonymously with Selective dissemination of information (SDI), however, there is a gap. Selective Dissemination of Information deals with provision of current awareness to users based on a statement of the individual's information requirements (called a profile), while Current Awareness Service is a system for notifying users of current documents. Current awareness then, is knowledge of recent developments in a field. It can also be defined as the dissemination of information that will keep clientele well informed and up to date in their fields of interest as well as their related subjects or disciplines.

In many respects, current awareness process is the opposite of the retrospective search. The retrospective search begins with the need to locate information on a specific topic for a specific purpose. The goal of current awareness on the other hand is less specific. It is the need to understand current developments in order to do one's work more effectively. Current Awareness Services may consist of one or all of the following components: summaries of recent events, table of contents services, Selective

Dissemination of Information (SDI), journal routing, book reviews, abstracts of articles, acquisitions lists, and calendars of events. A current awareness service may combine many forms such as acquisition bulletin, annotated index and conference alert.

The objective of current awareness service is to make available current information to those who need it, usually for current researcher and to sustain the interest of the library user in the services rendered by the library to make them lively and active readers for their benefits. Provision of information on recently required materials benefits all the users in several ways such as providing maximum exposure and utilization of the library information resources. Current awareness services is more effective and efficient with the adoption of internet facilities in Academic libraries.

Internet services is one of the variables that facilitates skills acquisition of Engineering undergraduate students. The Internet service has grown to become a major change in all aspects of life. Internet has become the major network infrastructure, linking millions of networks and hundreds of millions of machines and users. Internet has created a borderless world and a platform for mankind to interact and share knowledge with astonishing ease. As a result, interaction and communication from one corner of the globe to another could take place within seconds. With such potentials for speed, comfort and accuracy at relatively affordable cost, many people believe the world is going to be digitized within a decade. The Internet with its huge online, free, and easy accessed resources has brought a real revolution to the libraries and information services. New potentials have been offered, excellent range of services have become available. New literature comes as a result of the global connectivity and networking, terms like “virtual library” "digital library" “Electronic library” and “wall-less library” have become very common and familiar among information professionals. One of the most important features of the Internet is the web-Based resources that become

available online. These resources offer great useful tool for library services. They include not only fulltext online databases, statistics, and images but also video, audio, powerful search engines, discussion forums, email-alerting services, and many useful hypertext links among the related sites. Undergraduate Engineering students can widen the frontier of their skills acquisition through timely communication of a library's new holdings. These new resources expose them to latest research and discoveries in their field, which shapes their skills acquisition.

Online databases are another variable that facilitates skills' acquisition of undergraduate Engineering students. They are collection of electronic information resources uniquely or generally organised to suit the information needs of researchers from specific or multidisciplinary subject fields. Simply, a database is an organised collection of data in the form of schemas, tables, queries, reports, views and other objects (Iroaganachi & Izuagbe, 2018). Abubakar and Akor (2017) defined database as an organised collection of information. As the authors further observed, databases are often characterized by the type of information they contain such as text, numbers or fields. Online databases have become a major element of library collections around the globe. They are essential for learning, teaching and research activities. Samaravickrama and Samaradiwakara (2014) opined that their impact on academic libraries and scholars is noteworthy and unprecedented. These databases are organised digital collections of references to publish literature such as journal articles, newspaper articles, conference proceedings, reports, legal publications, theses, e-books among others. E-databases are in different types such as bibliographic, full-text, directory and multimedia (Larson, 2010). Iroaganachi and Izuagbe (2018) stratified databases into: centralized database, operational database, end-user database, commercial database, personal database and distributed database.

Whatever the nomenclature or stratification, online databases portend several advantages for undergraduate Engineering students. The robustness of subjects covered and the extent to which access is provided to databases' contents is a measure of the value derivable from the library. For example, the study of Iroaganachi and Izuagbe (2018) reported how return on investment (ROI) for universities subscribed journal collections were determined using access as a measure. The study further revealed the correlation among access to e-journal collection, number of articles consulted per time and the time saved by faculty. Abdullah *et al.* (2012) revealed that the quality of online databases determines faculty satisfaction and foster willingness for sustained use of same, thereby fostering skills acquisition. This is not without quality access because it is not enough for information to be available or even accessible bibliographically; it must be physically accessible to those who need them in order to stimulate use.

Librarians use various methods to disseminate information, provide current awareness services to enhance skills acquisition of undergraduate students. However, Nigerian University Libraries still engage in traditional methods of providing these services such as routing printed journals, distributing photocopied journals tables of contents, and simply browsing professional publications (Uzohue & Yaya, 2016). In addition, newer methods include conducting saved searches in preferred databases and creating email table of contents alerts. Each of these methods have disadvantages: Routed print material moves slowly, distributing photocopies is labour intensive, and browsing material requires extra time and active participation. Saved searches involve expert users and continual search amendments. Email alerts flood in-boxes already overflowing with unread items. It is based on these thresholds that this study is set to look at how the interplay of these different components facilitate skills acquisition of undergraduate Engineering students in federal universities in North Central Nigeria.

1.2 Statement of the Research Problem

With the proliferation of Information and Communication Technologies, undergraduate Engineering students are faced with a wide variety of skills to acquire such as technical skills, entrepreneurial skills and modelling skills. The library plays a focal role in providing information resources that would enable undergraduate Engineering students to acquire these skills with ease. The library disseminates information that would be of benefit to undergraduate Engineering students. Some of these information disseminated are in the form of Journals, newsletters, conference proceedings and so on. The library also deploys Current Awareness Services to put undergraduate Engineering students in the know about new additions in the library or generally resources that would be of benefit to them in acquiring these skills. There also exists thousands of online databases all channeled at skills acquisition for undergraduate Engineering students.

However, despite the methods used by libraries in information dissemination and provision of current awareness services, undergraduate students of engineering and graduates are still short of employable skills in Engineering industry. For instance, the researcher observed that in Nigerian National Petroleum Commission (NNPC) Kaduna, 2000 graduated students of Engineering came for interview during the last recruitment exercise and only 10 of them were employed. The over 1900 others were not recruited because they had inadequate skills. Hence, this research is planned to assess information dissemination, current awareness services and online databases as facilitators of skills acquisition by undergraduate students in Federal Universities in North Central, Nigeria.

1.3 Aim and Objectives of the Study

The aim of the study is to investigate how information dissemination, current awareness services, and online databases facilitate skills acquisition of engineering students in Federal Universities in North Central, Nigeria.

The specific objectives of the study are to:

1. find out the available online databases in the libraries in federal universities in North Central, Nigeria.
2. find out the level of skills acquisition gathered by undergraduate Engineering students from Current Awareness Services, online databases and information dissemination in federal universities in North Central, Nigeria.
3. ascertain the methods used for information dissemination, current awareness services and online databases in libraries for skills' acquisition.
4. determine the relationship between information dissemination and skills' acquisition in libraries of federal universities in North Central, Nigeria.
5. find out the relationship between Current Awareness Services and undergraduate Engineering students skills' acquisition in libraries of federal universities in North Central, Nigeria.
6. determine the relationship between online databases and undergraduate Engineering students' skills acquisition in libraries of federal universities in North Central, Nigeria
7. find out the factors militating against skills acquisition of undergraduate Engineering students in libraries of federal universities in North Central, Nigeria.

8. to find out if there is no significant relationship between the available current awareness services and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria.
9. to find out if there is no significant relationship between information dissemination and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria.
10. to find out if there is no significant relationship between online databases and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria.

1.4 Research Questions

The following research questions are formulated to guide the study:

1. What are the available online database services in the libraries in federal universities in North Central, Nigeria?
2. What are the level of skills acquisition acquired by undergraduate Engineering students from Current Awareness Service, information dissemination and online databases in Federal Universities in North Central, Nigeria?
3. What are the methods used for information dissemination, current awareness services and online databases in libraries for skills' acquisition in Federal Universities in North Central Nigeria?
4. What is the relationship between information dissemination and skills' acquisition in libraries of federal universities in North Central, Nigeria?
5. What is the relationship between Current Awareness Services and undergraduate Engineering students' skills acquisition in libraries of federal universities in North Central, Nigeria?

6. What is the relationship between online databases and undergraduate Engineering students' skills acquisition in libraries of federal universities in North Central, Nigeria?
7. What are the factors militating against skills' acquisition of undergraduate Engineering students in libraries of federal universities in North Central, Nigeria?
8. What is the significant relationship between the available current awareness services and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria?
9. What is the significant relationship between information dissemination and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria?
10. What is the significant relationship between online databases and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria?

1.5 Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

H₀₁: There is no significant relationship between the available current awareness services and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria.

H₀₂: There is no significant relationship between information dissemination and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria.

H₀₃: there is no significant relationship between online databases and skills acquisition of undergraduate Engineering students in federal universities in North Central, Nigeria.

1.6 Significance of the Study

This study will be of immense benefit to undergraduate Engineering students, Librarians, Libraries and Engineering profession.

The undergraduate Engineering students will be equipped with relevant information services and resources that will facilitate pertinent skills acquisition such as technical skills, professional skills, interpersonal skills and communication skills.

The librarians will benefit from the study, as it will help to provide 21st century approach in disseminating information services and resources, which in turn will facilitate skills acquisition of undergraduate Engineering students.

The libraries will benefit from the study, as the adoption of the result of the study will aid the library satisfy the information needs of the undergraduate Engineering students, thereby facilitate judicious use of the library.

Engineering as a profession will also benefits from this study, as the provision of information services and resources tailored towards skills acquisition of undergraduate Engineering students and in the long run, engineers, will facilitate graduation of qualified and skilled Engineering personnel, thereby improving and enhancing the productivity of Engineering profession.

1.7 Scope of the Study

The geographical scope of the study will be undergraduate Engineering students in federal universities in North Central, Nigeria.

The study will also cover the methods used for the dissemination of information, current awareness services, and online databases as requisite factors for skills acquisition by undergraduate Engineering students in federal universities in North Central, Nigeria.

1.8 Operational Definition of Terms

The following terms are defined as used in the study:

Current Awareness Service is the type of services such as communication of new information resources, rendered by the libraries for skills acquisition of undergraduate Engineering students in North Central, Nigeria.

Engineering consists of Electrical and Electronic, Civil, Mechanical, Chemical, Computer, Telecommunication, Metallurgical Engineering courses, which demand both technical and professional skills in federal universities in North Central, Nigeria.

Engineering Undergraduate Programme refers to Engineering programmes for the award of degree in Engineering in federal universities in North Central, Nigeria.

Facilitators assist in information dissemination, current awareness services and online databases to undergraduate Engineering students skills acquisition in federal universities in North Central, Nigeria.

Information Dissemination is the approach used by libraries to communicate resources and services that facilitate Engineering undergraduate students skills acquisition in federal universities in North Central, Nigeria.

Libraries are academic libraries whose institutions offer Engineering courses and owned by Federal Government in North Central, Nigeria

Online Databases are databases accessible online. They include JSTOR, EMERALD, Scopus and Science Direct.

Skills are dexterity needed by Engineering students in federal university in North Central, Nigeria.

Skills Acquisition is the process of gaining new knowledge or physical tasks that are profitable in the field of Engineering by undergraduate Engineering students in federal universities in North Central, Nigeria.

Undergraduate Engineering students are students enrolled for the award of Bachelor in Engineering in federal universities in North Central, Nigeria.

CHAPTER TWO

2.0

LITERATURE REVIEW

2.1 Conceptual Framework

The conceptual model as shown in Figure 2.1 describe the connection among the variables in this research

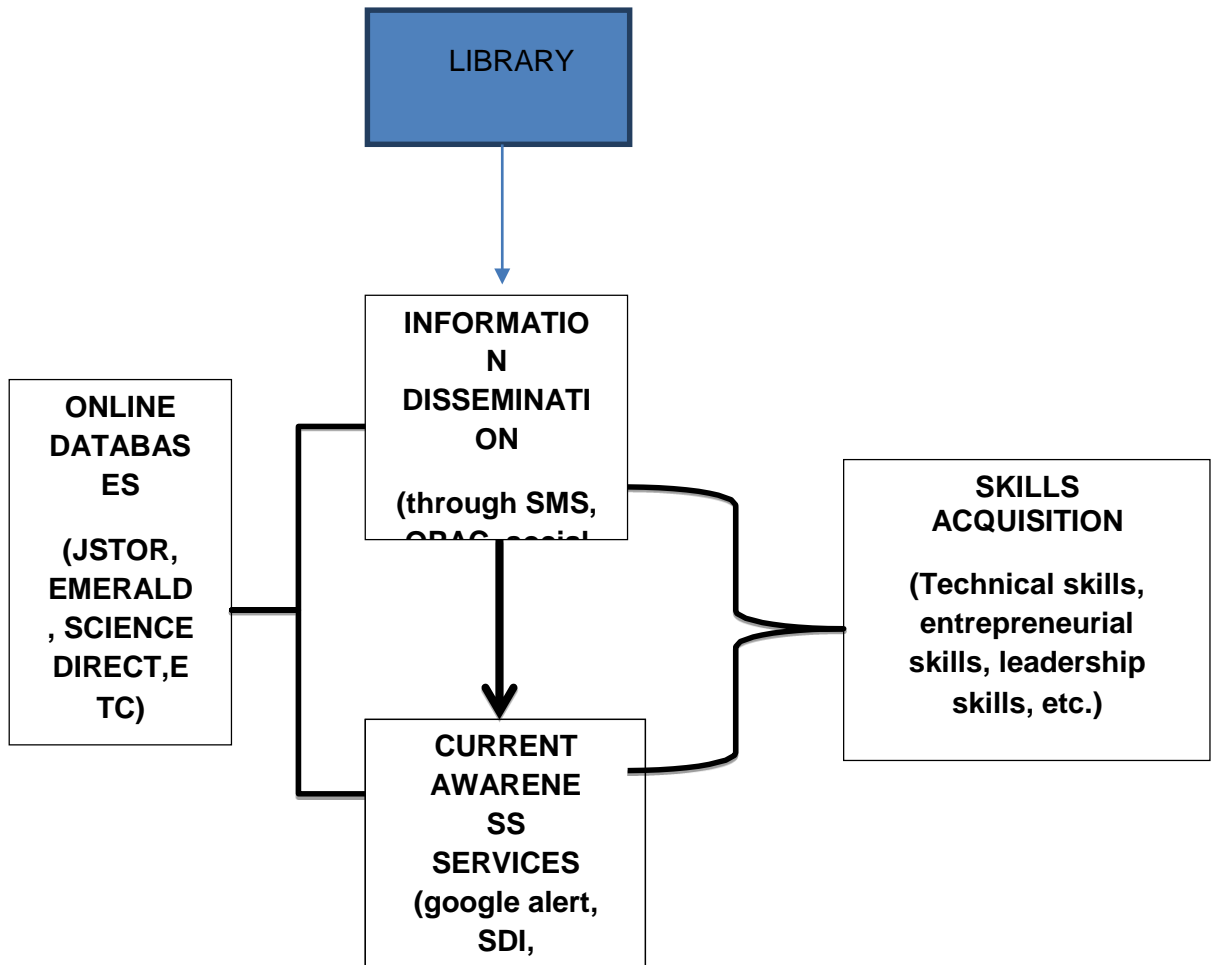


Figure 2.1: Conceptual model of the study

Figure 1 shows the schematic representation of the variables and the representation that exist between them. The library subscribes to different databases which contain information resources that facilitate skills acquisition of undergraduate Engineering students. The subscribed databases are then disseminated using different methods such as OPAC, book guide, library website. Information resources are also being

disseminated using Current Awareness Services (CAS). Current awareness services such as Google alert, selective dissemination of information are used to notify the users on the new arrived information resources that facilitate skills acquisition of undergraduate Engineering students. Figure 1, also shows that skills acquisition of undergraduate Engineering students is dependent on information dissemination and current awareness services.

2.1.1 Information Dissemination Vis-à-vis Skills Acquisition of Undergraduate Engineering Students

The invention of technology and continuous ICT developments are changing libraries in terms of information acquisition, storage, organization, maintenance and the methods of rendering services (Fagbola, *et al.*, 2011). The following are some of the methods used to disseminate information in the 21st century era. Most of these methods are self-service techniques which involve the use of technology such as laptops, smartphones, PDAs, MP3s, computers and many more.

- i. Online Public Access Catalogues and networked databases: due to online presence of catalogues, users are able to retrieve and access information resources in a timelier manner. Current OPACs can be accessed through the use mobile technology such as cell phones. Library users no longer need to be within the library walls for them to access OPACS and library databases. Information seekers retrieve various information sources through mobile Online Public Access Catalogues and mobile based databases such as Pub Med (contains biomedical literature with more than 26 million citations which may include Full-text content (PubMed, 2017). The New York public library, University of Liverpool library, Jefferson county public library and Nashville public library

are some of the best practices examples in the use of mobile OPACs (Nalluri and Gaddam, 2016). Thus, the Online Public Access Catalogues and networked databases are veritable tools for disseminating information to undergraduate Engineering students thereby, helping them develop skills.

- ii. Personal space/My Library: is a self-service platform where library users manage their personalized accounts with custom-made collections. Here users can set up and manage their profile, preferences for catalogue searches, receive alerts on reserved items, check their records, track interlibrary loan request, renew borrowed items and document delivery requests (Saxena & Yadav, 2013; Verma & Verma, 2014). National Tsing-Hua University (NTHU) library makes use of this technology by embedding the item's call number, location, title and ISBN (Wang *et al.*, 2012). This platform presents a new opportunity for electronic data interchange and selective information dissemination (Liu & Briggs, 2015). Information providers are able to send customised scanned documents, images, audio books and E-books to library users' personalised accounts (Saxena & Yadav, 2013). This library service is also a good platform for e-learning and / distance learning (Prabhakaran & Kalyani, 2014).

Academic libraries can harness the advantages of mobile technology to implement structures for distance learning by making information ubiquitous (Nalluri & Gaddam, 2016). For example; Duke University implemented a free iPhone application called DukeMobile, it contains information on digital library resources. It also allows widespread access to the library's digital photo archive (Vollmer, 2010). Personalised user accounts and library collections helps the users to feel in control of their information resources and increases more interest in accessing library resources. Through this tool, undergraduate Engineering students can have

better and a more personalized access to the right kind of information that they need, thereby, helping them develop skills.

- iii. Short Message Service (SMS) notification: It entails the use of mobile telephony systems to disseminate information in the form of text messages and multimedia content such as videos, images and audio files. Libraries use this service to alert patrons regarding outstanding fees, renewals, provision of call numbers, interlibrary loan, issue return notification, items on hold and new arrivals (Kumar, 2014; Negi, 2014; Wang, *et al.*, 2012). An integrated library management software is used to generate such notifications, for example; Libsys 0.7, AIM Hack, My Info Quest, Mosio's Text a Librarian, Upside wireless-used by UCLA Libraries (Verma & Verma, 2014). With this tool therefore, undergraduate Engineering students can be kept abreast and informed regardless of their geographical location.
- iv. Social media networks: information professionals also make use of the social platforms for information dissemination. Social networks are more appropriate for use on marketing information and delivering personalised information resources to groups of people or individuals. SMS notification can also be used through the use of social media networks (WhatsApp, Imo) and other web applications such as Google SMS, twitter, Facebook and Pinterest (Prabhakaran & Kalyani, 2014). A best practices Wiki offers a list of libraries that use various types of SMS notification services (including web-based SMS) and other mobile library services to interact with their clients. Examples include; Denton public libraries, Swiss National Library and Simmons College library (Library success, 2014). Through these social media, undergraduate Engineering students are well

informed about latest additions in the library, thus exposing them to more information and in the long run, proficiency in various skills.

- v. Quick Response (QR) codes are two dimensional barcodes that direct users to the desired websites (Library success, 2014). It is time saving technology that acts as a pointer to indexed or programmed URLs. The barcodes contain information about an item to which QR code is attached. Users with smartphones use their camera features to scan images and decode the information (Saxena & Yadav, 2013). QR codes are also known as mobile tagging (Verma & Verma, 2014). Information professionals use this technique to direct users to relevant or important websites, either on a certain topic or library adverts. This tool helps undergraduate Engineering students to have a quick and unhindered access to the right information that they need, thereby making the skills acquisition process quick and fun.
- vi. Online reference services: The high volumes of inquiries received by librarians can be overwhelming at times. Without being able to help clients within the least reasonable time, customer service satisfaction will be affected. Technology has made it possible for librarians and information providers to attend to multiple customer queries at the same time (Lippincott, 2010). Using mobile reference service technologies, brief responses to customer enquiries such as opening hours, call numbers, and dictionary definitions can be provided instantly in real time (Liu & Briggs, 2015; Saxena & Yadav, 2013; Verma & Verma, 2014). For example: live video calling can be done through Skype, Imo and WhatsApp to chat with a reference librarian. Online platforms allow reference librarians to create a bond with patrons and improve their efficiency through provision of 24/7 reference services (Barnhart & Pierce, 2011). A study by Saxena and

Yadav (2013) revealed that due to provision of mobile reference services, the Saint Louis University School of Public Health library experienced improved marketing and delivery of library resources and services. The library was also able to cultivate and strengthen liaison relationships. Online system allows patrons to play videos on their mobile device through the use of Wi-Fi or 3G network (Wang *et al.*, 2012). Videos can be searched using access points such as name of creator or title of the video (Prabhakaran & Kalyani, 2014). This tool therefore, enables undergraduate Engineering students to have their queries sorted out in record time.

- vii. Library web sites are being used in various libraries for marketing purposes and announce news or upcoming events to their clients. Techniques such as Cascading Style Sheets (CSS) or Auto-Detect and Reformat Software (ADR) are used to enable websites to rearrange and adapt to the size of the mobile device being used (Nalluri & Gaddam, 2016). With the influence of mobile technology, libraries are transforming websites into mobile friendly interfaces (Nalluri & Gaddam, 2016; Negi, 2014). Every library should have a website that will enable information dissemination and access by all types of users.
- viii. Mailing lists: This is the most common method of information dissemination. Using email in library services is paramount and allows for groups of people to receive personalised information at the same time. This personalized information would enable undergraduate Engineering students to have access to the information that they need to develop skills.
- ix. Library Publication: According to Agyen-Gyasi *et al.* (2010), library publications are an effective means through which libraries can market their resources to users. Among such publications are Readers Guide, Library Bulletin

and Accessions Lists. Reader's Guide includes information on the layout of the library, opening and closing hours, names and designations of the professional staff, organization of the library, rules and regulations, registration procedures, borrowing privileges and procedures and how to use the catalogue. This Guide is an important document because it introduces the new user to the library resources and most importantly, it makes the user aware of the library's rules and regulations. According to Agyen-Gyasi, *et al.* (2010) the Reader's Guide is a very important publication because no library's service is complete without its guide that provides information about its resources and the way to make optimal use of them. The Library Bulletin is a publication that reports on the policies, programs and events of the Library. The Library Bulletin includes new services and staff matters like promotions and resignations; it becomes useful and relevant if it is timely and regularly published. Agyen-Gyasi *et al.* (2010) stated that all the public university libraries with the exception of University Library as a result of inadequate finances no longer publish their bulletins. An Accessions list keeps track of a library's recently cataloged titles, and produces complete lists of volumes of a given library. Agyen – Gyasi, *et al.* (2010) stated that, the accession list gives details of the materials that have been processed and added to a library's stock over a defined period. It is a way of marketing the resources in a particular library which could be either print or electronic. Library publication would therefore avail undergraduate Engineering students with knowledge on the holdings of the library, thereby help them to fully utilize these resources and the resultant effect will be skills development.

x. User Education and Information Literacy (IL)

The library also disseminates information during orientations and the teaching of IL programs in their respective institutions. User education and IL are essential. They help publicize library services and improve the image of the library. During orientation and the teaching of IL, students are exposed to the arrangement of the library, the location of the various collections and service points, the nature of the classification scheme used and the catalogues. The various library products are also explained. Other relevant information on the library including the membership, registration procedure, borrowing privileges and the rules and regulations governing the use of the various libraries are also highlighted.

Therefore, it is safe to say that the information disseminated by the library is a vital ingredient in facilitating skills acquisition among undergraduate Engineering students in North Central Nigeria. User education would eliminate data smog amongst undergraduate Engineering students. This is achieved by these students having a better understanding of the library resources, their location, how to use them and so on. This would help these students to develop skills in the long run.

2.1.2 Current Awareness Service Vis-a-vis Skills Acquisition of Undergraduate Engineering Students

Current awareness services (CAS) is the most used library service supporting research activities (Uzohue & Yaya, 2016). According to Keenan and Johnston (2015) current awareness services (CAS) is a service or publication designed to alert scholars, researchers, readers, customers and employees to recently published literature in their fields of specialization, usually available in special libraries serving companies, organizations and institutions in which access to current information is essential. Such services can be tailored to fit the interest profile of specific individuals or group. It is

done by distributing photocopied content pages of all newly added library materials such as journals as well as the simple browsing of professional publications in the library (Guzman, *et al.* 2015). Other ways of implementing CAS were through bibliographies, journal circulation, bulletin board display, new titles list, circulation of journal titles and content pages, newspaper clippings, bookmarking relevant Internet sites and current awareness bulletins (Agcaoili & Resurrection, 2006). It is an effective device alerting users on the latest development in the library to help them be continuously aware of new information (Uzohue & Yaya, 2016).

Singh and Mahajan (2014) agreed that CAS is sometimes used synonymously with Selective Dissemination of Information (SDI). Current awareness service as a facilitator of skills acquisition for undergraduate Engineering students is essentially provided to keep users up to date with the happenings in their subject areas of interest. Igbokwe (2012) noted that CAS ensures that users are aware of recent developments in their fields of interest; hence users are informed of latest documents available to the library or information obtainable elsewhere. The information can be made available to the users through telephone calls, e-mail messages, letters, preprints of papers, photocopy of tables of content, periodical routings, maintenance of card files of references, library bulletins, subscription to specialized services, electronic news groups, etc. Back covers of a selection of recent acquisitions could also be displayed. Libraries publish accession lists or acquisition lists at regular specified times to provide the full bibliographic details of materials recently acquired by the library. The order of arrangement of the new documents is usually by major subject categories and sent to the users directly or posted on a notice board through the electronic mail.

White Hall (2013) stressed that current awareness services, sometimes called selective dissemination of information, is the ability of a service to notify a client of material that

matches the interests of the client. This involves scanning of material, recognizing relevant information in the material, summarizing the information and presenting the summarized information to the client. In that way, the client can decide whether or not to go ahead with acquiring the material or to wait for other information. Unlike current awareness service, which is more or less a group service, SDI is a personalised service. The user of course would have provided the library staff with his research profile; which enables the librarian to determine the users' area of interest with precision. In addition, SDI helps to save time and money for the clients by making them aware of certain things, like: products, services and sources of information relevant to their area of interest.

Guha (2015) and Mansourian (2011) stated that current awareness service is a useful device through which users can be informed promptly about information generated on a subject or an area in which a group of scientists are involved in research pursuits. Kumar (2014) draws attention to the fact that current awareness services aim at bridging the time lag between the publication of primary documents and their coverage in secondary information services. Therefore, it is pertinent that all academic libraries should offer current awareness services as an important function to foster acquisition among undergraduate Engineering students.

Uzohue, and Yaya (2016) mentioned CAS as the most dynamic, challenging and practical use service in providing excellent and current information that may help users obtain new knowledge for future improvement and development. Again, Uzohue and Yaya (2016) argued that CAS is one of the library services that make the access to library resources faster and easier.

Rossouw and Fouries (2007) revealed that the mode of CAS in university libraries was traditionally on print form by making photocopies of the table of contents and brief

reviews served to the users. In that case the users are mostly benefited by being physically present in the library. On the other hand, Johnson *et al.* (2009) asserted that due to advent of technology, especially, Internet current awareness services are being delivered through personalised mail, list serves and other bulletins. Presently the users need not to be present in the campus while availing the service.

Leatherman and Eckel (2012) revealed that only in the current Internet era, with the advent of saved searches, e-mail alerts, and RSS feeds, have CA services become relatively convenient for users to set up and maintain on their own updates. Really Simple Syndication (RSS) and Rich Site Summary are XML files that enable users to track new updates to a web site without having to visit that web site over and over. RSS is now widely used by scholarly publishers and database companies to syndicate database and tables-of-contents alerts.

Naqvi (2013) typified that current awareness services exists in many ways in university libraries such as library bulletin and newsletters, notice boards, list of current resources (new arrivals), subject bibliography, table of content, news clipping service, abstract bulletin, E-mail and telephone services.

- i. Library Bulletins and Newsletters

Library bulletins are publications by a library, done periodically throughout the year to keep library users up to date with current opening hours, services and events. One of such bulletins is the newsletter. A newsletter is a printed or electronic report containing news concerning the activities of a business or an organization that is sent to its members, customers, employees or other subscribers. Newsletters generally contain one main topic of interest to its recipients. A newsletter may be considered grey literature.

E-newsletters are delivered electronically via e-mail and can be viewed as spamming if e-mail marketing is sent unsolicited.

Olanlokun and Salisu (2014) reason that the library usually has a bulletin board where news rereleased or important information about the library is pasted and the library can have more than one board. In a pictorial presentation, Hesson (2009) revealed that libraries can use bulletin boards to encourage users to patronize their services and to buttress how reading can impact positively on them.

ii. Notice Boards

According to English Dictionary (2003) a notice board is a board on which notices, advertisements, bulletins, etc. are displayed and added that notice boards are a simple and easy way of passing information and keeping people informed. Notice boards are used for announcing office events, important organizational issues, and new regulations/office requirements and possibly for items such as employee recognition. The ideal office notice board is situated within an office near a door where staff can see it as they pass. The content should be kept up to date and someone is put in charge of updating materials at least once a week. People will stop looking at a notice board that contains out of date materials or looks scruffy.

iii. List of Current Resources (New Arrivals)

Libraries enlist their new arrivals in the accession register and undergraduate Engineering students can use these registers to have an idea of current resources been acquired in the library.

iv Subject Bibliography on Demand

Subject bibliography is a directory of printed works according to subject. Undergraduate Engineering students demand for this to get information on current additions on a particular field.

v. Table of Content

This is usually found on a page before the start of a written work, of its chapter or section titles or brief descriptions with their commencing page numbers. Undergraduate Engineering students glance through this to ascertain the usefulness of the material in line with the information that they seek.

vi. News Clipping Service

This provides clients with copies of media content, which is of specific interest to them and subject to changing demand; what they provide may include documentation, content, analysis, or editorial opinion, specifically or widely.

vii Abstract Bulletin

These are bulletins that are published to showcase latest developments in a particular field or subject. Undergraduate Engineering students consult this to get information on latest development in their field or in a particular subject.

viii. E mail/Telephone Service

The library mails it's clientele on new additions in the library. This is made possible through the use of user profiles. The user profiles contain the personal information of the user (which includes email address and phone number) and this makes it possible for the library to mail or call users to inform them of current additions.

Since academic libraries are mandated to enhance the teaching skills and research mission of an institution, library services must have to be promoted especially CAS (Namugera, 2014) to help undergraduate Engineering students to be aware of the recent news and information and help them save their effort and time of scanning and browsing journals, bulletins, newsletters, and websites (Rossouw & Fourie, 2007). Current awareness services are used in keeping track of the forthcoming events, support researches and publications for high quality researches (Rossouw & Fourie, 2007) and to influence the progress of a research work and ensures that all current information is made to be available at the right time and in convenient form (Dongardive, 2013). CAS provides researchers the information they needed in the scientific and technical disciplines to be able for them to assimilate relevant information that can be essential in advancing their own research and their knowledge on their field. Users can easily retrieve new information locally or internationally in an easy process, access more current contents of resources, connect to the wide-range of information for their researches (Akussah *et al.*, 2015). Therefore, libraries can make information available to all users with the use of CAS (Sodhi, 2005).

On the other hand, Bell (2012) suspected that most academic librarians are no longer familiar with the art of current awareness and that may be an unfortunate shift in their practice. Moreover, Naqvi (2013) indicated that there is a growing dissatisfaction among users due to non-availability of needed documents and lack of provision of services could be boiled down to some extent not rendering at least CAS or current contents of information about the latest addition to users.

In order to make current awareness services more effective for undergraduate Engineering students, Kpakiko and Shehu (2013) opined that university libraries should emphasize on user friendly, modern and dynamic technological tools such as university

website, library portal, Really Simple Syndication (RSS) feeds, mobile Short Message Service (SMS), email services, facebook, whatsapp group, library blogs, twitter, online discussion groups among others in carrying out current awareness services for timely information delivery.

2.1.3 Online Databases vis-à-vis Skills Acquisition of Undergraduate Engineering Students

Online databases are collection of electronic information resources uniquely or generally organised to suit the information needs of researchers from specific or multidisciplinary subject fields. Simply, a database is an organised collection of data in the form of schemas, tables, queries, reports, views and other objects (Iroaganachi & Izuagbe, 2018). Abubakar and Akor (2017) defined database as an organised collection of information. As the authors further observed, databases are often characterized by the type of information they contain—text, numbers or fields. Online databases have become a major element of library collections around the globe. They are essential for learning, teaching and research activities. Samaravickrama and Samaradiwakara (2014) opined that online databases impact on academic libraries and scholars is noteworthy and unprecedented. These databases are organised digital collections of references to published literature such as journal articles, newspaper articles, conference proceedings, reports, legal publications, theses, e-books among others.

Information retrieval is concerned with all the activities that related to the organization of information, its processing and providing access to the recorded information in different forms and formats. The practice of Information Retrieval has been a part of human technological development since the time of writing. Information Retrieval (IR) systems were developed to retrieve relevant data from the huge collection of

information in response to users' queries. These systems are the results of many research and development activities that were carried out more than 50 years ago. Before 1960s, the major function of IRS was to organize information.

The examples of earliest IR systems included the tools or organization schemes of ancient archives and libraries, viz 'Sumerian archives' or the 'Pinakes' developed by Callimachus for the library of Alexandria. With the evolution time and techniques many IR systems evolved. However, the strong need for managing the increasing amount of information in the field of business and scientific development gave impetus for the development of automated IR systems. Consequently, the concept of automated retrieval system was developed for carrying out automated searches for recorded collections of information. However in 1945, the concept of using machine based systems for storage and retrieval of information got recognition after a writing by Vannevar Bush (Larson, 2010). Hence, initial IR systems allowed people to interact with an information system in which information is recorded to find relevant information of all forms, that is, text, images, audio video recordings to fulfill their specific needs. A typical information retrieval system functions in two ways, on one side it analyses the contents, on the other side, it evaluates the user queries to match them with each other and retrieve the relevant information from an organised collection of documents according to users' needs.

Generally, the term automated IR systems were used in computer-based systems for different types of computer methods used for information storage and retrieval, accommodating significant growth of both information and its needs. These IR Systems stored data in computer files, accept requests, search the files against the request and provide information that is relevant for the requester.

These systems were mainly designed to store large number of records and to facilitate their quick and easy access in response to the request. Later on, the hasty developments in information and communication technologies (ICTs) such as, emergence of Internet and World Wide Web (www) technologies have brought major changes and improvements in the way the information was collected, stored, retrieved, and distributed. The introduction of online Information Retrieval systems is one of the major outcomes of application of ICTs in information retrieval. These new systems facilitated searching of remotely located records of information with the help of ICTs.

According to Xie (2010) Online IR systems can be characterized as IR systems that allow remote access with searches conducted in real time. Users generally search information from four types of online IR systems: online databases, online public access catalogs (OPACs), Web search engines and digital libraries”. While, Online IR systems are also known as professional online systems, which are also abbreviated as online systems or online databases (Tague-Sutcliffe, 2010). Therefore, an online database is widely recognised as a typical Online IR system.

Online database is one of the products of information and communication technologies involving searching of information from remote located databases via computers and communication networks. The database can be accessed through some intermediaries or vendors by means of online networks. Before the 1980s, online databases were mostly concerned with the retrieval of bibliographic information from recorded contents of information. Afterwards, these databases began to be included as numeric information, then full-text information was incorporated in these systems.

The main purpose of an online database is to retrieve the information that fully or partially matches with the user’s query. Presently, the online databases comprise of

abstracts, citations, full texts, statistical information in the form of journals, magazines, dictionaries, government documents, financial reports, audio and video contents and so on.

2.1.4 Historical Overview of Online Databases

Online database systems developed as a result of ICT applications in the process of information retrieval, and over the past five decades these have undergone several changes in their searching and retrieval capabilities. Online databases have the long history of developments that fall into several periods of time as stated in the Online Information System (1977) and Information Storage and Retrieval (1829). Before the 1940s the information retrieval systems were purely of manual type, such as indexes and catalogues. These systems included pre-coordinate and non-manipulative retrieval devices. The period of 1940s brought about an important development in the history of information retrieval, that is, the invention of post-coordinate and manipulative retrieval systems, though these systems were entirely manually operated. These included Peek-a-Boo or Optical Co-Incidence Systems introduced by Batten and Cordonnier, Edge-Notched Cards System developed by Mooers and the Uniterm System of Taube. These early post coordinate systems were the predecessors of modern computer-based systems. Actually the two fundamental forms of file organization that is, term entry and item entry were introduced by Batten and Mooers in the 1940s and they became the base element in the designing and development of modern information retrieval systems (Chutia, 2015).

In the 1950s, Punched Card Data Processing Systems based on the earlier forms of mechanization was introduced in the late 1950s, techniques of automatic indexing were developed by Hans Peter Luhn. During 1950s, the first computer-based retrieval

systems were introduced as the immediate predecessors of the computer-based systems of the 1960s. (Chowdhury, 2010).

The period of 1960s was identified as the era of computer retrieval with an off-line, batch-processing, tape-oriented model. In the early 1960s, a number of information centers and government agencies in the United States started to use these information retrieval techniques for developing their operations, e.g., the National Aeronautics and Space Administration (NASA) used computer systems to publish its index in Aerospace reports and the National Library of Medicine (NLM) used these techniques to publish Index Medicus (index to medical literature) However, the major off-line systems were developed during the 1960s, but the widespread transformation of operations from off-line to the on-line mode was observed in 1970s. (Chowdhury, 2010).

In the late 1960s and early 1970s, different types of reference databases were made available through different online national database services including, MEDLINE service of the National Library of Medicine, the bibliographic services of OCLC and RLIN and many other commercial and governmental services. Presently, these online IRS are globally used along with hundreds of reference databases accessible through them. Since 1975, on-line systems were used more frequently for providing information services. Some of the online databases developed to provide access to a wide range of information including, Chemical Abstracts Service (CHEMCON), Engineering Index (COMPENDEX), the National Technical Information Service, the Science Citation Index, the Educational Resources Information Center (ERIC) and the machine-readable data base of the National Agricultural Library. (Larson, 2010)

The growth of online databases can also be interpreted in terms of number of database producers, providers or vendors. During the 1970s online service industry had continued

to grow. Online search services, or vendors, are those organizations that provided value-added services to databases with several search capabilities. The online service providers obtained databases through licensing agreements and loaded these on its own computer to provide subscriptions of them on payment basis to institutions and libraries. The major online service providers included; the Dialog System Development Corporation (SDC), Lockheed Information Systems (ORBIT), Mead Data Central and Bibliographic Retrieval Service (BRS). Several major online service providers are now providing access to a number of online databases that became the central interest of libraries. (Kopal, 2015).

In addition to this, the Text Retrieval Conference (TREC) series of experiments and conferences have also played an important role in the development of information retrieval research and development activities (Chowdury, 2010).The Text Retrieval Conference (TREC) project was launched in 1992, under the sponsorship of the U.S. National Institute of Standards and Technology and the U.S. Advanced Research Projects Agency, has conducted many constant and dedicated attempts on interactive searching. The purpose of the TREC project was to provide a forum to compare a variety of approaches to information representation and retrieval (Sutcliffe, 2010).It proposed general framework for the investigation of interactive information retrieval, evaluation and comparison of the performance of interactive IR systems (Singh & Mahajan, 2012).

i. Timeline of Developments in Online Information Retrieval System

Online retrieval systems had been developed as a means to facilitate searching of bibliographic information. The historical developments of online databases as illustrated

here were mainly focused on the developments that occurred during different periods of time:

1. The first experiments in on-line information retrieval conducted by Kessler at MIT in 1964 brought the Kessler's experimental system in physics, known as the TIP (Technical Information Project). It was the first on-line system for bibliographic searching, which included non-conventional methods of searching (Kopal, 2015).
2. In 1964, the Medical Literature Analysis and Retrieval System (MEDLARS), one batch retrospective search service of the National Library of Medicine (NLM) was made available to the general public.
3. System Development Corps (SDC) information services demonstrated the first interactive online system, 'Protosynthex' developed by Robert Simons and John Olney, in 1960.
4. In late 1964, the Bibliographic Organization for Library Display (BOLD), a system for browsing of literature citations on magnetic tapes was developed by Harold Borko, H. P. Burnaugh and W. H. Moore at SDC. It was one of the first systems capable of displaying an online thesaurus.
5. In late 1967 NLM (National Library of Medicine) experimented with SDC's Online Retrieval of Bibliographic Information Timeshared (ORBIT) retrieval language to search NLM'S database of 10,000 citations on neurology
6. In 1970 NLM introduced MEDLINE as a free database of more than 400,000 citations. While, in 1972 NLM started to use TYMNET, the first public telecommunication network to access to MEDLINE.
7. In 1962 Roger K. Summit designed the DIALOG language for the Lockheed Information Sciences Laboratory.

8. RECON (Remote Console), the first large-scale, on-line, retrieval system of the National Aeronautics and Space Administration (NASA) became fully operational in 1969. Now, the RECON, a NASA database is recognized as an international system for on-line search in Europe through the European Space Agency.
9. In 1970s, 'The New York Times Information Bank' an important on-line system became operational for providing access to current awareness information from The Times and other selected sources.
10. In 1972, Lockheed's information service became commercially available as DIALOG information retrieval Service with two bibliographic databases of scientific and technical information.
11. By 1985, DIALOG had become the most comprehensive online information service in the world, with more than 200 separate databases in business and economics, chemical, patent and trademark information, science and technology, medicine and the biosciences, news and current events, education, directories, energy and the environment, law and government, computer science and microcomputers, books, the social sciences, and the humanities.
12. Mead was mainly associated with the development of full-text online information services primarily for law and legal research. In 1972, this service introduced commercially as LEXIS an outgrowth of Ohio Bar Automated Research (OBAR) and in 1980 NEXIS, a full text information service for news and current events; and MEDIS was introduced in 1985 for medicine.
13. Bibliographic Retrieval Service (BRS) expanded by 1985 to include 73 separate databases in the life sciences, medicine and pharmacology; the physical and applied sciences; education; the social sciences and humanities; and business.

14. In 1907, the American Chemical Society (ACS) published Chemical Abstracts as an index to chemical literature.
15. In 1980, CAS introduced CAS ONLINE as an online dictionary of chemical substances and it was expanded in late 1983 to include the database of Chemical Abstracts citations dating back to 1967. CAS made available several millions of unlicensed abstracts for citations in the database available through CAS ONLINE.
16. In the late 1970s a consortium of British producers of scientific, technical, and patent databases created INFOLINE. In 1981, INFOLINE was purchased by Pergamon Press and developed as Pergamon INFOLINE.

Since then, the online databases have continuously grown in numbers and scope. Today millions of online databases are available in different fields of education and research to cater to diverse needs of different types of users and these may be subject specific, interdisciplinary or multidisciplinary. Some of the well-known online databases are: Medline, Science Direct, BIOSIS, JSTOR, Annual Reviews, Emerald insight, Cambridge University Press, Oxford University Press, Chemical Abstract, Web of Science, Scopus and LEXIS and Taylor & Francis.

Characteristics of Databases

i. Organized Collection

In an online database, contents are arranged logically to facilitate easy access and retrieval. Documents in such types of systems are organized in a suitable manner for carrying out easy and fast retrieval of information (Kopal, 2015)

ii. Credibility

In online databases, recorded contents of information are reviewed by subject experts and publishers to maintain credibility and authenticity of the resources. The contents of database are finely evaluated in terms of their accuracy and credibility (Kopal,2015)

iii. Usability

The well-defined organization of information contents and search capabilities of online databases allow users to search and retrieve results more efficiently and effectively (Kopal,2015)

iv. Conversational

Searches in online databases are conducted as a two-way communication between the searcher and the system, in which each gets a chance to communicate with each other. Therefore, online databases are referred to as interactive or conversational (Kopal,2015)

v. Expert System

Online databases are characterized as expert systems that provide information on specialized areas of knowledge, e.g. a nuclear database gathers specific information on nuclear sciences from experts or specialized associations and provides particulars of the nuclear sciences (Kopal,2015).

vi. Controlled Vocabulary

To support searching, online databases usually have their own controlled vocabulary. Controlled vocabulary is largely used for information presentation and retrieval, though the keyword searching is also supported by almost all the online systems (Kopal,2015)

vii. Permanence

Published documents, such as journals, reviews and books, etc. in online databases do not change frequently. These information documents remain in databases for a long time in the form of archives to again retrieve the information (Kopal, 2015)

viii. Up-to-Date

All the online databases comprise current information on its concerned areas. Online database providers or publishers are regularly updating their contents by adding new information to provide current and copyrighted scholarly materials ((Kopal, 2015)

ix. Real-time

Real time in online database operations implies that the remote terminals respond quickly to the user's search processes. Remote terminals receive data, search the information, and return the results more frequently to be utilised by the users in ongoing activities (Kopal, 2015)

x. Time-sharing

On-line time-sharing implies the sharing of machine processing time among a number of terminals. It means that the processing time of the computer is equally shared amongst independent activities. By time sharing many users can search the information simultaneously either from the same place or variant locations (Fortune, 2014)

2.1.5 Types of Online Databases

Online databases are divided into the two main categories: Reference and Sources databases, on the basis of information incorporated in them. According to Chowdhury (2010) online databases are categorised under the two major divisions such as, reference

databases and source databases. Reference databases direct seekers towards the source of information, while source databases include actual information itself. On the basis of content, scope and the information incorporated, online databases are grouped under the following categories:

- i. On the Basis of Information Incorporated
- ii. On the Basis of Scope of Data
- iii. On the Basis of Contents
- iv. On the Basis of Providers

I. On the Basis of Information Incorporated

Based on the information included in online databases, this category comprises the most common forms of online databases, which are grouped into the following four types: Full-text Online Databases, Reference Databases, Numeric Databases and Multimedia Databases

a. Full-text Online Databases

A full-text database is a compilation of documents or other information in the form of database in which complete text of each referenced document is available for online viewing, printing, or downloading. In addition to, text documents, images are often included as graphs, maps, photos, and diagrams. Full text online databases are comprising full text information of the publications that are basically either print or online in origin. It includes large files of text such as, all the paragraphs of a journal article or all the chapters from a book along with abstract or citations of the text files incorporated in them. According to Larson (2010) full-text online databases are now being used as effective and important sources of periodical literature that are not usually

available in local collection of libraries. Examples are JSTOR, Emerald insight and Wiley Online Library (Chowdhury, 2010)

b. Reference Databases

The reference databases include terms descriptive of content on which retrieval is based and some databases also provide abstract to give brief description of original documents and in these databases the retrieval of information is mostly based on the words that appeared in abstract. The retrieved data helps requester to identify where an original source can then be found (Online Database, 2012). The reference databases provide bibliographic descriptions to published literature. It provides abstract, references or citations to documents. These databases are divided into bibliographic and referral databases (Chowdhury 2010).

Bibliographic Databases

Bibliographic database is one of the most important forms of reference databases. These databases are widely used as reference tools and provide citations or references, abstracts and index to published literature. Online bibliographic databases provide quick information about publications, which may or may not be available in library's own collection. These are the excellent means to access information, rather than merely an item of information in the collection of any library. Bibliographic databases contain elements of bibliographic description that used to describe books, journals, documents, and other publications or portions. Larson (2010) stated that these databases that are typically online bibliographic files, are the online equivalent of print abstracts and indexing services and mostly used for bibliographic verification of literature. Examples are LISA, Indian Citation Index, Scopus and Web of Science to mention but a few (Chowdhury, 2010)

Referral databases

Referral databases direct users towards the particulars of actual source of information that is, name of a person or institution. It offers references to information, such as names, addresses, specialization of persons, institutions, information systems, and so forth. Examples are Ulrich's Periodicals Directory and Electronic Yellow Pages (Chowdhury, 2010)

c. Numeric Databases

A numeric database is a computer-readable collection of data that are primarily numeric in nature. These are also known as the fact sources and non-bibliographic databases and are mostly used for supporting business or financial research. These databases include organised numerical data along with brief textual description and provide access in the form of statistics, demographic and financial reports, stock market quotations, chemical and physical properties, and chemical nomenclature and graphic structures etc. These are the files of primarily statistical information from which a user can extract specific forms of data. Examples are COMPUSTAT and ProQuest Statistical Insight (Chowdhury, 2010).

d. Multimedia Databases

A multimedia database is a collection of related multimedia data objects of different types. A multimedia database contains various data types such as images, sound recordings, video recordings, signals, graphics together with text data etc. Multimedia databases host different types of media file, such as .txt for documents, .jpg used for images, .swf deals with videos, .mp3 use for generating audio files etc. These databases involve the activities related to acquisition, generation, storage, processing and

transmission of multimedia data over networks. The databases primarily provide access to art prints, animations, photos, audio clips, videos and other multimedia contents. Examples are Artstor and Academic Video Online (Chowdhury, 2010).

II. On the Basis of Scope of Data: Online databases can be classified by the scope of information contained in them such as general interest databases, discipline specific databases and subject specific databases (Chowdhury, 2010).

a. General Interest Databases

Such types of databases provide a broad range of information on different subjects and disciplines. General interest databases comprise of information that is more general in nature, like current news and opinion, social and political affairs, cultural, educational, health and on public issues. Examples are Academic Search Complete (EBSCO) and Encyclopedia Britannica (Kopal, 2015).

b. Discipline Specific Databases

Discipline-based databases are somewhat more specific than general interest databases. These provide information on several related areas. If information is not found in general interest databases then it is better to search in such types of databases. Examples are SocINDEX and PAIS (Public Affairs Information Service).

c. Subject Specific Databases

These databases are well suited for in-depth research and study on a particular topic. These databases provide information from professional publications and scholarly journals. The subject specific databases are devoted to only one subject. Searches in subject specific databases are more comprehensive in nature to provide access to more scholarly articles. Examples are Historical abstracts and PsycINFO (Chowdhury 2010).

III. On the Basis of Contents

Online databases can be organised according to the type of documents they possess, such as: article databases, theses and dissertation databases, citation databases, audio/video databases, dictionary databases, directory databases, indexing and abstracting databases and so on (Chowdhury, 2010).

a. Article Database

An article database allows a person to search across thousands of various journals and magazines to locate an article on any specified subject. Article databases mostly provide full text of articles, but sometimes they also provide abstracts of articles. Some online databases only present citations instead of full text article or an abstract that helps to locate the original article. Examples are Google Scholar and Annual Reviews (Chowdhury, 2010).

b. Theses/Dissertation Database

Theses/dissertations databases are developed to maximise the visibility and availability of research output and to provide opportunities for further research. Such databases enable searching for dissertations and theses through a single access point, which presents an extensive and authentic collection of millions of research works in full-text (Chowdhury 2010). These databases are the record of doctoral theses or dissertations awarded by Higher Education institutions. Examples are ProQuest Dissertations and Theses and Electronic Theses Online Service (ETHOS).

c. Citation Database

Citation databases are index of citations of published literature. It enables to locate bibliographic citations for journal articles and track articles in a specific subject. It

allows users to track which current documents cite which previous documents. Many citation databases include index of journal articles along with its abstracts. By searching with keywords that might appear in an article, users can retrieve citations of an article. Examples are Scopus and Web of Science (Nisonger, 2003).

d. Audio / Video Database

An audio video database is a collection of audio video materials such as digital audio and video data and audio video activities. Examples are Audiovisual Database of Spoken American English and Academic Video Online (Delponte *et al.*, 2015)

e. Online Catalogue Databases

An online catalogue database is a bibliographic database that describes the books, periodicals, and electronic resources that are available in the library. Online catalogues are those online databases that enable users to search for documents by author, title, subject heading, keyword, call number, or government documents number available in a particular library. Examples are IndCAT and WorldCat (Akussa, 2015)

f. Dictionary Databases

In dictionary databases, just like directory catalogue each record identifies something. The purpose of dictionary databases is to provide a measure of control in the use of bibliographic databases. Examples are Oxford English Dictionary and Chemical substance Dictionary (Anasi, 2015).

g. Directory Databases.

Directory databases offer the information of published directories or serve a purpose similar to that of published directories without having published equivalents. These are

not full-text databases although they may represent the complete text of a publication in machine-readable form; nor are they numeric in nature. Examples are Electronic Yellow Pages and Encyclopedia of Associations (Akussa,2015)

h. Indexing & Abstracting Databases

These databases provide brief summary of publications along with descriptors as access points to documents. Such databases provide clues to the relevance and location of the publication. Examples are SocINDEX and Educational Research Abstracts Online (ERA) (Kopal, 2015)

IV. On the Basis of Providers

Based on their providers, online databases can be classified into the following categories:

a. Publisher /Commercial Databases

Publisher databases are produced by online commercial service providers that sell their data to the clients and deliver information through the telecommunication networks. These databases are commercial electronic information services that people access through the Web or Internet. Anyone can download or electronically copy the information contents from the Internet anywhere in the world through database's home page. To access such types of databases, searchers need to have an authorization number and password provided by the publishers. Examples are Oxford University Press and Taylor & Francis (Anasi, 2017)

b. Institutional Databases

These types of online databases are developed by the professional associations or institutions to increase the knowledge of their concerned areas among the people. These associations mainly work for promoting research and developments in their working areas in the broadest manner. They develop different types of information sources to increase dissemination of knowledge related to their concerned areas, including books, journals, reports, and databases. The online databases produced by them are mainly subject specific in nature. Examples are American Psychological Association (PsyInfo) and American Economic Association (EconLit) (Butt *et al.*, 2011).

c. Aggregator Databases

Aggregator databases are defined as the service providers that make available contents, licensed by several publishers and is offered in packages at a single price to libraries. These offer extensive depth and breadth of contents of information along with effective features and functionalities. Examples are ProQuest and EBSCO's (Anasi, 2017)

Search Strategies

Search strategies are combination of different methods used for searching documents and can be identified by types of search methods used and dimensions related to searches such as purpose, type of resources to be searched and methods for searching. According to Larson (2010) “search strategy is a plan for the whole search, while a tactic is a move made to further a search”. Search strategies are the demonstration of patterns used in search processes and for searching the information. Database searching allows users to search information from an organised collection of records. Users can search through by using different moves and tactics to get efficient results. In online

databases, search strategies can be classified in two types, Search and Browsing. These are the main strategies employed by users while communicating with online databases. Browsing needs more interactions with online databases than logic based search strategies use in searching (Kozma, 2014)

Search Methods

Search Methods are defined as methods that assist users in constructing their queries that include two types of searches, viz., basic and advanced searches. All online systems possess these two search methods, which further provide different retrieval techniques, such as Keyword search, Boolean operators, truncation, phrase searching, proximity search and so on for more effective and efficient information retrieval. Search methods include basic or simple search, advanced search, expert search, Citation Locators/ Trackers and browsing (Akpan-Atata & Eugene, 2014).

- **Basic or Simple Search**

It is a commonly used search method in database searching. It is also referred to as keyword searching, as keywords are important words that are used as index to the information in a database. In basic or keyword searching, online database searches the whole document to locate words and phrases defined by the users. Thus, it is useful, when users do not know the exact title or author's name and want to link terms from different parts of a record, such as title, abstract, author etc (Chowdhury, 2010)

- **Advanced Search**

This search provides the following search options:

a. Boolean Operators:

In database searching, Boolean operators are used to narrow or broaden the search. The most useful logical connectors include, AND, OR, NOT. Amongst which AND is used to narrow the search, OR to broaden the scope of search, whereas NOT is use to eliminate unwanted terms from the search. Boolean operators are considered as a common technique for advanced searching. For example:

Online AND Database,

Academic database OR Library database,

Electronic database NOT CD-ROM,

b. Combined Search

This method provides the opportunity to combine two or more Boolean operators in the same search statement. Combined search allows users to search databases by adding different logical operators at the end of each search string. Examples are Online AND Databases NOT Journals.

c. Phrase Searching

Phrase search retrieves exact words in the same order mentioned by a searcher. This feature produces that a result, in which exact phrase is retrieved within a document or any specified field (title, abstract etc.) of documents. It retrieves documents with exact terms adjacent to each other within the same document. Each database provider allows phrase searching as exact word search by using different commands, for examples; the symbols (“ ”, {}) are used for “Online databases” to retrieve all the words in a phrase in an exact order.

d. Field Specific Searches

Field specific searches facilitate users to limit their search terms to a specific field(s) of documents including author, title, abstracts, subjects and volume, etc. Thus it allows users to search within specified fields of recorded documents.

e. Limiters

While searching databases, users are provided the facility to limit their searches by using different types of elements. Limiters constrain a users' query within a specified requirement by imposing limit using specific elements, such as date, type, etc. Almost all the online databases have limiters to control the results by using specified parameters; this retrieval feature is helpful in eliminating records that are outside the scope of defined limits. Users can narrow their searches limiting by date, language, title of article, author(s) of article, subject and limit to a particular journal.

f. Truncation and wildcard

Truncation and wildcard search techniques are used to retrieve variations of a word. In truncation user can enter a base word (prefix) to retrieve all the words beginning with that base term. Generally, these techniques are used to truncate or shorten a word to retrieve singular, plural and its variant spellings. The symbols (*, \$,?) are used to represent truncation in some online databases, while in others these are used to represent wildcard searching. Examples for searching variants of the word politics: poli* (policy, politics, political, politically, etc.)

g. Proximity Search

A proximity search is used for fixing the distance between two words in the same sentence or paragraph of a document. It sets search terms that occur in the same order as

defined by the searcher. Commands used for proximity search include: ADJ, WITH and/or WITHIN and NEAR. For example, the statement STRUCTURE (WITH7) DATABASE indicates that the word STRUCTURE must not be separated from the word DATABASE by more than seven intervening words.

h. Stemming (related terms)

Stemming technique allows searching of all the related variants of a term. It uses the base words of the search term as the stem to retrieve all the related terms as its stem variations. This retrieval feature is presented by many of the online databases but their implementation and interpretation may differ from one another, such as in EI Village and Ovid dollar sign (\$) is required before the search terms, whereas the databases, ACM Digital Library and Emerald automatically stemmed the search terms.

i. Term Boosting

Here, higher importance is assigned to some words to boost their search. Term boosting is the ability used to assign higher weight age to specific words in a query. It provides facility to users to control the significance of a description by boosting its term. A symbol of caret, "^", is used at the end of the term to boost its relevance in retrieved contents. For example: electronic database^4 journal. This reflects that the term electronic database is four times more relevant in a description than journal.

- **Expert Search**

Expert searching implies the application of a range of advanced search skills and knowledge to get more specific information. It allows users to perform more complex and complicated searches in multiple sources simultaneously, which include all sources or journals, books or reference works, etc. With expert search users can enable to

prioritise their search terms to access the most appropriate item of information. The online databases Science Direct and MEDLINE are providing this option for searching.

- **Citation Locators/ Trackers**

Citation Locators enable users to locate any article by entering its details from an article reference or citation. It searches throughout the different fields of a citation including author name, article title, journal title, volume/issue information, year, etc. In case, if an exact match to the citation is not found, then it will retrieve closely matched articles or information. Some of the online databases provide the citation locator or tracker to find, check, and track citations. Citation tracker/locator offers citations to users to provide an overview of how many times a chosen document has been cited in other works and the number of documents that cited it.

- **Browsing**

Browsing is another type of search strategy. It is a process of seeking searching of information by skimming and scanning of contents mainly in leisure. Browsing is exploration of information with a specific goal but without any planned search strategy. It is a technique to look through documents in an informal manner, to search information without any defined purpose, to look and learn new information and to obtain an overview of the information offered by online databases. Browsing is a technique of information retrieval where the initial attempt of searching is usually undefined. While, browsing users do not need to define specific terms as required in the searching, so, it requires less intellect than searching. Irrespective of searching, browsing can be done without any training and practice. Hence, it is a rewarding exercise that is mainly based on serendipity in finding some useful information

unexpectedly, because it is carried out unstructurally. Browsing can be done by using different components of a document, the common browsing options are:

- a. Browse by title of journals. This allows users to browse alphabetical list of journals available in that particular online database.
- b. Browse by keywords which facilitates users to browse different types of collections (journals, books, reviews and reports etc.) available in online databases by using keywords.
- c. Browse by subjects feature allows users to browse contents by subjects.

However, all the online databases are providing this retrieval capability, but differ in implementation of the components used for browsing.

Other Features

Online databases also offer some more retrieval features other than basic, which are discussed below:

Links: This feature helps users in getting full-text items or articles available in other databases or e-journals of the same publisher.

Report: Online databases generate electronic holding reports of an institution. It provides a list of content subscribed by the institution.

Login/ Register: This allows personalization of contents and features of online databases by creating personal account. By this facility users can customise their usage by save searches, subscribe different types of alerts (table of content alerts, favourite topic or journals alerts etc.) through e-mail and create a list of favorite journals, books and topic. Users can also do purchasing of any item of database through their account.

Modify Search: It allows users to modify or change search strategy to get better result. It is done by adding or removing the elements of content for which search is conducted.

Export Data: Users can generate bibliographic data of the article by using different citation manager formats including EndNote, CSV, BibTex and TSV.

News and Updates: Provides information regarding the new launches and acquisitions made by database providers.

Online Databases in Engineering

Online databases are important sources in online collection of libraries. Libraries are acquiring online databases through different sources, such as vendors or intermediaries. In India, UGC INFONET Consortium is the central source of acquiring online databases to the libraries. UGC INFONET Consortium is initiated by the UGC (University Grant Commission). The consortium acts as an intermediary to provide access to scholarly online resources to the academic libraries from reputed publishers, aggregators and society. According to Online Database (2012) consortium covers almost all areas of knowledge, such as Arts, Humanities, Social Sciences, Computer Sciences, Life Sciences, Physical Sciences, Chemical Sciences, Mathematics and Statistics etc.

Online databases that comprises of literature on the Engineering are listed below:

Annual Reviews

Annual Reviews provide researchers, professors, and scientific professionals with a definitive academic resource in 37 scientific disciplines, also covering some areas of social sciences. Annual Reviews provide primary research literature and identifying the principal contributions in the field. It provides access to 33 full text journals and archival access is provided up to 10 years back issues (Anasi *et al.*, 2017)

Cambridge University Press (CUP)

Cambridge University Press is a publisher online database. It is dedicated to advance learning, knowledge and research worldwide, the database currently publishes over 220 peer-reviewed academic journals for the global market, containing the latest research from a broad sweep of subject areas. The CUP database also publishes on behalf of over 100 learned and professional societies. UGC INFONET Digital Library Consortium provides access to 224 Cambridge University Press journals with back files since 1997.

Emerald

Emerald is a publisher-based journal online database, linking research and practice to the benefit of society. The database covers nearly 300 journals and over 2,350 books and book series volumes in business and management, library and information sciences, Engineering and materials science. As the leading publisher database for LIS research, Emerald's Library and Information Studies publications provide comprehensive and quality coverage in all areas of this field. Spanning a range of topics such as collection building to library finances, to document supply and inter-library lending. This is an essential resource for information professionals, librarians, educators, students and researchers around the world. Under UGC INFONET e-journals consortium access is made available for 29 e-journals from Library and Information Science full text database and archival access varies from journal to journal (mostly 2001- onwards).

JSTOR

JSTOR (Journal Storage) is full- text database for scholarship, established in 1995 as digital archives. The majority of content in the archive is journal literature, though inclusion of other materials such as conference proceedings, transactions, pamphlets,

monographs, manuscripts, and other materials is continuously growing. At present, there are 2,000 journals, including previous titles, as well as other content available. New titles and other materials are being added regularly. It provides full text searches of almost 2000 journals.

Oxford University Press (OUP)

Oxford University Press provides access to Oxford Journals. It publishes well over 230 academic and research journals covering a broad range of subject areas. OUP database covers Life Sciences, Mathematics and Physical Sciences, Medicine, Social Sciences, Humanities and Law and include some of the most authoritative journals in these fields. Through UGC INFONET consortium, 198 Oxford University Press journals are available with back files since 1998 to the member libraries.

Project MUSE

Project MUSE is an excellent full-text online database, provides affordable and user-friendly online access to a comprehensive selection of prestigious humanities and social sciences journals. MUSE's online journal collections support a diverse array of research needs at academic, public, special and school libraries worldwide. Its journals are heavily indexed and peer-reviewed, with critically acclaimed articles by the most respected scholars in their fields. MUSE is also the sole source of complete, full-text versions of titles from many of the world's leading university presses and scholarly societies. Currently, MUSE provides full-text access to current content from over 400 titles representing nearly 100 not-for-profit publishers (Larson, 2010)

Science Direct

Science Direct is the world's renowned multidisciplinary online database that publishes over 2,000 journals as well as books and secondary databases. There are currently more than 9.5 million articles or chapters, a content base that is growing at a rate of almost 0.5 million additions per year. It offers subject coverage which broadly includes all aspects of Physical Sciences and Engineering, Life Sciences, Health Sciences, Social Sciences and Humanities. It includes over 2,000 peer-reviewed journals and over 8,057,764 articles. It includes over hundreds of book series, handbooks and reference works and collections that contain 4 million articles prior to 1995, and 2.75 million articles from after 1994 (Kopal, 2015)

Taylor and Francis

It is the oldest commercial journals published in the world. by providing access to its collection online, it comes under the category of a commercial online database. It provides access to more than 1,100 journals and around 1,800 new books that enable the customers and end-users to perform their jobs efficiently, continue their education, and help contribute to the advancement of their chosen profession. It is a widely known online source among researchers, students, academics and increasingly professionals UGC INFONET Consortium access more than 1,365 journals with archival access to 1998 onwards issues. (Kopal, 2015)

Web of Science

The Web of Science provides access to three major databases in Sciences, Social Sciences, Arts and Humanities. It provides seamless access to information from the world's most influential, highly-utilised scholarly literature across a broad range of

topics which covers more than 12,200 of the most prestigious, high impact research journals in the world going back to 1898. With web of Science users can also navigate to electronic full-text journal articles. It also provides a unique search method called cited reference searching. With it, users can navigate forward, backward, and through the literature, searching all disciplines and time spans to uncover all the information relevant to their research (Kopal, 2015)

Wiley Online

Wiley Online is the online database of international scientific, technical, medical and scholarly publishing business of John Wiley & Sons that provides literature in every major academic and professional field. Wiley Online is of the world's foremost academic and professional database. It provides access to more than 1,400 scholarly peer-reviewed journals and an extensive collection of books with global appeal in the life and physical sciences, medicine and allied health, Engineering, humanities and social sciences. The UGC consortium accesses 908 journals from Blackwell publishing with back files since 1997 (Kopal, 2015)

2.1.6 Engineering Skills Acquisition

Industrial stakeholders and development experts in Nigeria have continued to reiterate the need for skills acquisition by the youths as a way to developing more entrepreneurs in the country. These interests advocate for capacity building to go into existing Micro, Small and Medium Enterprises (MSMEs) in order to enhance their productive capabilities for jobs and wealth creation. In an increasingly service-orientated world of work, it is easy to miss the vital role engineers play in transforming lives. Engineering is the crucible in which scientific, mathematic and design skills come together. Engineering is a key part of a range of industries including music, TV and film,

construction, transport, cosmetics, medicine, food and fashion. Overall, the Engineering industry makes up a significant part of Nigeria's economy.

More recently engineers have embraced new technologies and materials to create alternative energy sources, such as, wave power (from the sea) and credit card sized computers that plug straight into your TV (Raspberry Pi). Engineering skills can therefore be transformed into creative and innovative ventures. Businesses have a massive demand for engineers and technicians while Engineering skills are particularly effective when combined with enterprise. Today, Engineering entrepreneurs are changing the world at an unprecedented speed as technology and innovation have never been so important, if not a panacea, for industrial and economic development. Engineers becoming entrepreneurs, in addition to their Engineering, technology and innovative skills, inevitably involve acquiring business, marketing and finance skills (Chowdhury, 2010).

However, in as much as it is desirable and necessary to acquire Engineering skills; for companies to manipulate technology reach new heights, it is equally often necessary to grapple with the often called 'market equation', to manage the challenge of the increasing efficiency of a globalized competitive market, which add up to the important place of entrepreneurial skills in this context. While Engineering skills or acquiring new and innovative human abilities can genuinely lead to increased productivity, we must acknowledge the value of market research, which is about entrepreneurship process, to help steer product development. This thinking underscores the need to narrow the gap between Engineering skills acquisition and entrepreneurship. Engineering skills acquisition can be defined as not just about acquiring skills but acquiring knowledge and driving towards enterprise in skills that enhance personal livelihood through

enduring business startups, enhancing employment opportunities, and promoting economic development and growth.

Though there is something innate in Engineering training that enables the analysis of tradeoffs and a focus on deliverables; this alchemy or chemistry could be more potent when combined with business, and particularly entrepreneurship skills. In fact traits, which are often found among engineers, such as curiosity, creativity and innovation lead to a deeper exploration of entrepreneurship, the encouragement, especially among the younger generation, to pursue successful futures (Rouse, 2016)

Engineering students appear to be confronted with obsolete training equipment. Laboratories evidently are either not well equipped or are unable to meet modern standards in a context in which the world is embracing a knowledge-based economy (Adeodu, *et al.*, 2017). Hence, the question has often remained: how do we introduce these concepts and the accompanying commercial skills in our university programs? In Nigeria one evident attempt by the government in this direction was the introduction of Technical vocational education and training (TVET), which plays an important role in shaping a nation's intellectual human capital. In today's world, TVET has undergone several transformations in fulfilling its tasks to produce excellent, competitive and skillsful human capital. More than ever before, the need for well trained and skilled workers to meet the technological demands of the country's developing economy has become more apparent. In 1973 the Industrial Training Fund (I.T.F) initiated the Students Industrial Work Experience Scheme (SIWES), which was aimed at helping students undergoing courses in Engineering and technology and other professional courses to acquire the necessary practical knowledge in industry in addition to the theoretical knowledge gained in the classroom. However, that school-industry partnership which ought to be the bedrock of technical development and innovations for

the country has not been developed or established. This Engineering/technological and industrial skills gap increased in a context in which academic institutions placed much emphasis on the theoretical training rather than practical applications of the training (Nnadi, 2014) even as industries failed to participate in the educational programs due to the fact that some industries do not realize the intimate relationship between productivity, quality and education or training. The education system seems to produce many graduates with no technical skills to fit into the industrial sector, which nevertheless has room for expansion. It is therefore imperative to ensure government/public support for sustainable cooperation with the industry for enhanced skills-acquisition.

2.2 Theoretical Framework

2.2.1 Social Learning Theory (SLT)

Social learning theory is increasingly cited as an essential component of sustainable natural resource management and the promotion of desirable behavioural change. (Muro and Jeffrey 2008). This theory is based on the idea that we learn from our interactions with others in a social context. Separately, by observing the behaviors of others, people develop similar behaviors. After observing the behavior of others, people assimilate and imitate that behavior, especially if their observational experiences are positive ones or include rewards related to the observed behavior. According to Bandura (1977), imitation involves the actual reproduction of observed motor activities (Mcleod, 2015).

SLT has become perhaps the most influential theory of learning and development. It is rooted in many of the basic concepts of traditional learning theory. This theory has often been called a bridge between behaviorist learning theories and cognitive learning theories because it encompasses attention, memory, and motivation (Vollmer, 2010).

However, on this regards, Bandura (1977) believes that direct reinforcement could not account for all types of learning. For that reason, in his theory he added a social element, arguing that people can learn new information and behaviors by watching other people. According to the elements of this theory there are three general principles for learning from each other.

i. General principles of Social Learning Theory

The principles of social learning are assumed to operate in the same way throughout lifetime. Observational learning may take place at any age. In-so-far as exposure to new influential, powerful models that control resources may occur at life stage, new learning through the modeling process is always possible.

SLT posits that people learn from one another, via: observation, imitation and modeling.

Based on these general principles, learning can occur without a change in behavior. In other words, behaviorists say that learning has to be represented by a permanent change in behavior; while in contrast social learning theorists say that because people can learn through observation alone, their learning may not necessarily be shown in their performance (Bandura, 1977). Learning may or may not result in a behavior change. Bandura (1977) demonstrated that cognition plays a role in learning and over the last 30 years social learning theory has become increasingly cognitive in its interpretation of human learning.

ii. Behaviors learned through modeling

The people who are being observed are called models and the process of learning is called modeling. Bandura (1977) stated that second and third stages of social learning, imitation and behavior modeling, will occur if a person observes positive, desired

outcomes in the first stage. If, for example, an instructor attends and observes a course in-world and is entertained, informed and approves of the way students act, they are more likely to want to teach a course in-world themselves. They can then use the behavior they experienced to imitate and model other instructors' teaching styles in-world (Bandura, 1977)

Previous studies confirmed that at least partly of many behaviors can be learned through modeling. Some examples that can be cited in this regard are, students can watch parents read, students can watch the demonstrations of mathematics problems, or seen someone acting bravely and a fearful situation. Based on this point, aggression can also be learned through models. Much research indicates that children become more aggressive when they observed aggressive or violent models. From this view, moral thinking and moral behavior are influenced by observation and modeling. In consequence, learning includes moral judgments regarding right and wrong which can in part, develop through modeling (Mcleod, 2015)

iii. Social Learning Theory Concepts

Based on the literature, there are three concepts in SLT. Firstly, people can learn through observation which is known as observational learning. Secondly, mental states are important factor for learning, it is also named as intrinsic reinforcement. Finally, it refers to this point that learning does not necessarily lead to a change in behavior and it follows by modeling process.

iv. Observational Learning

In 1965 Bandura conducted his famous experiment known as the Bobo doll experiment, to study patterns of behaviour, at least in part, by social learning theory, and that similar behaviours were learned by individuals shaping their own behaviour after the actions of

models. The study was significant because it departed from behaviorism's insistence that all behaviour is directed by reinforcement or rewards. The children received no encouragement or incentives to beat up the doll; they were simply imitating the behaviour they had observed. Bandura termed this phenomenon observational learning and characterised the elements of effective observational learning as attention, retention, reciprocation and motivation. He demonstrated that children learn and imitate behaviors which they have observed in other people. On this process, he identified three basic models of observational learning:

1. A live model, which involves an actual individual demonstrating or acting out a behaviour.
2. A verbal instructional model, which involves descriptions and explanations of a behaviour.
3. A symbolic model, which involves real or fictional characters displaying behaviours in books, films, television programs, or online media.

v. Intrinsic Reinforcement

One of the other formats of learning is described as a form of internal reward, such as pride, satisfaction, and a sense of accomplishment. Bandura (1965) SLT concepts emphasis on internal thoughts and cognitions and it can help connect learning theories to cognitive developmental theories. On this regards, Bandura (1965), criticized this process and believed that external, environmental reinforcement is not the only factor to influence learning and behavior.

vi. Internal principle of Social Learning Theory

People are only partial products of their environments. Just as important is the fact that we create beneficial environments and then proceed to exercise control over them. By selecting environments carefully, we can influence what we become. Our choices are influenced by our beliefs as well as our capabilities. Bandura (1965) proposes only a single internal principle comprised of three interacting elements. This principle is termed triadic reciprocity. Some scholars in the area of SCLT like Betz (2007) and Green and Peil (2009) supported Bandura's view of triadic reciprocity and define human behaviour as a triadic, dynamic, and reciprocal interaction of personal factors, behaviour, and the environment. On a closer observation, these three fundamentals work in a reciprocal nature. Figure 2.1 shows these principles more clearly(Mcleod, 2015).

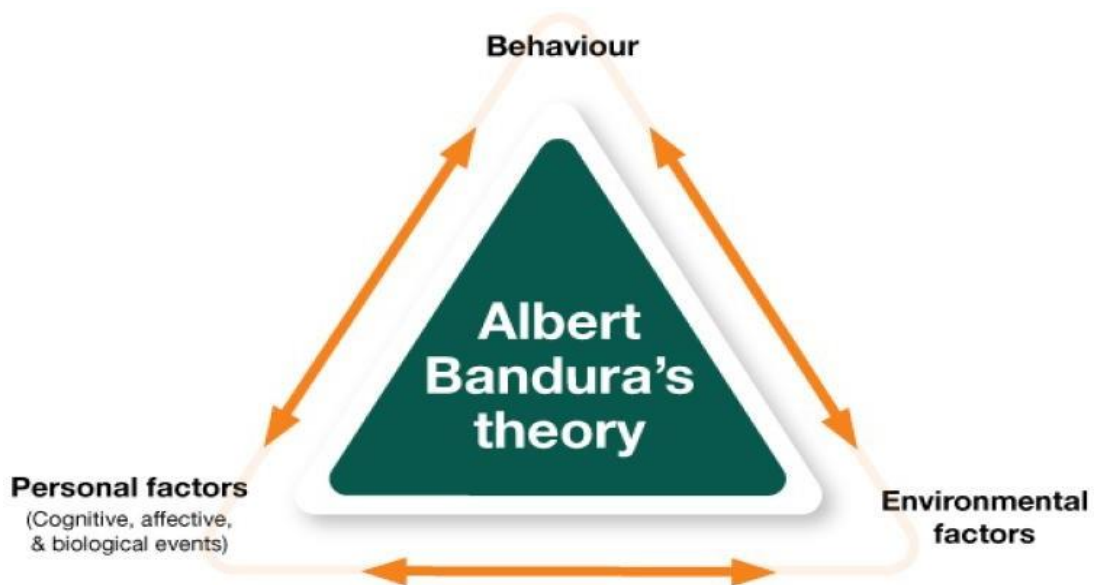


Figure 2.1: Internal principle of SLT

This theory relates to this research in the area of scope.

2.3 Empirical Studies

Kpakiko *et al.* (2018) examined the extent Current Awareness Services have influenced the use and access to information resources by the users of university libraries in North-Central Nigeria. Descriptive survey research approach was used. A Sample of library users from three university libraries in North Western Nigeria was used. Copies of the questionnaire were administered on the library users (students and staff) to collect data on the awareness and use of current awareness services in the library. The data collected were analyzed using table and simple percentage calculation. It was discovered that, users visit the library daily in order to read, carryout research and update their knowledge. Again, list of new arrivals, shelve display, library bulletin newspaper and email and bulletin board services were the most available current awareness services in the library and mostly used. The study suggested that the adoption of digital technologies in university libraries will enhance timely distribution of information needs of the users. The study therefore, encouraged the library users to acquire ICT skills which will enable them adequately utilize digital current awareness service tools. This study is related to the present in the area of population studied and the independent variable. In addition, as stated in this research, an effective current awareness service would bring about an effective information dissemination and access. However, unlike this research, questionnaires were administered to the staff of the studied library.

Cabonero *et al.* (2019) evaluated the effectiveness, reasons and problems in current awareness services in an academic library towards crafting an action plan. Information is a very essential component in research but it can only be used when provided with access. Researchers are overwhelmed with overflowing information and they are sometimes prone to plagiarised articles, predatory journals and fake news articles. Moreover, they experienced information explosion due to rapid developments of

information and communications technologies. Thus, library researchers need to be informed with updated publications and other information resources. Librarians then should be more proactive in providing them access such as the current awareness services (CAS) which is one of the important library services for fast and easy retrieval and dissemination of information. Quantitative and qualitative methods of research were used to determine the level of effectiveness, reasons, and problems encountered in the current awareness services of Saint Mary's University Learning Resource Center, Canada. Results revealed that the level of effectiveness on current awareness services was high because it was used to: (1) update users for the current information; (2) provide quick information needed by the users; (3) help researchers in the pursuit of their studies and (4) provide awareness/assistance to the faculty and students. The problems encountered in the implementation of CAS were focused on up-to-datedness, regularity of postings, attractiveness and design, quality of information and location of the bulletin board, and design, up-to-datedness, quality of information and provision of copies of the library publications.

This study is related to the present study in the area of title, just like this research, the study highlighted the fact that current awareness services helps in providing quick access to information, help researchers in accessing quick information, and help users in accessing current information. However, the problems of current awareness services were not detailed out.

Ogbu (2015) examined the impact of students' industrial work experience scheme (SIWES) on electrical technology education students' skills acquisition in Ebonyi State University, Nigeria. Two research questions and two hypotheses guided the study. It was a survey research design and the entire population of electrical technology education lecturers and SIWES students were used, being a total number of 56. No

sampling was carried out due to the handle-able size of the population. A structured and face validated questionnaire was used for data collection with the computed coefficient of stability being 0.97. The research questions were answered with mean and standard deviation, while the hypotheses were tested with student's t-test statistic at 0.05 level of significance. Fifteen major electrical practical skills were found to be impacted by SIWES together with twenty good work habit, public relations and social services skills. This study is related to the present research in the area of title. Just like this research, the empirical study also examines how skills acquisition can be greatly improved by a number of factors. However, the scope is not the same as the current research.

Similarly, Eze (2016) examined the influence of educational technology centres on students' skills acquisition in Ebonyi State University, Nigeria. The aim of educational technology is to improve the competence of teachers by producing teachers that can back theory with practice in teaching-learning situation. The study focused on the influence of educational technology centres on students' skills acquisition for self-employment. The study was carried out in Ebonyi State University, Faculty of Education and six research questions were formulated to guide the study. The study adopted cross sectional research design 235 served as sample size for the study. Reliability coefficient of 0.71 was obtained. Data collected were analyzed using mean and standard deviation. It was found among other thing that educational technology centres provide skills in caring to students for self-employment etc. Conclusion was drawn and recommendation made. This study is related to the present study in the area of methodology and the dependent variable however, unlike this study, the present research was carried out in federal universities in North Central Nigeria. In addition, this present research focused on skills acquisition of undergraduate Engineering students.

Aneke and Ezugwu (2018) examined skills acquisition: An E-learning approach in University of Nigeria, Nsukka. The study showed that the Government and individuals, both in the past and present have designed skills acquisition programmes that seem not to be impacting much on the youths due to problem of low self-esteem, master-apprentice gap, abuse and some other ugly experiences youths encounter in the course of their training. Experimental methodology was used to demonstrate that skills can be acquired from the comfort of the trainee's home as long as there is availability of internet service, the trainee does not need any formal education to qualify but it can be an advantage. Due to the lapses exposed by this study, it is clear that libraries can play vital roles in skills acquisition among undergraduate Engineering students. The library is an institution where youths can acquire knowledge without fear of being bullied, punished, abuse and so on. This study is related to the present study in the title. The study varies from the present research in the area of methodology. Experimental methodology was used for the research unlike the present research where the use of questionnaires and observation checklist were used.

Okwelle and Ojotule (2018) investigated some constraints to students' effectiveness in practical skills acquisition in technical colleges in Kogi State. Descriptive survey design was adopted in the study. The population of the study comprised 286 final year students and 47 technical teachers from the five Government Technical Colleges in Kogi State. A sample size of 245 (198 students and 47 teachers) was used for the study. Simple random sampling technique was employed in the selection of the students. But for the teachers all the 47 of the VOC III teachers were used. Two research questions were answered and two hypotheses tested at 0.05 level of significance. The instrument used for the study was a structured questionnaire validated by three experts and reliability tested through the use of Pearson Product Moment Correlation to obtain a reliability

coefficient of 0.92. Mean was used to answer the research questions while the hypotheses were tested with Z-test. The study revealed that some of the problems constraining acquisition of practical skills by students of technical colleges in Kogi State included difficulties in Student Industrial Work Experience Scheme (SIWES) participation and inadequate workshop facilities. Based on the findings, it was recommended among others that an institution be established by the government through the Ministry of Education solely for the affairs of SIWES in which students enroll, participate and certified as a “must” requirement before graduation from technical colleges. Also, yearly accreditation of the colleges by the relevant agencies, to ascertain the adequacy of the workshop facilities was recommended. This study is related to the present study in the area of title. Just like this research, the current research also examined the constraints to skills acquisition. However, the findings from the current research on the problems of skills acquisition greatly varies from this research.

Akpo and Oliver (2019) determined the influence of institutional variables on employability skills acquisition among Business Education students in tertiary institutions in Cross River State, Nigeria. Survey research design was employed in carrying out the study. Data were collected using a researcher-made questionnaire which was validated by two Vocational Educators and an expert in Measurement and Evaluation. A reliability estimate of 0.80, 0.81 and 0.87 was achieved for the research variables using Cronbach Alpha Statistical Analysis, after a trial test was conducted using 20 final year Business Education students in University of Uyo who did not form part of the main study sample. The questionnaire was administered to 400 final year Business Education students using stratified and accidental sampling techniques. Data analysis was done, while two (2) hypotheses were formulated and tested for significance

using Simple Linear Regression Statistical Technique. Analyzed data were presented in form of tables and the results revealed that there is significant influence of classroom climate and instructional method on employability skills acquisition among Business Education Students. Based on the findings of the study, it was recommended among others that the teacher should always utilize practical method of instruction that can help the students concretize what they learn and apply it in real life situation as learnt. This study is related to the present research in the area of methodology used. Just like the present research, structured questionnaires were administered. However, unlike this research, the present research did not capture feedback from lecturers in the universities studied.

Ngessa (2018) examined user challenges for the commonly used online database systems in Higher Education Institutions in Tanzania (HEIs). Two research objectives were formulated as a means to guide and meet the objectives of the study. The study adopted a case study with both quantitative and qualitative methods approach in which a survey was run across 12 HEIs in Tanzania. In order to draw a representative sample of the population, a simple random sampling strategy was adopted in which all participants were given equal chance of being selected. As a result, a total of 559 students, and 149 academic staff participated in the study. The major findings showed that Wiley online library, Google Scholar, Science Direct and JSTOR are the commonly used databases but the level of access is very low (mostly to students) due to internal and external challenges like slow Internet connection, the difficulty of using online databases, unavailability of online databases, and poor financial support. The overwhelming evidence collected from the survey suggested that HEIs ought to do enough to ensure the value for money on the subscribed online resources. This study is related to the present study in the area of the title. However, the present research did not examine in

details the challenges encountered in the use of online databases. Inclusively, this research was carried out in Tanzania unlike the present research.

Mery et al. (2014) evaluated the effectiveness of tools for online database instruction. Ninety undergraduate students were randomly assigned into three groups: group 1 completed a GotS tutorial; group 2 viewed a screencast presenting identical content; and a control group. Each group completed an identical 16-item post-test. An analysis of variance revealed statistically significant differences between the control group and both treatment groups; however, there was no statistical difference between treatment groups. Limitations of the study and future research areas are also discussed. This study is related to the present study in the area of title. However, the researcher in the present research did not distribute the respondents into different focus groups.

Ifukor (2013) examined the channels of information acquisition and dissemination among the rural dwellers. The descriptive research was employed for the study. It revealed that: town-criers, marketplaces, socio-political meetings, traditional festival, role play, songs and dance, demonstration, lecture and exhibition, GSM handsets, television, radio, and newspapers are channels of information that are used to acquire and disseminate information among rural dwellers. The study recommended among others that the indigenous languages should be used for radio and television news to enable rural dwellers understand the message better since study has shown that many rural people cannot read or write; that modern and traditional information acquisition and dissemination channels should be used by information agent working in the rural areas; that further study should be carried out to discover the best acceptable channels to each categories of rural people. This study is related to the present study in the area of the title. However, unlike this research, the present research did not examine pyroquial

methods of information dissemination and the present research did not capture the methods of information acquisition.

Conde-Caballero *et al.* (2019) evaluated blogging as a tool for the acquisition and dissemination of knowledge in health sciences: a preliminary evaluation. Tools for online collaboration are becoming increasingly prevalent in recent years. Certain characteristics of these tools encourage this proliferation: they are easy to use, always available, allow information to be built collaboratively and disseminated quickly through social networks, and are usually free of charge. The possibility to subscribe to blogs and their availability in formats adaptable to mobile devices mean their content can be taken anywhere. Although the use of blogs is well-established among Health Science professionals, their use among university professors as a component of the teaching strategies in these disciplines is much less common, and thus the benefits, risks and limitations of using blogging as a pedagogical tool are poorly understood. However, the challenges and inconveniences are also highlighted; these are principally the lack of motivation and the low participation of the students. By analysing the outcomes of this preliminary evaluation of a pedagogy, it is concluded that blogs are a very useful tool, although it is suggested that the literature shows a certain bias toward the publication of successful trials. This study is related to the present study in the area of the title. However, the present research did not capture information acquisition. Also, the scope of the present study was undergraduate Engineering students and not health science professionals.

Ntlotlang and Grand (2016) investigated the role of public libraries in the dissemination of health information in the southern part of Botswana, namely, Kgatleng and Kweneng districts. It also explored how these libraries market health information services to the community they serve. The study also used health information acquisition model to get

an understanding on how public library users seek health information. Survey research design was chosen for the study and purposive sampling procedure was used to obtain the sample size of the population. The sample size consisted of 120 respondents and six interviewees. Data were collected from both library staff and users using questionnaires and interviews. The results of the study showed that public libraries are striving to provide accurate and useful health information to members of the community by collecting and availing both print and electronic health information sources. The findings further indicated that public libraries have marketing programmes that they use on raising awareness of health information to their clientele. The marketing programmes include outreach, library brochures/leaflets, newsletters and library exhibitions. The results of the study also showed that there were some challenges that hindered the library users to access and use health information (e.g. lack of appropriateness of information resources and limited number of health information sources). For a better dissemination of health information, public libraries should establish working relationships with health agencies and communication organisations or media houses with the objective of cooperative developments of collections, referrals and shared training. This study is related to the present study in the area of methodology. However the type of library examined in the present research were academic libraries and not public libraries.

2.4 Summary of Literature Reviewed

The study reviewed relevant information resources on concept of information dissemination, current awareness services, online databases and skills acquisition by undergraduate Engineering students. The study also reviewed relevant literature on types of databases, searching techniques, methods of information dissemination, and current awareness services. The study adopted Social Learning Theory by Bandura

(1965 and 1977) on how Engineering undergraduate students acquire pertinent skills using their environment and leading to a change of behaviour.

The study also carried out empirical review of related literature. The study revealed that most of the past studies were on challenges associated with skills acquisition by Engineering undergraduate students, employability skills among Engineering students, how institutional variables has affected their skills acquisition and how current awareness has affected information accessibility and use.

The study reviewed information dissemination and Current Awareness Services to undergraduate Engineering students by libraries. It also reviewed dissemination of Engineering information as well as Engineering skills acquisition for undergraduate Engineering students in North Central Nigeria. The researcher, from the literature reviewed observed that none of the studies reviewed has investigated the information dissemination, Current Awareness Services as well as online database services in relation to skills acquisition in North Central, Nigeria and that is the gap this study is designed to fill in literature.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The study adopted survey research design. This is because survey research design has the advantage of wider application as it allows data to be collected on a large population. Cherry (2009) defined survey research design method as a data collection tool used to gather information about individuals. This method allows for the selection of random samples from large and small population to obtain empirical knowledge of a present nature. It is less expensive than many other data collection techniques. More importantly, survey method can be used to collect information on a wide range of things, including personal, facts, attitudes, past behaviours and opinions. The survey research design was relevant for this study because it was relatively cheap and served as a fast way of collecting information and data on information dissemination, current awareness services and online databases obtained in libraries.

3.2 Population of the Study

The population of the study was 9,800 undergraduate Engineering students, comprising undergraduate students in the Federal University of Technology, Minna, University of Abuja, Federal University Lokoja, Federal University, Lafia, University of Ilorin, University of Jos, Federal University of Health Sciences, Otuipo and Federal University of Agriculture, Benue. Data from Federal University of Health Sciences, Otuipo was not captured in this research because it is a new University. Table 3.1 shows the breakdown of the population.

Table 3.1: Population of the Study

S/N	Name of Federal University	Departments	Year of Establishment	Number of Students
1	Federal University, Lokoja	Civil Engineering, Electrical and Electronics Engineering and Mechanical Engineering	2011	1250
2	Federal University of Agriculture, Makurdi	Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering	1988	1450
3	Federal University of Technology, Minna	Mechanical Engineering, Civil Engineering, Computer Engineering, Telecommunication Engineering, Mechatronics, Electrical Engineering, Chemical Engineering and Agricultural Engineering.	1983	2700
4	University of Abuja	Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Chemical Engineering	1988	1400
5	University of Ilorin	Biomedical Engineering, Chemical Engineering, Water and Environmental Engineering, Mechanical Engineering, Polymer Engineering, Electrical Engineering, Agricultural and Biosystems Engineering, Metallurgical and Materials Engineering	1975	1900
6	University of Jos	Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering and Mining Engineering	1977	1100
7	Federal University of Health Sciences, Otukpo		2018	Nil
	Total			9800

Source: The institutions' websites

3.3 Sample and Sampling Techniques

The sample size of the study was 370 Engineering students. Random sampling technique was used in selecting the sample size. The sample size was determined using Krejcie and Morgan (1970) recommended Table for determining sample size of a population, where it is recommended that, for a population of 200, sample size of 50 should be selected and for a population of 500, 100 sample size should be selected for the study. Therefore, for a population of 9,800, a sample size of 370 is adequate for the study. A sample size of 370 was obtained from 9,800 at a level of confidence of 97% and at margin error of 0.5. The researcher used random sampling technique to select 370 out of the 9,800-target population of undergraduate Engineering students in federal universities in North Central, Nigeria.

The idea of sampling was to obtain a part of the population from which some information of the entire population can be inferred or generalized. A sample is a subset drawn to represent the relevant attributes of the whole set, such as individuals, objects or events.

The sample size was distributed using the formula 1000 divided by the population of the study and the result multiplied by 370 as shown in Table 3.2.

Table 3.2: Sample Size of the Study

S/N	Name of Federal University	Sample
1.	Federal University, Lokoja	45
2.	Federal University of Agriculture, Makurdi	60
3.	Federal University of Technology, Minna	85
4.	University of Abuja (Uni Abuja)	60
5.	University of Ilorin(Uni Ilorin)	70
6.	University of Jos (Uni Jos)	50
	Total	370

3.4 Instruments for Data Collection

The research instruments used in collecting data for the study were the questionnaire and observation checklist. The purpose of using questionnaire was to enable the respondents express their opinions for the study and the observation checklist was used for proper identification of the resources and services available in the study areas. Questionnaire is the most appropriate instrument that will be used for the study because it is easy to administer and data can be collected within a very short timeframe.

A self-designed closed ended structured questionnaire titled "Information Dissemination, Current Awareness Services and Online Databases in Libraries as Facilitators of Undergraduate Engineering Students for Skills Acquisition in North Central, Nigeria." (IDCASODLFUESSA) Was used for the study. Respondents were offered set of answers in order to choose the one that most closely represent their views. Section 'A' of the questionnaire contained demographic data of the students such as department, level, age and so on. Section 'B' contained information on the availability of online databases in libraries for skills acquisition. Section 'C' contained information on methods used for information dissemination, current awareness services and online databases in libraries for skills acquisition. Section 'D' contained information on the relationship that exists between information dissemination and skills acquisition. Section 'E', likewise, contained information on the link that exists between current awareness services and information dissemination. Section 'F' contained information on the relationship that exists between online databases and skills acquisition. Section 'G' contained information that covers the factors militating against skills acquisition of undergraduate Engineering students in libraries of federal universities in North Central, Nigeria.

Observation instrument will be used to assess the level of current awareness services and online databases available for library services.

3.5 Validity of Research Instruments

The questionnaire and the observation checklist was validated with the help of the researcher's supervisor. Necessary inputs, observations and comments were made in order to arrive at a valid measure on all the relevant concepts of the study. Furthermore, to ensure the face and content validity of the instrument, it was also be given to two lecturers in the Library and Information Technology (LIT) Department and one analyst for their inputs. The supervisor's constructive criticisms as well as that of the other lecturers served as improvement of items in the format of the research instruments.

3.6 Reliability of Research Instruments

To further validate the questionnaire instrument, the modified instrument was administered as a pre-test using split-half method. A pilot study was conducted in Ahmadu Bello University (ABU) Zaria, where fifty (50) copies of the questionnaire were administered to the undergraduate Engineering students in the institution to determine the level of its reliability. The reliability coefficient after the analysis was found to be 0.761, using the Cronbach Coefficient Alpha formula.

3.7 Procedure for Data Collection

The researcher collected a letter of introduction from the Head of Department, Library and Information Technology, Federal University of Technology, Minna to the seven federal universities in North Central, Nigeria. The letter was attached to the copies of the questionnaire administered. The researcher co-opted one research assistant in each of the universities to collect the data for the study. In each school and department visited, the class representatives helped in collecting the data from the students when

filled and returned the questionnaire. The researcher spent two months to collect data for the study.

The observation checklist was used to check the level of CAS provided in the library as well as the types of online databases available for Engineering students in the libraries.

3.8 Method of Data Analysis

To enable the researcher analyze the data adequately, descriptive and inferential statistical tools were adopted for analysis. Frequency distribution, mean and percentages were used for descriptive analysis, while Pearson Product Moment Correlation (PPMC) descriptive statistical tool was used to test the null hypotheses in the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 This chapter presents a tabular representation of data obtained from field and their discussion.

4.1 Response Rate

A total of three hundred and seventy (370) copies of the questionnaire were administered to students in Federal University Lokoja, Kogi State; Federal University of Agriculture Makurdi, Benue State; Federal University of Technology Minna, Niger State; University of Abuja, FCT; University of Ilorin, Kwara State and University of Jos, Plateau State. Three hundred and eleven (311) copies of questionnaire were filled, returned and found usable representing 84% response rate. Table 4.1 shows the breakdown of the response rate.

Table 4.1: Response Rate

S/No	Name of Institution	No of Administered Questionnaire	No of Returned Questionnaire	Percentages (%) of Returned Questionnaire
1	Federal University of Agriculture, Makurdi	60	50	13
2	Federal University , Lokoja	45	33	19
3	Federal University of Technology, Minna	85	73	19
4	University of Abuja	60	51	14
5	University of Ilorin	70	65	18
6	University of Jos	50	39	11
Total		370	311	94

Table 4.1 above shows that 32 (19%) of the questionnaires were returned from Federal University Lokoja, 49 (13%) were returned from Federal University, of Agriculture Makurdi and 72 (19%) were retrieved from the Federal University of Technology, Minna. Likewise, 51 (14%) of the questionnaires were retrieved from University of Abuja, 65 (18%) were retrieved from University of Ilorin and 39 (11%) were retrieved from University of Jos.

4.2 Demographic Representation of the Respondents

The breakdown of the demographic of the respondents are represented in Tables 4.2.1, 4.2.2, and 4.2.3.

Table 4.2.1: Distribution of Respondents According to Gender

S/N	Gender	Frequency	Percentage
1	Male	217	70
2	Female	94	30
	Total	311	100

Table 4.2.1 indicated that 217(70%) of the respondents were males, while 94(30%) of them were females. This implies that the males are mostly involved in engineering program in the universities studied.

Table 4.2.2: Distribution of Respondents by Level of Study

S/N	Level	Frequency	Percentage
1	100	26	8
2	200	74	24
3	300	102	33
4	400	44	14
5	500	65	21
	TOTAL	311	100

Table 4.2.2 revealed that majority of the respondents 102 (33%) were 300L students, followed by 200 level students with a frequency of 74 (24%) and 500 level students with a frequency of 65 (21%). This was a deliberate arrangement by the researcher because it is believed that undergraduates within this level use the libraries the most as compared to 100L undergraduates who are freshers, with a frequency of 26 (8%) and 400 level students with a frequency of 44 (14%).

Table 4.2.3: Distribution of Respondents by Department

S/N	Level	Frequency	Percentage
1	Civil	77	25
2	Mechanical	69	22
3	Electrical/Electronics	58	18
4	Computer Engineering	44	14
5	Telecommunication	14	4
6	Agriculture and Bioresources engineering	18	6
7	Mechatronics	7	2
8	Biomedical engineering	4	2
9	Metallurgical and Materials engineering	11	4
10	Water and Environmental engineering,	9	3
	TOTAL	311	100

The table above reveals that Civil Engineering has the highest number of respondents, with a frequency of 77 (25%). This is followed by Mechanical Engineering with 69 (22%), Electrical/Electronics Engineering with 58 (18%), Computer Engineering with 44 (14%), Telecommunications Engineering with 14 (4%), Agriculture and

Bioresources Engineering with 18 (6%), Metallurgical and Materials Engineering with 11(4%) and lastly, Water and Environmental Engineering with 9 (3%).

4.3 Research question 1: What are the available information resources that satisfy the information needs of theology students studied?

Table 4. 3: Available Databases in the Institutions Studied

S/N	DATABASES	FUL	FUAM	FUTMX	UNIABJ	UNIJOS	UNILORIN	Total
1.	ProQuest	NA	A	A	NA	A	NA	3
2.	JSTOR	A	NA	NA	NA	A	A	3
3.	Elsivier Science Direct	A	NA	A	A	A	A	5
4.	OMICS International	NA	NA	NA	NA	NA	A	1
5.	IEEE explore digital library	NA	NA	A	NA	A	A	3
7.	Oxford Academic Journal	NA	NA	NA	NA	NA	A	1
8.	Ebsco-host	A	NA	A	A	A	A	5
9.	OARE	A	NA	A	A	A	NA	4
10.	ACM Digital Library (DL)	NA	NA	NA	NA	A	NA	1
11.	BioOne Online Journal Library	NA	NA	NA	NA	A	NA	1
12.	IMF eLibrary	NA	NA	NA	NA	A	NA	1
13.	QUESTIA	NA	A	NA	NA	A	NA	2
14.	TEEAL Databases	NA	A	NA	NA	A	NA	2
15.	GOALI	NA	A	NA	NA	NA	NA	1
16.	E-granary	NA	A	NA	NA	NA	NA	1
17.	DATAD	NA	NA	NA	NA	A	NA	1
18.	AGORA	NA	A	A	NA	NA	NA	2
19.	HINARI	A	A	A	A	NA	NA	4
20.	DOAJ	NA	NA	NA	A	NA	NA	1
21.	AJOL	NA	A	A	A	NA	NA	3
22.	Jgateplus	NA	NA	NA	A	NA	NA	1
23.	National Academics of Science, Engineering and Medicine	NA	A	NA	NA	NA	A	2
24.	CORE	NA	NA	A	A	A	NA	2
	Total	5	8	9	8	13	4	

KEY: A= AVAILABLE; NA= NOT AVAILABLE.

Table 4.3 reveals the available databases available in federal universities in North Central Nigeria. From the Table, proquest database is used in 3 universities, JStor in 3, Elsevier, Science Direct in 5, OMICS international in 1, IEEE digital library in 3, Oxford Academic Journal in 1, Ebsco-host in 5, OARE in 4, ACM Digital library in 1, BioOne online journal Library in 1, IMF elibrary in 1, QUESTIA in 2, TEEAL database in 2, GOALI in 1, E-granary in 1, DATAD in 1, AGORA in 2, HINARY in 4, DOAJ in 4, AJOL in 3, Jgateplus in 1, NASEM in 2, CORE in 2.

Similarly, Table above also captures the number of databases available in each of the universities studied. Thus, Federal University, Lokoja has 5 online databases actively in use, Federal University of Agriculture, Makurdi, Federal University of Technology, Minna and University of Abuja all have 8 online databases actively available, University of Jos boasts of 13 online databases and Uni Ilorin prides itself with 7.

Research question 2: Level of skills acquisition

Table 4.4: Level of skills acquisition

FUL								
S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	N	\bar{x}	StD
1	My level of entrepreneurial skills has improved through the provision of online databases	3(9.4)	25(78.1)	4(12.5)	0	32	2.97	47
2	My level of curiosity skills has improved through the provision of library services.	1(3.1)	26(81.3)	4(12.5)	1(3.1)	32	2.84	51
3	My level of creativity skills has improved through the provision of CAS in the library	2(6.3)	26(81.3)	4(12.5)	0	32	2.94	44
4	My level of innovation skills has improved through the availability of online databases	3(9.4)	23(71.9)	6(18.8)	0	32	2.91	0.09
5	My level of technology skills has improved through information dissemination services	2(6.3)	22(68.8)	8(25.0)	0	32	2.81	53
6	My level of acquiring knowledge has improved	1(3.2)	21(67.7)	9(29.0)	0	32	2.74	51

7	through information dissemination services My driving towards enterprise has improved through CAS in the library	1(3.1)	19(51.4)	12(37.5)	0	32	2.66	54
	Weighted mean						2.83	
	Decision							High

FUAM

S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My level of entrepreneurial skills has improved through the provision of online databases	6(12.2)	39(79.6)	0	4(8.2)	49	2.96	0.67
2	My level of curiosity skills has improved through the provision of library services.	4(8.2)	39(79.6)	2(4.1)	4(8.2)	49	2.88	0.66
3	My level of creativity skills has improved through the provision of CAS in the library	3(6.1)	31(63.3)	8(16.3)	7(14.3)	49	2.61	0.81
4	My level of innovation skills has improved through the availability of online databases	7(14.3)	32(65.3)	6(12.2)	4(8.2)	49	2.86	0.76
5	My level of technology skills has improved through information dissemination services	5(10.2)	27(55.1)	10(20.4)	7(14.3)	49	2.61	0.86
6	My level of acquiring knowledge has improved through information dissemination services	3(6.1)	24(49.0)	14(28.6)	8(16.3)	49	2.45	0.84
7	My driving towards enterprise has improved through CAS in the library	4(8.2)	25(51.0)	16(32.7)	4(8.2)	49	2.59	0.76
	Weighted mean						2.77	
	Decision							High

FUT, Minna

S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My level of entrepreneurial skills has improved through the provision of online databases	10(13.9)	39(54.2)	12(16.7)	11(15.3)	72	2.67	0.90
2	My level of curiosity skills has improved through the provision of library services.	6(8.3)	49(68.1)	11(15.3)	6(8.3)	72	2.76	0.72
3	My level of creativity skills has	9(12.5)	48(66.7)	5(6.9)	10(13.9)	72	2.78	0.84

4	improved through the provision of CAS in the library My level of innovation skills has improved through the availability of online databases	7(9.7)	38(52.8)	21(29.2)	6(8.3)	72	2.64	0.78
5	My level of technology skills has improved through information dissemination services	6(8.3)	39(54.2)	20(27.8)	7(9.7)	72	2.61	0.78
6	My level of acquiring knowledge has improved through information dissemination services	6(8.3)	41(56.9)	14(19.4)	11(15.3)	72	2.58	0.85
7	My driving towards enterprise has improved through CAS in the library	6(8.3)	29(40.3)	23(31.9)	14(19.4)	72	2.38	0.89
	Weighted mean						2.63	
	Decision							High

Uni Abuja

S/NO	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My level of entrepreneurial skills has improved through the provision of online databases	14(27.5)	22(43.1)	10(9.6)	5(9.8)	51	2.88	0.93
2	My level of curiosity skills has improved through the provision of library services.	9(17.6)	14(27.5)	8(15.7)	20(39.2)	51	2.24	1.16
3	My level of creativity skills has improved through the provision of CAS in the library	5(9.8)	9(17.6)	24(47.1)	13(25.5)	51	2.12	0.91
4	My level of innovation skills has improved through the availability of online databases	10(19.6)	22(43.1)	4(7.8)	15(29.4)	51	2.53	1.12
5	My level of technology skills has improved through information dissemination services	14(27.5)	14(27.5)	8(15.7)	15(29.4)	51	2.53	1.19
6	My level of acquiring knowledge has improved through information dissemination services	10(19.6)	18(35.3)	18(35.3)	5(9.8)	51	2.65	0.91
7	My driving towards enterprise has improved through CAS in the library	10(19.6)	5(9.8)	14(27.5)	22(43.1)	51	2.06	1.76
	Weighted mean						2.08	
	Decision							Low

Unilorin								
S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My level of entrepreneurial skills has improved through the provision of online databases	4(6.2)	20(30.8)	23(35.4)	18(27.7)	65	2.15	0.9
2	My level of curiosity skills has improved through the provision of library services.	10(15.4)	10(15.4)	39(60.0)	6(9.2)	65	2.37	0.86
3	My level of creativity skills has improved through the provision of CAS in the library	29(44.6)	14(21.5)	10(15.4)	12(18.5)	65	2.92	1.16
4	My level of innovation skills has improved through the availability of online databases	12(18.5)	22(33.8)	18(27.7)	13(20.0)	65	2.51	1.02
5	My level of technology skills has improved through information dissemination services	16(24.6)	30(46.2)	13(20.0)	6(9.2)	65	2.86	0.89
6	My level of acquiring knowledge has improved through information dissemination services	8(12.3)	14(21.5)	31(47.7)	12(18.5)	65	2.28	0.91
7	My driving towards enterprise has improved through CAS in the library	8(12.3)	6(9.2)	21(32.3)	30(46.2)	65	1.88	1.02
Weighted mean							2.42	
Decision							Low	
Uni Jos								
S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My level of entrepreneurial skills has improved through the provision of online databases	8(20.5)	7(17.9)	18(46.2)	6(15.4)	39	2.44	0.99
2	My level of curiosity skills has improved through the provision of library services.	4(10.3)	10(25.6)	17(43.6)	9(20.5)	39	2.37	2.26
3	My level of creativity skills has improved through the provision of CAS in the library	14(35.9)	10(25.6)	10(25.6)	5(12.8)	39	2.85	1.07
4	My level of innovation skills has improved through the availability of online databases	7(17.9)	15(38.5)	10(25.6)	7(17.9)	39	2.56	0.99
5	My level of technology skills has improved through information dissemination services	5(12.8)	12(30.8)	18(46.2)	4(10.3)	39	2.46	0.85

6	My level of acquiring knowledge has improved through dissemination services	4(10.3)	15(38.5)	16(41.0)	4(10.3)	39	2.49	0.82
7	My driving towards enterprise has improved through CAS in the library	5(12.8)	10(25.6)	6(15.4)	18(46.2)	39	2.05	1.12
	Weighted mean						2.46	
	Decision						Low	

Table 4.4 shows the level of skills acquisition of the undergraduate students of engineering students. Seven items were listed for the respondents to choose from. In Federal University Lokoja, a positive weighted mean of 2.82 was gotten and this shows that the level of skills acquisition of the studied students in this institution is high. In Federal University of Agriculture, Makurdi, a weighted mean of 2.70 was obtained, indicating that the students have a high level of skills acquisition. In Federal University of Technology, Minna, a weighted mean of 2.63 was obtained indicating that the students of Engineering have a high level of skills acquisition. University of Abuja is not left out of this high level of skills acquisition by the students as a weighted mean of 2.52 was obtained. . In University of Ilorin, a weighted mean of 2.81 was obtained, showing that their undergraduate students of Engineering equally have a high level of skills acquisition. In University of Jos, a weighted mean of 2.46 was obtained, showing a low level of skills acquisition of the engineering students.

Research question 3: What are the methods used for information dissemination, current awareness services and online databases in libraries for skills acquisition?

Table 4.5: Methods used for information dissemination, CAS and online databases

FUL								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition	15(47)	16(50)	1(3)	0	32	3.44	.56
2	The library provides self-service platform for management of information for my skills acquisition	4(13)	19(59)	6(19)	3(9)	32	2.75	.80
3	The library uses outreach programs to disseminate information tailored for my skills acquisition	3(9)	20(63)	7(22)	2(6)	32	2.75	.72
4	The library uses workshop and seminar to disseminate information to me	4(13)	19(59)	8(25)	1(3)	32	2.81	.69
5	The library uses Quick Response codes to disseminate information to me	5(16)	19(59)	7(22)	1(3)	32	2.88	.71
6	The library uses its website to disseminate information to me	4(13)	22(69)	5(16)	1(3)	32	2.91	.64
7	The library uses online reference services to disseminate information to me	4(13)	21(66)	6(19)	1(3)	32	2.88	.66
8	The library disseminates information to me through film/video	6(19)	18(56)	8(25)	0	32	2.94	.67
9	The library disseminates information to me through radio/television	5(16)	16(50)	11(34)	0	32	2.81	.69
Weighted mean							2.90	
Decision							High	

FUAM

S/No	Statement	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition	12(24.5)	31(63.3)	1(2.0)	5(10.2)	32	3.02	0.83
2	The library provides self-service platform for management of information for my skills acquisition	4(8.2)	36(73.5)	4(8.2)	5(10.2)	32	2.80	0.74
3.	The library uses outreach programs to disseminate information tailored for my skills acquisition	3(6.1)	33(67.3)	4(8.2)	9(18.4)	32	2.61	0.87
4	The library uses workshop and seminar to disseminate information to me	5(10.2)	29(59.2)	10(20.4)	5(10.2)	32	2.70	0.80
5	The library uses Quick Response codes to disseminate information to me	8(16.3)	30(61.2)	7(14.3)	4(8.2)	32	2.86	0.80
6	The library uses its website to disseminate information to me	9(18.4)	32(65.3)	6(12.2)	2(4.1)	32	3.0	0.70
7	The library uses online reference services to disseminate information to me	6(12.2)	32(65.3)	6(12.2)	5(10.2)	32	2.80	0.80
8	The library disseminates information to me through film/video	5(10.2)	27(55.1)	13(26.5)	4(8.2)	32	2.70	0.80
9	The library disseminates information to me through radio/television	25(51.0)	20(40.8)	4(8.2)	0	32	2.43	0.65
10	Others (please specify)							
	Weighted mean						2.49	
	Decision						Low	

FUT Minna

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition	42(58.3)	12(16.7)	8(11.1)	10(13.9)	72	3.19	0.11
2	The library provides self-service platform for management of information for my skills acquisition	16(22.2)	17(22.6)	17(23.6)	6(8.3)	72	2.60	0.93

3	The library uses outreach programs to disseminate information tailored for my skills acquisition	20(27.8)	17(23.6)	30(41.7)	5(6.9)	72	2.72	0.95
4	The library uses workshop and seminar to disseminate information to me	22(30.6)	8(11.1)	31(43.1)	11(15.3)	72	2.57	0.09
5	The library uses Quick Response codes to disseminate information to me	20(27.8)	21(29.2)	22(30.6)	9(12.5)	72	2.72	0.01
6	The library uses its website to disseminate information to me	9(12.5)	16(22.2)	30(41.7)	17(23.6)	72	2.24	0.96
7	The library uses online reference services to disseminate information to me	7(9.7)	13(18.1)	36(50.0)	16(22.2)	72	2.15	0.88
8	The library disseminates information to me through film/video	8(11.1)	25(34.7)	26(36.1)	13(18.1)	72	2.39	0.91
9	The library disseminates information to me through radio/television	6(8.3)	20(27.8)	32(44.4)	14(19.4)	72	2.25	0.87
10	Others (please specify)							
Weighted mean							2.28	
Decision							Low	

Uni Abuja

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition	23(45.1)	9(17.6)	5(9.8)	14(27.5)	51	2.80	1.28
2	The library provides self-service platform for management of information for my skills acquisition	19(37.3)	18(35.3)	4(7.8)	10(19.6)	51	2.90	1.11
3	The library uses outreach programs to disseminate information tailored for my skills acquisition	9(17.6)	14(27.5)	15(29.4)	13(25.5)	51	2.37	1.05
4	The library uses workshop and seminar to disseminate information to me	5(9.8)	18(35.3)	13(25.5)	15(29.4)	51	2.25	0.99
5	The library uses Quick Response codes to disseminate information to me	9(17.6)	14(27.5)	10(19.6)	18(35.3)	51	2.27	1.13

6	The library uses its website to disseminate information to me	10(9.6)	24(47.1)	5(9.8)	12(23.5)	51	2.63	1.06
7	The library uses online reference services to disseminate information to me	4(7.8)	28(54.9)	5(9.8)	14(27.5)	51	2.43	0.99
8	The library disseminates information to me through film/video	4(7.8)	22(43.1)	15(29.4)	10(9.6)	51	2.39	0.89
9	The library disseminates information to me through radio/television	9(17.6)	10(19.6)	10(19.6)	22(43.1)	51	2.12	1.16
11	Others (please specify)							
Weighted mean							2.46	
Decision							Low	

Uni Ilorin

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition	18(27.7)	16(24.6)	19(29.2)	12(18.5)	65	2.62	1.08
2	The library provides self-service platform for management of information for my skills acquisition	16(24.6)	29(44.6)	12(18.5)	8(12.3)	65	2.82	0.95
3	The library uses outreach programs to disseminate information tailored for my skills acquisition	10(15.4)	15(23.1)	22(33.8)	18(27.7)	65	2.26	1.03
4	The library uses workshop and seminar to disseminate information to me	4(6.2)	22(33.8)	22(33.8)	17(26.2)	65	2.20	0.90
5	The library uses Quick Response codes to disseminate information to me	12(18.5)	29(44.6)	12(18.5)	12(18.5)	65	2.63	0.99
6	The library uses its website to disseminate information to me	16(24.6)	21(32.3)	16(24.6)	12(18.5)	65	2.63	1.05
7	The library uses online reference services to disseminate information to me	21(32.3)	12(18.5)	22(33.8)	10(15.4)	65	2.68	1.15
9	The library disseminates information to me through film/video	18(27.7)	12(18.5)	19(29.2)	16(24.6)	65	2.49	1.15

8	The library disseminates information to me through radio/television	0	12(18.5)	29(44.6)	24(36.9)	65	1.82	0.73
9	Others (please specify)							
	Weighted mean						2.46	
	Decision						Low	

Uni Jos

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition	14(35.9)	8(20.5)	11(28.2)	6(15.4)	39	2.77	1.11
2	The library provides self-service platform for management of information for my skills acquisition	9(23.1)	6(15.4)	6(15.4)	18(46.2)	39	2.15	1.24
3	The library uses outreach programs to disseminate information tailored for my skills acquisition	6(15.4)	10(25.6)	13(33.3)	10(25.6)	39	2.31	1.03
4	The library uses workshop and seminar to disseminate information to me	5(12.8)	9(23.1)	17(43.6)	8(20.5)	39	2.28	0.94
5	The library uses Quick Response codes to disseminate information to me	2(5.1)	7(18.8)	11(28.2)	19(48.7)	39	1.79	0.92
6	The library uses its website to disseminate information to me	2(5.1)	10(25.5)	22(56.4)	5(12.8)	39	2.23	0.74
7	The library uses online reference services to disseminate information to me	5(12.8)	9(12.8)	14(35.9)	11(28.2)	39	2.21	1.00
8	The library disseminates information to me through film/video	2(5.1)	4(10.3)	14(35.9)	19(48.7)	39	1.72	0.86
9	The library disseminates information to me through radio/television	2(5.1)	2(5.1)	14(35.9)	21(53.8)	39	1.62	0.81
10	Others (please specify)						2.12	
	Weighted mean						low	
	Decision							

METHODS USED FOR CAS								
FUL								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library creates awareness through Selective Dissemination of Information	11(34)	15(47)	4(13)	2(6)	32	3.09	.86
2	The library creates awareness through google alert	7(22)	18(56)	7(22)	0	32	3.00	.67
3	The library creates awareness through library bulletins and newsletters	7(22)	20(63)	3(9)	2(6)	32	3.00	.76
4	The library creates awareness through notice boards	10(31)	18(56)	4(13)	0	32	3.19	.64
5	The library creates awareness through listing of new resources	9(28)	16(50)	7(22)	0	32	3.06	.72
6	The library creates awareness through subject Bibliography on demand	10(31)	18(56)	4(13)	0	32	3.19	.64
7	The library creates awareness through its website	7(23)	14(45)	10(32)	0	31	2.90	.75
8	The library creates awareness through E-mail and telephone services	7(22)	12(38)	12(38)	1(2)	32	2.78	.83
9	The library creates awareness through news clipping services	9(28)	12(38)	11(34)	0	32	2.94	.8
10	The library creates awareness through SMS	11(34)	14(44)	7(22)	0	32	3.13	.75
11	The library creates awareness through Poster and fliers	9(28)	18(56)	5(16)	0	32	3.13	.66
12	The library creates awareness through Bulletin boards	9(28)	15(47)	6(19)	2(6)	32	2.97	.86
13	The library creates awareness through Shelf display	6(19)	18(56)	7(22)	1(3)	32	2.91	.73
Weighted mean							3.50	
Decision							high	

FUAM

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library creates awareness through Selective Dissemination of Information	25(51.0)	17(34.7)	5(10.2)	2(4.1)	32	3.33	0.83
2	The library creates awareness through google alert	10(20.4)	31(63.3)	4(8.2)	4(8.2)	32	2.96	0.79
3	The library creates awareness through library bulletins and newsletters	10(20.4)	34(69.4)	1(2.0)	4(8.2)	32	3.02	0.75

4	The library creates awareness through notice boards	11(22.4)	28(57.1)	9(18.4)	1(2.0)	32	3.00	0.71
5	The library creates awareness through listing of new resources	9(18.4)	14(28.6)	22(44.9)	4(8.2)	32	2.57	0.89
6	The library creates awareness through subject Bibliography on demand	13(26.5)	28(57.1)	6(12.2)	2(4.1)	32	3.06	0.74
7	The library creates awareness through its website	6(12.2)	26(53.1)	12(24.5)	5(10.2)	32	2.67	0.82
8	The library creates awareness through E-mail and telephone services	5(10.2)	36(73.5)	7(14.3)	1(2.0)	32	2.92	0.57
9	The library creates awareness through news clipping services	6(12.2)	30(61.2)	11(22.4)	2(4.1)	32	2.82	0.69
10	The library creates awareness through SMS	5(10.2)	30(61.2)	11(22.4)	3(6.1)	32	2.76	0.72
11	The library creates awareness through Poster and fliers	6(12.2)	34(69.4)	5(10.2)	4(8.2)	32	2.86	0.73
12	The library creates awareness through Bulletin boards	6(12.2)	34(69.4)	0	9(18.4)	32	2.76	0.90
13	The library creates awareness through Shelf display	0	40(81.6)	0	9(18.4)	32	2.63	0.78
Weighted mean							2.87	
Decision							High	

FUT Minna

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library creates awareness through Selective Dissemination of Information	14(19.4)	39(54.2)	14(19.4)	5(6.9)	72	2.86	0.81
2	The library creates awareness through google alert	9(12.5)	28(38.9)	23(31.9)	12(16.7)	72	2.49	0.92
3	The library creates awareness through library bulletins and newsletters	7(9.7)	29(40.3)	17(23.6)	19(26.4)	72	2.33	0.98
4	The library creates awareness through notice boards	9(12.5)	24(33.3)	16(22.2)	23(31.9)	72	2.26	0.05
5	The library creates awareness through listing of new resources	10(13.9)	33(45.8)	23(31.9)	8(8.3)	72	2.65	0.83
6	The library creates awareness through subject Bibliography on demand	10(13.9)	39(54.2)	17(23.6)	6(8.3)	72	2.74	0.81
7	The library creates awareness through its website	13(18.1)	33(45.8)	21(29.2)	5(6.9)	72	2.75	0.84
8	The library creates awareness through E-mail and telephone services	13(18.1)	43(59.7) 0	16(22.2)	0	72	2.96	0.64

9	The library creates awareness through news clipping services	19(26.4)	34(47.2)	13(18.1)	6(8.3)	72	2.92	0.88
10	The library creates awareness through SMS	20(27.8)	29(40.3)	19(26.4)	4(5.6)	72	2.90	0.87
11	The library creates awareness through Poster and fliers	6(8.3)	51(70.8)	7(9.7)	8(11.1)	72	2.90	.87
12	The library creates awareness through Bulletin boards	17(23.6)	44(61.1)	6(8.3)	5(6.9)	72	2.76	0.76
13	The library creates awareness through Shelf display	8(11.1)	46(63.9)	12(16.7)	6(8.3)	72	3.01	0.78
Weighted mean							2.73	
Decision							High	

Uni Abuja

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library creates awareness through Selective Dissemination of Information	9(17.6)	10(19.6)	19(37.3)	13(25.5)	51	2.29	1.05
2	The library creates awareness through google alert	10(19.6)	8(15.7)	13(25.5)	20(39.2)	51	2.16	1.16
3	The library creates awareness through library bulletins and newsletters	8(15.7)	4(7.9)	29(56.9)	10(19.6)	51	2.20	0.94
4	The library creates awareness through notice boards	8(15.7)	19(37.3)	14(27.5)	10(19.6)	51	2.49	0.98
5	The library creates awareness through listing of new resources	8(15.7)	13(25.5)	15(29.4)	15(29.4)	51	2.27	1.06
6	The library creates awareness through subject Bibliography on demand	4(7.8)	14(27.5)	10(19.6)	23(45.1)	51	1.98	1.03
7	The library creates awareness through its website	13(25.5)	9(17.6)	10(19.6)	19(37.3)	51	2.31	1.23
8	The library creates awareness through E-mail and telephone services	4(7.8)	4(7.8)	20(39.2)	23(45.1)	51	1.78	0.90
9	The library creates awareness through news clipping services	4(7.8)	8(15.7)	15(29.4)	24(47.1)	51	1.84	0.97
10	The library creates awareness through SMS	4(7.8)	8(15.7)	24(47.1)	15(29.4)	51	2.02	0.88
11	The library creates awareness through Poster and fliers	5(9.8)	8(15.7)	18(35.3)	20(39.2)	51	1.96	0.98
12	The library creates awareness through Bulletin boards	9(17.6)	13(25.5)	20(39.2)	9(17.6)	51	2.43	0.98

13	The library creates awareness through Shelf display	14(27.5)	19(37.3)	14(27.5)	4(7.8)	51	2.84	0.93
	Weighted mean						2.19	
	Decision						Low	

UNI Ilorin

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library creates awareness through Selective Dissemination of Information	12(18.5)	22(33.8)	19(29.2)	12(18.5)	65	2.52	1.00
2	The library creates awareness through google alert	25(38.5)	0	32(49.2)	8(12.3)	65	2.65	1.12
3	The library creates awareness through library bulletins and newsletters	20(30.8)	20(30.8)	13(20.0)	12(18.5)	65	2.74	1.09
4	The library creates awareness through notice boards	15(23.1)	32(49.2)	12(18.5)	6(9.2)	65	2.86	0.88
5	The library creates awareness through listing of new resources	20(30.8)	23(35.4)	16(24.6)	6(9.2)	65	2.88	0.96
6	The library creates awareness through subject Bibliography on demand	10(15.4)	14(21.5)	17(26.2)	24(36.9)	65	2.15	1.09
7	The library creates awareness through its website	4(6.6)	17(27.9)	18(29.5)	22(36.1)	65	2.05	1.11
8	The library creates awareness through E-mail and telephone services	10(15.4)	11(16.9)	16(24.6)	28(43.1)	65	2.11	0.97
9	The library creates awareness through news clipping services	6(9.2)	16(24.6)	22(33.8)	21(32.3)	65	2.69	1.01
10	The library creates awareness through SMS	16(24.6)	23(35.4)	16(24.6)	10(15.4)	65	2.08	0.97
11	The library creates awareness through Poster and fliers	4(6.2)	21(32.3)	16(24.6)	24(36.9)	65	2.03	0.88
12	The library creates awareness through Bulletin boards	6(9.2)	8(12.3)	33(50.8)	18(27.7)	65	2.80	0.92
13	The library creates awareness through Shelf display	16(24.6)	26(40.0)	17(26.2)	6(9.2)	65	2.32	1.01
	Weighted mean						2.45	
	Decision						Low	

Uni Jos

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library creates awareness through Selective Dissemination of Information	18(46.2)	5(12.8)	8(20.5)	8(20.5)	39	2.85	1.23

2	The library creates awareness through google alert	6(5.4)	4(10.3)	7(17.9)	22(56.4)	39	1.85	1.34
3	The library creates awareness through library bulletins and newsletters	10(25.6)	18(46.2)	4(10.3)	7(17.9)	39	2.79	1.03
4	The library creates awareness through notice boards	9(23.1)	9(23.1)	9(23.1)	12(30.8)	39	2.38	1.16
5	The library creates awareness through listing of new resources	10(25.6)	5(12.8)	15(38.5)	9(23.1)	39	2.41	1.18
6	The library creates awareness through subject Bibliography on demand	3(7.7)	10(25.6)	13(33.3)	13(33.3)	39	2.08	0.96
7	The library creates awareness through its website	5(12.8)	13(33.3)	12(30.8)	9(23.1)	39	2.36	0.99
8	The library creates awareness through E-mail and telephone services	8(20.5)	20(51.3)	11(28.2)	0	39	2.92	0.70
9	The library creates awareness through news clipping services	11(28.2)	11(28.2)	6(15.4)	11(28.2)	39	2.56	2.19
10	The library creates awareness through SMS	8(20.5)	7(17.9)	11(28.2)	13(33.3)	39	2.26	1.14
11	The library creates awareness through Poster and fliers	13(13.3)	10(25.6)	7(17.9)	9(23.1)	39	2.69	1.17
12	The library creates awareness through Bulletin boards	3(7.7)	11(28.2)	16(41.0)	9(23.1)	39	2.21	0.89
13	The library creates awareness through Shelf display	14(35.9)	10(25.6)	11(28.2)	4(10.3)	39	2.87	1.03
	Weighted mean						2.26	
	Decision						low	

METHODS USED ONLINE DATABASE SERVICES

FUL	S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
	1	The library subscribes to ProQuest database	9(28)	20(63)	2(6)	1(3)	32	3.16	.68
	2	The library subscribes to JSTOR	6(19)	21(66)	5(16)	0	32	3.03	.59
	3	The library subscribes to Emerald	6(19)	18(56)	7(22)	0	32	3.91	.35
	4	The library subscribes to Science Direct	8(25)	10(31)	13(41)	1(3)	32	2.78	.87
	5	The library subscribes to Academic Videos Online	1(3)	11(34)	17(54)	3(9)	32	2.31	.69
	6	The library subscribes to Scopus	1(3)	6(19)	21(66)	4(12)	32	2.13	.66
	7	The library subscribes to <u>Educational Research Abstracts</u>	2(6)	5(16)	21(66)	4(12)	32	2.16	.72

Online (ERA)									
8	The library subscribes to EBSCO	2(6)	5(16)	22(69)	3(9)	32	2.19	.69	
9	The library subscribes to IEEE explore digital library	2(6)	7(22)	20(63)	3(9)	32	2.25	.72	
10	The library subscribes to project muse	2(6)	6(19)	20(63)	4(12)	32	2.19	.74	
Weighted mean								2.61	
Decision								low	

FUAM

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD	
1	The library subscribes to ProQuest database	8(16.3)	29(59.2)	4(8.2)	8(16.3)	32	2.76	0.92	
2	The library subscribes to JSTOR	0	39(79.6)	8(16.3)	2(4.1)	32	2.76	0.52	
3	The library subscribes to Emerald	0	18(36.7)	21(42.9)	10(20.4)	32	2.16	0.74	
4	The library subscribes to Science Direct	0	15(30.6)	34(69.4)	0	32	2.31	0.46	
5	The library subscribes to Academic Videos Online	0	20(40.8)	21(42.9)	8(16.3)	32	2.24	0.72	
6	The library subscribes to Scopus	0	6(12.2)	29(59.2)	14(28.6)	32	1.84	0.62	
7	The library subscribes to Educational Research Abstracts Online (ERA)	6(12.2)	0	38(77.6)	5(10.2)	32	2.14	0.76	
8	The library subscribes to EBSCO	5(10.2)	6(12.2)	34(69.4)	4(8.2)	32	2.24	0.75	
9	The library subscribes to IEEE explore digital library	6(12.2)	6(12.2)	27(55.1)	10(20.4)	32	2.16	0.89	
10	The library subscribes to project muse	6(12.2)	0	36(73.5)	7(14.3)	32	2.10	0.79	
Weighted mean								2.27	
Decision								low	

FUT Minna

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD	
1	The library subscribes to ProQuest database	7(9.7)	47(65.3)	12(16.7)	6(8.3)	72	2.78	0.76	
2	The library subscribes to JSTOR	6(8.3)	40(55.6)	17(23.6)	9(12.5)	72	2.76	74	

3	The library subscribes to Emerald	6(8.3)	41(56.9)	20(27.8)	5(6.9)	72	2.60	0.82
4	The library subscribes to Science Direct	22(30.6)	28(38.9)	16(22.2)	6(8.3)	72	2.67	0.73
5	The library subscribes to Academic Videos Online	12(16.7)	29(40.3)	18(25.0)	13(18.1)	72	2.92	0.93
6	The library subscribes to Scopus	8(11.1)	34(47.2)	16(22.2)	14(19.4)	72	2.56	0.97
7	The library subscribes to Educational Research Abstracts Online (ERA)	14(19.4)	26(36.1)	19(26.4)	13(18.1)	72	2.50	0.93
8	The library subscribes to EBSCO	5(6.9)	40(55.6)	16(22.2)	11(15.3)	72	2.57	0.05
9	The library subscribes to IEEE explore digital library	6(8.3)	36(50)	13(18.1)	17(23.6)	72	2.54	0.84
10	The library subscribes to project muse	8(11.1)	37(51.4)	16(22.2)	11(15.3)	72	2.43	0.95
	Weighted mean						2.63	
	Decision						low	

Uni Abuja

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library subscribes to ProQuest database	5(9.8)	27(52.9)	10(19.6)	9(17.6)	51	2.55	0.90
2	The library subscribes to JSTOR	9(17.6)	27(52.9)	15(29.4)	0	51	2.88	0.68
3	The library subscribes to Emerald	14(27.5)	13(25.5)	14(27.5)	10(19.6)	51	2.61	1.09
4	The library subscribes to Science Direct	5(9.8)	21(41.2)	10(19.6)	15(29.4)	51	2.31	1.01
5	The library subscribes to Academic Videos Online	9(17.7)	18(35.3)	24(47.1)	0	51	2.71	0.85
6	The library subscribes to Scopus	13(25.5)	15(29.4)	13(25.5)	10(19.6)	51	2.61	1.08
7	The library subscribes to Educational Research Abstracts Online (ERA)	4(7.8)	14(27.5)	23(45.1)	10(19.6)	51	2.24	0.86
8	The library subscribes to EBSCO	4(7.8)	9(17.6)	23(45.1)	15(29.4)	51	2.04	0.89
9	The library subscribes to IEEE explore digital library	4(7.8)	4(7.8)	24(47.1)	19(37.3)	51	1.86	0.87
10	The library subscribes to project muse	4(7.8)	5(9.8)	13(25.5)	29(56.9)	51	1.69	0.95
	Weighted mean						2.35	
	Decision						low	

Uni Ilorin

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library subscribes to ProQuest database	10(15.4)	17(26.2)	22(33.8)	16(24.6)	65	2.51	0.94
2	The library subscribes to JSTOR	12(18.5)	17(26.2)	28(43.2)	8(12.3)	65	2.48	1.05
3	The library subscribes to Emerald	16(24.6)	10(15.4)	28(43.1)	11(16.9)	65	2.69	1.18
4	The library subscribes to Science Direct	22(33.8)	17(26.2)	10(15.4)	16(24.6)	65	2.11	1.06
5	The library subscribes to Academic Videos Online	16(24.6)	4(6.2)	16(24.6)	29(44.6)	65	2.60	1.12
6	The library subscribes to Scopus	16(24.6)	23(35.4)	10(15.4)	16(24.6)	65	2.20	1.09
7	The library subscribes to Educational Research Abstracts Online (ERA)	10(15.4)	16(24.6)	16(24.6)	23(35.4)	65	2.51	1.03
8	The library subscribes to EBSCO	14(21.5)	17(26.2)	22(33.8)	12(18.5)	65	2.42	0.83
9	The library subscribes to IEEE explore digital library	6(9.2)	23(35.4)	28(43.1)	8(12.3)	65	2.38	0.60
10	The library subscribes to project muse	4(6.2)	17(26.2)	44(67.7)	0	65	3.02	0.80
Weighted mean							2.50	
Decision							high	

UNIVERSITY OF JOS PLATEAU STATE

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	The library subscribes to ProQuest database	13(33.3)	12(30.8)	8(20.5)	6(15.4)	39	2.82	1.07
2	The library subscribes to JSTOR	9(23.1)	12(30.8)	11(28.2)	7(17.9)	39	2.59	1.04
3	The library subscribes to Emerald	11(28.2)	8(20.5)	11(28.2)	9(23.1)	39	2.54	1.14
4	The library subscribes to Science Direct	11(28.2)	9(23.1)	13(33.3)	6(15.4)	39	2.64	1.06
5	The library subscribes to Academic Videos Online	2(5.1)	7(17.9)	19(48.7)	11(28.2)	39	2.00	0.83
6	The library subscribes to Scopus	3(7.7)	11(28.2)	17(43.6)	8(20.5)	39	2.23	0.87
7	The library subscribes to Educational Research Abstracts Online (ERA)	6(15.4)	4(10.3)	17(43.6)	12(30.8)	39	2.10	1.02
8	The library subscribes to EBSCO	6(15.4)	19(48.7)	9(23.1)	5(12.8)	39	2.67	0.89

9	The library subscribes to IEEE explore digital library	10(25.6)	11(28.2)	16(41.0)	2(5.1)	39	2.74	0.91
10	The library subscribes to project muse	2(5.1)	5(12.8)	16(41.0)	16(41.0)	39	1.82	0.85
	Weighted mean						2.41	
	Decision						low	

Table 4.5 reveals respondents' feedback on the methods used for information dissemination, CAS and online databases. In Federal University, Lokoja, a weighted mean of 2.90 was obtained, indicating that information dissemination has a high impact on skills acquisition of undergraduate Engineering students. In Federal University of Agriculture, Makurdi, a weighted mean of 2.49 was obtained, indicating that the impact of information dissemination on skills acquisition is low. Similarly, in FUT Minna, a weighted mean of 2.28 was obtained, showing that information dissemination has a low impact on skills acquisition. In University of Abuja, a weighted mean of 2.46 was derived, showing that information dissemination has a low impact on skills acquisition. In uni6 of Ilorin, a weighted mean of 2.46 was obtained, indicating that information dissemination has a low impact on skills acquisition. In the United of Jos, a weighted mean of 2.12 was obtained. This shows that information dissemination has a low impact on skills acquisition.

The respondents' feedback was also measured on the methods used in carrying out CAS. In Federal University, Lafia, a weighted mean of 3.50 was obtained, indicating a high level of impact of CAS on skills acquisition of undergraduate Engineering students. In Federal University of Agriculture, Makurdi, a weighted mean of 2.87 was obtained, indicating that CAS has a high impact on skills acquisition. In FUT Minna, a weighted mean of 2.73 was obtained, indicating that CAS has a high impact on skills acquisition of undergraduate Engineering students. In University of Abuja, a

weighted mean of 2.19 was obtained, indicating that CAS has a low impact on skills acquisition of undergraduate Engineering students. In University of Ilorin. A weighted mean of 2.45 was obtained, showing that CAS has a low impact on skills acquisition of undergraduate Engineering students. In University of Jos, a weighted mean of 2.26 was obtained. Indicating that CAS has a low impact on skills acquisition of undergraduate engineering students.

The respondent feedback was also measured on the methods used for online database services. In Federal University Lafia, a weighted mean of 2.61 was obtained, indicating that online databases have a high impact on skills acquisition. In Federal University of Agriculture, Makurdi, a weighted mean of 2.27 was obtained. This shows that online databases have low impact on skills acquisition. In FUT Minna, a weighted mean of 2.63 was obtained, which shows that online databases have a high impact on skills acquisition of undergraduate Engineering students. In university of Abuja, a weighted mean of 2.35 was obtained. This indicates that online databases have a low impact on skills acquisition of undergraduate Engineering students. In University of Ilorin, however, a weighted mean of 2.50 was obtained, indicating that online databases have a high impact on skills acquisition of undergraduate Engineering students. University of Jos on the other hand, recorded a weighted mean of 2.41, indicating that online database has a low impact on skills acquisition of undergraduate Engineering students.

Research question 4.: What is the relationship between information dissemination and skills acquisition in libraries of federal universities in North Central, Nigeria?

Table 4.6: Relationship between Information Dissemination and Skills Acquisition

FUL								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	N	\bar{x}	StD
1	Through information dissemination, I have acquired technical skills	1(3)	27(85)	4(12)	0	32	2.91	.39
2	Through information dissemination, I have acquired entrepreneurial skills	1(3)	25(78)	6(19)	0	32	2.84	.45
3	Through information dissemination, I have acquired leadership skills	1(3)	25(78)	6(19)	0	32	2.84	.45
4	Through information dissemination, I have acquired Problem-solving skills	1(3)	21(66)	10(31)	0	32	2.72	.52
5	Through information dissemination, I have acquired innovative skills	2(6)	21(66)	8(25)	1(3)	32	2.75	.62
6	Through information dissemination, I have acquired ICT skills	4(12)	21(66)	6(19)	1(3)	32	2.88	.66
7	Through information dissemination, I have acquired coding skills	4(12)	22(69)	6(19)	0	32	2.94	.56
8	Through information dissemination, I have acquired project management skills	4(12)	24(76)	4(12)	0	32	3.0	.51
9	Through information dissemination, I have acquired modelling skills	5(16)	21(66)	5(16)	1(3)	32	2.94	.66
Weighted mean							2.87	
Decision							high	
FUAM								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Through information dissemination, I have acquired technical skills	3(6.1)	31(63.3)	6(12.2)	9(18.4)	32	2.87	0.87
2	Through information dissemination, I have acquired entrepreneurial skills	5(10.2)	35(71.4)	3(6.1)	6(12.2)	32	2.15	0.75
3	Through information dissemination, I have acquired	5(10.2)	31(63.3)	8(16.3)	5(10.2)	32	2.73	0.78

	leadership skills							
4	Through information dissemination, I have acquired Problem-solving skills	2(4.1)	34(69.4)	10(20.4)	3(6.1)	32	2.71	0.64
5	Through information dissemination, I have acquired innovative skills	8(16.3)	27(55.1)	13(26.5)	1(2.0)	32	2.86	0.70
6	Through information dissemination, I have acquired ICT skills	14(28.6)	35(71.4)	0	0	32	3.29	0.45
7	Through information dissemination, I have acquired coding skills	9(18.4)	38(77.6)	0	2(4.1)	32	3.10	0.58
8	Through information dissemination, I have acquired project management skills	6(12.2)	39(79.6)	0	4(8.2)	32	2.96	0.67
9	Through information dissemination, I have acquired modelling skills	5(10.2)	40(81.4)	1(2.0)	3(6.1)	32	2.96	0.61
	Weighted mean						2.84	
	Decision						high	
FUT Minna								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Through information dissemination, I have acquired technical skills	9(12.5)	41(56.9)	14(19.4)	8(11.1)	72	2.71	0.83
2	Through information dissemination, I have acquired entrepreneurial skills	10(13.9)	43(59.7)	16(22.2)	3(4.2)	72	2.83	0.71
3	Through information dissemination, I have acquired leadership skills	6(8.3)	37(51.4)	22(30.6)	7(9.7)	72	2.58	0.78
4	Through information dissemination, I have acquired Problem-solving skills	10(13.9)	47(65.3)	15(20.8)	0	72	2.93	0.59
5	Through information dissemination, I have acquired innovative skills	0	50(69.4)	14(19.4)	8(11.1)	72	2.58	0.69
6	Through information dissemination, I have acquired ICT skills	0	51(70.8)	11(15.3)	10(13.9)	72	2.57	0.73
7	Through information dissemination, I have acquired coding skills	7(9.7)	36(50.0)	20(27.8)	9(12.5)	72	2.57	0.84
8	Through information dissemination, I have acquired project management skills	8(11.1)	41(56.9)	18(25.0)	5(6.9)	72	2.72	0.76

9	Through information dissemination, I have acquired modelling skills	6(8.3)	33(45.8)	11(15.3)	22(30.6)	72	2.30	1.0
10	Through information dissemination, I have acquired curiosity skills	9(12.5)	40(55.6)	15(20.8)	8(11.1)	72	2.69	0.83
	Weighted mean						2.64	
	Decision							high

Uni Abuja

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Through information dissemination, I have acquired technical skills	18(35.3)	18(35.3)	15(29.4)	0	51	3.06	0.81
2	Through information dissemination, I have acquired entrepreneurial skills	14(27.5)	12(23.5)	15(29.4)	10(19.6)	51	2.59	1.09
3	Through information dissemination, I have acquired leadership skills	8(15.7)	18(35.3)	10(19.6)	15(29.4)	51	2.37	1.08
4	Through information dissemination, I have acquired Problem-solving skills	9(17.6)	13(25.5)	14(27.5)	15(29.4)	51	2.31	1.09
5	Through information dissemination, I have acquired innovative skills	9(17.6)	27(52.9)	10(19.6)	5(9.8)	51	2.78	0.86
6	Through information dissemination, I have acquired ICT skills	5(9.8)	27(52.9)	9(17.6)	10(19.6)	51	2.53	0.92
7	Through information dissemination, I have acquired coding skills	10(19.6)	27(52.9)	10(19.6)	4(7.8)	51	2.84	0.83
8	Through information dissemination, I have acquired project management skills	10(19.6)	19(37.3)	8(15.7)	14(27.5)	51	2.49	1.10
9	Through information dissemination, I have acquired modelling skills	5(9.8)	10(19.6)	17(33.3)	19(37.3)	51	2.02	0.99
10	Through information dissemination, I have acquired curiosity skills	5(9.8)	5(9.8)	15(29.4)	26(51.0)	51	1.78	0.99
	Weighted mean						2.47	
	Decision							low

UNIJJOS

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	- □	StD
1	Through information dissemination, I have acquired technical skills	21(32.3)	24(36.9)	20(30.8)	0	65	2.62	1.10
2	Through information dissemination, I have acquired entrepreneurial skills	19(29.2)	14(21.5)	20(30.8)	12(18.5)	65	2.08	1.00
3	Through information dissemination, I have acquired leadership skills	8(12.3)	11(16.9)	24(36.9)	22(33.8)	65	2.63	0.99
4	Through information dissemination, I have acquired Problem-solving skills	12(18.5)	29(44.6)	12(18.5)	12(18.5)	65	2.62	1.06
5	Through information dissemination, I have acquired innovative skills	16(24.6)	20(30.8)	17(26.2)	12(18.5)	65	2.78	1.08
6	Through information dissemination, I have acquired ICT skills	20(30.8)	23(35.4)	10(15.4)	12(18.5)	65	2.74	1.05
7	Through information dissemination, I have acquired coding skills	17(26.2)	26(40.0)	10(15.4)	12(18.5)	65	2.28	1.14
8	Through information dissemination, I have acquired project management skills	13(20.0)	14(21.5)	16(24.6)	22(33.8)	65	2.11	1.06
9	Through information dissemination, I have acquired modelling skills	10(15.4)	10(15.4)	22(33.8)	23(35.4)	65	2.65	1.07
10	Through information dissemination, I have acquired curiosity skills	17(26.2)	20(30.8)	16(24.6)	12(18.5)	65	2.32	1.06
	Weighted mean						2.48	
	Decision						low	

UNILLORIN

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	- □	StD
1	Through information dissemination, I have acquired technical skills	6(15.4)	19(48.7)	9(23.1)	5(12.8)	39	2.67	0.89
2	Through information dissemination, I have acquired entrepreneurial skills	12(30.8)	12(30.8)	12(30.8)	3(7.7)	39	2.85	0.96
3	Through information dissemination, I have acquired leadership skills	8(20.5)	17(43.6)	10(25.6)	4(10.3)	39	2.74	0.91
4	Through information dissemination, I have acquired curiosity skills	6(15.4)	14(35.9)	17(43.6)	2(5.1)	39	2.62	0.81

	dissemination, I have acquired							
	Problem-solving skills							
5	Through information dissemination, I have acquired innovative skills	17(43.6)	13(33.3)	7(17.9)	2(5.1)	39	3.15	0.90
6	Through information dissemination, I have acquired ICT skills	13(33.3)	7(17.9)	16(41.0)	3(7.7)	39	2.77	1.01
7	Through information dissemination, I have acquired coding skills	14(35.9)	9(23.1)	10(25.6)	6(15.4)	39	2.79	1.10
8	Through information dissemination, I have acquired project management skills	3(7.7)	6(15.4)	18(46.2)	12(30.8)	39	2.00	0.89
9	Through information dissemination, I have acquired modelling skills	3(7.7)	8(20.5)	15(38.5)	13(33.3)	39	2.03	0.93
10	Through information dissemination, I have acquired curiosity skills					39		
	Weighted mean						2.3	
							5	
	Decision							low

Table 4.6 reveals the respondents' feedback on the relationship between information dissemination and undergraduate students of engineering skills acquisition in the libraries studied. Nine items were listed for respondents to show the relationship between information dissemination and skills acquisition.

In Federal University, Lokoja and Federal University of Agriculture, Makurdi, all the 9 listed items had a positive mean values of 2.5 and above. A weighted mean value of 2.86 and 3.1 respectively were obtained, showing that there is high relationship between information dissemination and skills acquisition of the studied students.

In Federal University of Technology, Minna, on the other hand, a weighted mean of 2.64 was obtained, which shows a high relationship between information dissemination and skills acquisition. In university of Abuja, weighted mean of 2.74 was obtained which shows a high relationship between information dissemination and skills

acquisition. University of Ilorin, a weighted mean of 2.76 was obtained, showing a good relationship between Information dissemination and skills acquisition. In university of Jos, a weighted mean of 2.98 was obtained, showing a high relationship between information dissemination and skills acquisition.

Research question 5: What is the relationship between Current Awareness Services (CAS) and undergraduate students of engineering skills acquisition in libraries of federal universities in North Central, Nigeria?

Table 4.7: Relationship between CAS and Skills Acquisition

FUL									
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	N	\bar{x}	StD	
1	Through CAS such as google alert, the library improves my skills acquisition.	6(19)	18(56)	6(19)	2(6)	32	2.88	.79	
2	Through CAS such as new arrivals, the library improves my skills acquisition,	1(3)	26(82)	4(12)	1(3)	32	2.84	.52	
3	Through CAS such as shelve display, the library improves my skills acquisition.	2(6.3)	19(59.4)	10(31.3)	1(3.1)	32	2.69	.64	
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.	5(16)	23(72)	4(12)	0	32	3.03	.53	
5	Through CAS such as posters and fliers, the library improves my skills acquisition.	4(12)	22(69)	4(12)	2(6)	32	2.8	.71	
6	Through CAS such as email, the library improves my skills acquisition.	4(12)	18(56)	8(25)	2(6)	32	2.75	.76	
7	Through CAS such as SMS, the library improves my skills acquisition.	5(15.6)	18(56.3)	7(21.9)	2(6.2)	32	3.50	.62	
8	Through CAS such as library websites, the library improves my skills acquisition.	7(21.9)	16(50.0)	6(18.8)	3(9.4)	32	2.84	.88	
9	Through CAS such as social media like Facebook, Instagram and twitter, the library improves my skills acquisition.	7(21.9)	21(65.6)	3(9.4)	1(3.1)	32	3.06	.56	
	Weighted mean						2.93		
	Decision						high		
FUAM									
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD	
1	Through CAS such as google alert, the library improves my skills acquisition.	0	41(83.7)	6(12.2)	2(4.1)	32	2.80	0.49	
2	Through CAS such as new	0	35(71.4)	6(12.2)	8(16.3)	32	2.55	0.76	

3	arrivals, the library improves my skills acquisition, Through CAS such as shelf display, the library improves my skills acquisition.	0	31(63.3)	12(24.5)	6(12.2)	32	2.51	7.11
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.	4(8.2)	36(73.5)	6(12.2)	3(6.1)	32	2.84	0.65
5	Through CAS such as posters and fliers, the library improves my skills acquisition.	5(10.2)	35(71.4)	5(10.2)	4(8.2)	32	2.84	0.71
6	Through CAS such as email, the library improves my skills acquisition.	0	29(59.2)	16(32.7)	4(8.2)	32	2.51	0.64
7	Through CAS such as SMS, the library improves my skills acquisition.	0	31(63.3)	6(12.2)	9(18.4)	32	3.73	5.03
8	Through CAS such as library websites, the library improves my skills acquisition.	6(12.2)	31(63.3)	6(12.2)	6(12.2)	32	2.76	0.83
9	Through CAS such as social media like Facebook, Instagram and twitter, the library improves my skills acquisition.	0	40(81.6)	5(10.2)	4(8.2)	32	2.73	0.60
10	Through CAS such as library website, the library improves my skills acquisition.	0	45(91.2)	0	4(8.2)	32	2.84	0.55

Weighted mean

Decision

2.8
1
high

FUTMINNA

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	N	\bar{x}	StD
1	Through CAS such as google alert, the library improves my skills acquisition.	11(15.3)	37(51.4)	18(25.0)	6(8.3)	72	2.74	0.82
2	Through CAS such as new arrivals, the library improves my skills acquisition,	16(22.2)	39(54.2)	11(15.3)	6(8.3)	72	2.90	0.84
3	Through CAS such as shelf display, the library improves my skills acquisition.	15(20.8)	41(56.9)	8(11.1)	8(11.1)	72	2.88	0.87
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.	10(13.9)	44(61.1)	11(15.3)	7(9.7)	72	2.79	0.80
5	Through CAS such as posters and fliers, the library improves my skills acquisition.	10(13.9)	44(61.1)	10(13.9)	8(11.1)	72	2.78	0.83

6	Through CAS such as email, the library improves my skills acquisition.	21(29.2)	31(43.1)	13(18.1)	7(9.7)	72	2.92	0.93
7	Through CAS such as SMS, the library improves my skills acquisition.	23(31.9)	29(40.3)	14(19.4)	6(8.3)	72	2.96	0.93
8	Through CAS such as library websites, the library improves my skills acquisition.	27(37.5)	25(34.7)	13(18.1)	7(9.7)	72	3.00	0.98
9	Through CAS such as social media like Facebook, Instagram and twitter, the library improves my skills acquisition.	28(38.9)	24(33.3)	14(19.4)	6(8.3)	72	3.03	0.96
10	Through CAS such as library website, the library improves my skills acquisition.	23(31.9)	29(40.3)	13(18.1)	7(9.7)	72	2.94	0.95

Weighted mean

2.89

Decision

high

Uni Abuja

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	N	- □	Std
1	Through CAS such as google alert, the library improves my skills acquisition.	5(9.8)	5(9.8)	23(45.1)	18(35.3)	51	1.94	0.92
2	Through CAS such as new arrivals, the library improves my skills acquisition,	9(17.6)	15(29.4)	18(35.3)	9(17.6)	51	2.47	0.98
3	Through CAS such as shelve display, the library improves my skills acquisition.	18(35.3)	9(17.6)	14(27.5)	10(19.6)	51	2.69	1.16
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.	19(37.3)	17(33.3)	10(19.6)	5(9.8)	51	2.98	0.99
5	Through CAS such as posters and fliers, the library improves my skills acquisition.	5(9.8)	19(37.3)	22(43.1)	5(9.8)	51	2.47	0.91
6	Through CAS such as email, the library improves my skills acquisition.	5(9.8)	9(17.6)	23(45.1)	14(27.5)	51	2.10	0.92
7	Through CAS such as SMS, the library improves my skills acquisition.	9(17.6)	14(27.5)	19(37.3)	9(17.6)	51	2.45	0.99
8	Through CAS such as library websites, the library improves my skills acquisition.	0	5(9.8)	14(27.5)	32(62.7)	51	1.47	0.67
9	Through CAS such as social media like Facebook,	9(17.6)	14(27.5)	18(35.3)	10(19.6)	51	2.43	1.00

	Instagram and twitter, the library improves my skills acquisition.							
10	Through CAS such as library website, the library improves my skills acquisition.	5(9.8)	9(17.6)	13(25.5)	24(47.1)	51	1.90	1.02
	Weighted mean						2.29	
	Decision					51	low	

Uni Ilorin

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	N	- □	Std
1	Through CAS such as google alert, the library improves my skills acquisition.	10(15.4)	20(30.8)	16(24.6)	19(29.2)	65	2.95	1.04
2	Through CAS such as new arrivals, the library improves my skills acquisition,	23(35.4)	26(40.0)	6(9.2)	10(15.4)	65	2.95	1.04
3	Through CAS such as shelve display, the library improves my skills acquisition.	23(35.4)	26(40.0)	6(9.2)	10(15.2)	65	2.20	0.96
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.	6(9.2)	19(29.2)	22(33.8)	18(27.7)	65	2.63	1.05
5	Through CAS such as posters and fliers, the library improves my skills acquisition.	16(24.6)	21(32.3)	16(24.6)	12(18.5)	65	1.74	0.57
6	Through CAS such as email, the library improves my skills acquisition.	0	4(6.2)	40(61.5)	21(32.3)	65	2.82	0.95
7	Through CAS such as SMS, the library improves my skills acquisition.	16(24.6)	29(44.6)	12(18.5)	8(12.3)	65	2.26	0.87
8	Through CAS such as library websites, the library improves my skills acquisition.	6(9.2)	17(26.2)	30(46.2)	12(8.5)	65	2.85	1.06
9	Through CAS such as social media like Facebook, Instagram and twitter, the library improves my skills acquisition.	22(33.8)	21(32.3)	12(18.5)	10(15.4)	65	2.58	1.06
10	Through CAS such as library website, the library improves my skills acquisition.	14(21.5)	24(36.9)	13(20.0)	14(21.5)	65	2.89	1.05
	Weighted mean						2.58	
	Decision						high	

Uni Jos								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Through CAS such as google alert, the library improves my skills acquisition.	5(12.8)	12(30.8)	9(33.1)	13(33.3)	39	2.23	1.06
2	Through CAS such as new arrivals, the library improves my skills acquisition,	13(33.3)	12(30.8)	11(28.2)	3(7.7)	39	2.90	0.97
3	Through CAS such as shelve display, the library improves my skills acquisition.	14(35.9)	14(35.9)	11(28.2)	0	39	3.08	0.81
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.	5(12.8)	6(15.4)	10(25.6)	18(46.2)	39	1.95	1.07
5	Through CAS such as posters and fliers, the library improves my skills acquisition.	5(12.8)	19(48.7)	7(17.9)	8(20.5)	39	2.54	0.97
6	Through CAS such as email, the library improves my skills acquisition.	2(5.1)	10(25.6)	13(33.3)	14(35.9)	39	2.00	0.92
7	Through CAS such as SMS, the library improves my skills acquisition.	14(35.9)	11(28.2)	6(15.4)	8(20.5)	39	2.79	1.15
8	Through CAS such as library websites, the library improves my skills acquisition.	6(15.4)	10(25.6)	17(43.6)	6(15.4)	39	2.41	0.94
9	Through CAS such as social media like Facebook, Instagram and twitter, the library improves my skills acquisition.	5(12.8)	10(25.6)	17(43.6)	7(17.9)	39	2.33	0.93
10	Through CAS such as library website, the library improves my skills acquisition.	15(38.5)	12(30.8)	10(25.6)	2(3.03)	39	3.03	0.93
Weighted mean							2.52	
Decision							high	

Table 4.7 shows the relationship between Current Awareness Services (CAS) and undergraduate students of Engineering skills acquisition in the libraries studied. Ten items were listed for the respondents to choose from.

In Federal University, Lokoja a weighted mean of 2.90 was derived indicating a high relationship between CAS and skills acquisition. In Federal University of Agriculture, Makurdi a weighted mean of 2.81 was derived, indicating a high relationship between CAS and skills acquisition. In the Federal University of Technology Minna, a weighted mean of 2.89 was obtained, indicating a high relationship between CAS and skills acquisition. In University of Abuja, a weighted mean of 2.29 was obtained, which indicates low relationship between CAS and skills acquisition. In University of Ilorin, there exists a high relationship between CAS and skills acquisition because a weighted mean of 2.59 was obtained. In University of Jos, a weighted mean of 2.53 was obtained indicating a positive relationship between CAS and skills acquisition.

Research question 6: What is the relationship between online databases and undergraduate students of engineering skills acquisition in libraries of federal universities in North Central, Nigeria?

Table 4.8 Relationship Between online databases and skills acquisition

FUL									
S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	N	\bar{x}	StD	
1	My modelling skills has improved through the provision of online databases	6(18.8)	22(68.8)	4(12.5)	0	32	2.88	61	
2	My ICT skills has improved through the provision of online databases	2(6.3)	26(81.3)	2(6.3)	2(6.3)	32	2.88	61	
3	I have acquired communication skills through the provision of online databases	1(3.1)	26(81.3)	3(9.4)	2(6.3)	32	2.81	59	
4	The online databases services provided by my library facilitates my technological skills	3(9.4)	25(78.1)	4(12.5)	0	32	2.97	47	
5	My technical skills has improved through the provision of online databases	3(9.4)	21(56.6)	8(25)	0	32	28.4	57	

6	My level of driving towards enterprise has improved through the provision of online databases	3(9.4)	23(71.9)	6(18.8)	0	32	2.9	53
	Weighted mean						2.88	
	Decision						low	
FUAM								
S/No	Statements	SA 4	A 3	D 2	SD 1	n	\bar{x}	StD
1	My modelling skills has improved through the provision of online databases	3(6.1)	35(71.4)	3(6.1)	8(16.3)	49	2.67	.82
2	My ICT skills has improved through the provision of online databases	2(4.1)	36(73.5)	2(4.1)	9(18.4)	49	2.63	.83
3	I have acquired communication skills through the provision of online databases	2(4.1)	35(71.4)	5(10.2)	7(14.3)	49	2.65	0.77
4	The online databases services provided by my library facilitates my technological skills	0	34(69.4)	3(6.10)	12(24.5)	49	2.45	0.86
5	My technical skills has improved through the provision of online databases	5(10.2)	17(34.7)	23(46.9)	4(8.2)	49	2.47	0.79
6	My level of driving towards enterprise has improved through the provision of online databases	0	25(51.0)	21(42.9)	3(6.1)	49	2.45	0.61
	Weighted mean						2.55	
	Decision						high	
FUT Minna								
S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My modelling skills has improved through the provision of online databases	20(27.8)	34(47.2)	10(13.9)	8(11.1)	72	2.92	0.93
2	My ICT skills has improved through the provision of online databases	12(16.7)	46(63.9)	7(9.7)	7(9.7)	72	2.88	0.80
3	I have acquired communication skills through the provision of online databases	17(23.6)	49(68.1)	6(8.3)	0	72	3.15	0.55
4	The online databases services provided by my library facilitates my technological skills	10(13.9)	38(52.8)	7(9.7)	17(23.6)	72	2.57	1.0

5	My technical skills has improved through the provision of online databases	11(15.3)	40(55.6)	10(13.9)	11(15.3)	72	2.71	0.91
6	My level of driving towards enterprise has improved through the provision of online databases	12(16.7)	40(55.6)	12(16.7)	8(11.1)	72	2.78	0.86
Weighted mean							2.83	
Decision							high	

Uni Abuja

S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My modelling skills has improved through the provision of online databases	9(17.6)	24(47.1)	5(9.8)	14(26.5)	51	2.57	1.06
2	My ICT skills has improved through the provision of online databases	5(9.8)	10(19.6)	19(37.3)	17(33.3)	51	2.06	0.96
3	I have acquired communication skills through the provision of online databases	14(27.5)	9(17.6)	18(35.3)	10(19.6)	51	2.53	1.10
4	The online databases services provided by my library facilitates my technological skills	4(7.8)	23(45.1)	5(9.8)	19(37.3)	51	2.24	1.05
5	My technical skills has improved through the provision of online databases	5(9.8)	13(25.5)	18(35.3)	15(29.4)	51	2.16	0.97
6	My level of driving towards enterprise has improved through the provision of online databases	4(7.8)	9(17.6)	20(39.2)	18(35.3)	51	1.98	0.93
Weighted mean							2.25	
Decision							low	

Uni Ilorin

S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My modelling skills has improved through the provision of online databases	24(36.9)	18(27.7)	15(23.1)	8(12.3)	65	2.92	1.00
2	My ICT skills has improved through the provision of online databases	22(33.8)	24(36.9)	11(16.9)	8(12.3)	65	2.74	0.99
3	I have acquired communication skills through the provision of online databases	17(26.2)	22(33.8)	18(27.7)	8(12.3)	65	2.45	1.00
4	The online databases services	12(18.5)	17(26.2)	24(36.9)	12(18.5)	65	2.17	0.91

	provided by my library facilitates my technological skills							
5	My technical skills has improved through the provision of online databases	4(6.2)	21(32.3)	22(33.8)	18(27.7)	65	2.31	1.01
6	My level of driving towards enterprise has improved through the provision of online databases	8(12.3)	22(33.8)	17(26.2)	18(27.7)	65	2.95	0.98
	Weighted mean						2.59	
	Decision							high
Uni Jos								
S/No	Statements	VH (4)	H (3)	L (2)	VL (1)	n	\bar{x}	StD
1	My modelling skills has improved through the provision of online databases	6(15.4)	12(30.8)	12(30.8)	9(23.1)	39	2.38	1.00
2	My ICT skills has improved through the provision of online databases	14(35.9)	10(25.6)	8(20.5)	7(17.9)	39	2.79	1.13
3	I have acquired communication skills through the provision of online databases	2(5.1)	6(15.4)	15(38.5)	16(41.0)	39	1.45	0.86
4	The online databases services provided by my library facilitates my technological skills	14(35.9)	12(30.8)	8(20.5)	5(12.8)	39	2.90	1.05
5	My technical skills has improved through the provision of online databases	9(23.1)	15(38.5)	8(20.5)	7(17.9)	39	2.67	1.03
6	My level of driving towards enterprise has improved through the provision of online databases	6(15.4)	17(43.6)	8(20.5)	8(20.5)	39	2.54	0.99
	Weighted mean						2.45	
	Decision							low

Table 4.7 shows the relationship between online databases and undergraduate students of Engineering skills acquisition in the libraries studied. Six items were listed for respondents to choose from and the Table 4.7 summarizes their choices. In Federal University, Lokoja, a weighted mean of 2.88 was obtained indicating a high relationship between online databases and skills acquisition. In Federal University of Agriculture

Makurdi, a weighted mean value of 2.55 was obtained, indicating a high relationship between online databases and skills acquisition. In Federal University of Technology, Minna, a weighted mean of 2.83 was gotten, indicating a high relationship between online databases and skills acquisition. In University of Abuja, a weighted mean of 2.25 was gotten, indicating a low relationship between online databases and skills acquisition. In University of Ilorin, a weighted mean of 2.58 was obtained, indicating a high relationship between online databases and skills acquisition of the Engineering students. In University of Jos, a weighted mean of 2.45 was derived, indicating a low relationship between online databases and skills acquisition.

Research question 7: What are the factors militating against skills acquisition of undergraduate students of engineering in libraries of federal universities in North Central, Nigeria?

Table 4.9: Factors Militating Against Skills Acquisition

FUL								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Inadequate awareness of the services provided by the library	13(40.6)	15(46.9)	3(9.4)	1(3.1)	32	3.25	76
2	Inadequate current information resources in the library	13(40.6)	16(50.0)	3(9.4)	0	32	3.31	64
3	Inadequate technical skills to navigate the subscribed databases in the library	12(37.5)	17(53.1)	3(9.4)	0	32	3.38	63
4	Inadequate information dissemination channel by the library	10(31.3)	20(62.5)	2(6.3)	0	32	3.25	57
5	Attitude of library the staff	12(37.5)	17(53.1)	1(3.1)	2(6.3)	32	3.22	79
6	Inadequate Internet facilities to access the online databases in the library	12(37.5)	16(50.0)	4(12.5)	0	32	3.25	67
7	Inadequate power supply in the library	14(43.8)	13(40.6)	4(12.5)	1(3.1)	32	3.25	0.80
8	Shortage of creative work space in the library	11(34.4)	13(40.6)	7(21.9)	1(3.1)	32	3.06	84
9	<u>Unconducive learning environment in the library</u>	11(34.4)	11(34.4)	8(25.0)	2(6.3)	32	2.97	93

Weighted mean								2.76
Decision								high
FUAM								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Inadequate awareness of the services provided by the library	15(30.6)	29(59.2)	0	5(10.2)	49	3.10	0.48
2	Inadequate current information resources in the library	12(24.5)	35(71.4)	0	2(4.1)	49	3.16	0.62
3	Inadequate technical skills to navigate the subscribed databases in the library	14(28.6)	28(57.1)	4(8.2)	3(6.1)	49	3.08	0.78
4	Inadequate information dissemination channel by the library	5(10.4)	32(66.7)	6(12.5)	5(10.4)	49	2.77	0.77
5	Attitude of library the staff	9(18.4)	32(65.3)	3(6.1)	5(10.2)	49	2.92	0.81
6	Inadequate Internet facilities to access the online databases in the library	6(12.2)	29(59.2)	12(24.5)	2(4.1)	49	2.80	0.70
7	Inadequate power supply in the library	4(8.2)	30(61.2)	12(24.5)	3(6.1)	49	2.71	0.70
8	Shortage of creative work space in the library	8(16.3)	28(57.1)	12(24.5)	1(2.0)	49	2.88	.69
9	Unconducive learning environment in the library	5(10.2)	21(42.9)	14(28.6)	9(18.4)	49	2.45	0.91
Weighted mean								2.87
Decision								high
FUT Minna								
S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Inadequate awareness of the services provided by the library	17(23.6)	33(45.8)	14(19.4)	8(11.1)	72	2.82	0.92
2	Inadequate current information resources in the library	12(16.7)	30(41.7)	10(13.9)	20(27.8)	72	2.47	0.07
3	Inadequate technical skills to navigate the subscribed databases in the library	10(13.9)	31(43.1)	13(18.1)	18(25.0)	72	2.46	1.0
4	Inadequate information dissemination channel by the library	11(15.3)	36(50)	13(18.1)	12(16.7)	72	2.64	0.94
5	Attitude of library the staff	12(16.7)	18(25.0)	11(15.3)	31(43.1)	72	2.15	1.16

6	Inadequate Internet facilities to access the online databases in the library	13(18.1)	18(25.0)	13(18.1)	28(38.9)	72	2.22	1.15
7	Inadequate power supply in the library	14(19.4)	15(20.8)	12(16.7)	31(43.1)	72	2.17	1.19
8	Shortage of creative work space in the library	26(36.1)	19(26.4)	18(25.0)	9(12.5)	72	2.86	0.05
9	Unconducive learning environment in the library	17(23.6)	15(20.8)	18(25.0)	22(30.6)	72	2.38	1.16
Weighted mean							2.56	
Decision							low	

Uni Abuja

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Inadequate awareness of the services provided by the library	15(29.4)	18(35.3)	9(17.6)	9(17.7)	51	2.76	1.07
2	Inadequate current information resources in the library	10(19.6)	14(27.5)	15(29.4)	12(23.5)	51	2.43	1.06
3	Inadequate technical skills to navigate the subscribed databases in the library	20(39.2)	10(19.6)	12(23.5)	9(17.6)	51	2.80	1.15
4	Inadequate information dissemination channel by the library	9(17.6)	24(47.1)	8(15.7)	10(19.6)	51	2.63	0.99
5	Attitude of library the staff	5(9.8)	13(25.5)	25(49.0)	8(15.7)	51	2.29	0.85
6	Inadequate Internet facilities to access the online databases in the library	9(17.6)	24(47.1)	8(15.7)	10(19.6)	51	2.63	0.99
7	Inadequate power supply in the library	14(27.5)	14(27.5)	13(25.5)	10(19.6)	51	2.63	1.09
8	Shortage of creative work space in the library	5(9.8)	9(17.6)	13(25.5)	24(47.1)	51	1.90	1.02
9	Unconducive learning environment in the library	5(9.8)	13(25.5)	13(25.5)	20(39.2)	51	2.06	1.02
Weighted mean							2.45	
Decision							low	

Uni Ilorin

S/No	Statements	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Inadequate awareness of the services provided by the library	6(9.2)	12(18.5)	39(60)	8(12.3)	65	2.37	0.95
2	<u>Inadequate current information resources in the</u>	0	12(18.5)	28(43.1)	25(38.5)	65	2.25	0.79

	library								
3	Inadequate technical skills to navigate the subscribed databases in the library	22(33.8)	21(32.3)	12(18.5)	10(15.4)	65	1.80	0.73	
4	Inadequate information dissemination channel by the library	28(43.1)	11(16.9)	12(18.5)	14(21.5)	65	2.85	1.06	
5	Attitude of library the staff	12(18.5)	19(29.2)	20(30.8)	14(21.5)	65	2.82	1.21	
6	Inadequate Internet facilities to access the online databases in the library	20(30.8)	4(6.2)	31(47.7)	10(15.4)	65	2.45	1.03	
7	Inadequate power supply in the library	26(40.0)	21(32.3)	12(18.5)	6(9.2)	65	2.52	1.09	
8	Shortage of creative work space in the library	6(9.2)	11(16.9)	14(21.5)	34(52.3)	65	3.03	0.98	
9	Unconducive learning environment in the library	10(15.4)	12(18.5)	29(44.6)	14(21.5)	65	1.83	1.02	
	Weighted mean						2.43		
	Decision						low		

Uni Jos

S/No	Statement	SA (4)	A (3)	D (2)	SD (1)	n	\bar{x}	StD
1	Inadequate awareness of the services provided by the library	2(5.1)	7(17.9)	14(35.9)	16(41.0)	39	1.89	0.89
2	Inadequate current information resources in the library	6(15.4)	2(5.1)	13(33.3)	18(46.2)	39	1.90	1.07
3	Inadequate technical skills to navigate the subscribed databases in the library	3(7.7)	6(15.4)	18(46.2)	12(30.8)	39	2.00	0.89
4	Inadequate information dissemination channel by the library	8(20.5)	10(25.6)	16(41.0)	5(12.8)	39	2.54	0.97
5	Attitude of library the staff	9(23.1)	4(10.3)	15(38.5)	11(28.2)	39	2.28	1.13
6	Inadequate Internet facilities to access the online databases in the library	9(23.1)	7(17.9)	13(33.3)	10(25.6)	39	2.28	1.11
7	Inadequate power supply in the library	17(43.6)	9(23.1)	10(25.6)	3(7.7)	39	3.03	1.01
8	Shortage of creative work space in the library	5(12.8)	4(10.3)	17(43.6)	13(33.3)	39	2.03	1.75
9	Unconducive learning environment in the library	4(10.3)	6(15.4)	17(43.6)	12(30.6)	39	2.05	0.94
	Weighted mean						2.22	
	Decision						low	

Table 4.9 shows the responses from the 6 federal universities on the factors militating against skills acquisition of undergraduate Engineering students in Federal universities in North central, Nigeria. 9 items were listed for the respondents to choose from.

In Federal University, Lokoja, all the 9 items listed were factors militating against skills acquisition had positive mean values, which means that these factors are a thorn in the flesh of the students in acquiring skills. A weighted mean of 2.97 was obtained, thus indicating that they are challenges encountered by the library. In Federal University of Agriculture, 8 out of the 9 listed items returned positive mean values. That is to say these factors are a challenge in the library. A weighted mean of weighted mean of 2.96 was obtained. In FUT Minna, 3 out of the 9 listed items returned a positive mean value. These items are shortage of workspace and inadequate awareness of library services. A weighted mean of 2.44 was obtained indicating that these challenges have low impact on skills acquisition. In university of Abuja however, 5 out of the 9 listed items posed as the threats encountered by undergraduate Engineering students because they had mean values greater than 2.5 on a 4.0 likert scale. A weighted mean of 2.46 was obtained. . In University of Ilorin, 4 items posed as the threats to skills acquisition because they had mean values of 2.5 and above. A weighted mean of 2.44 was also obtained. In UniJos nonetheless, 2 items returned a mean value of 2.5 and above, meaning they are the challenges standing in the way of a seamless skills acquisition by undergraduate Engineering students. A weighted mean of 2.21 was obtained.

4.3 Hypotheses Testing

H₀₁: There is no significant relationship between the available current awareness services and skills acquisition of undergraduate students of engineering in federal universities in North Central, Nigeria.

Table 4.10: Relationship between the available current awareness services and skills acquisition of undergraduate students of Engineering in federal universities in North Central, Nigeria

Correlations

Variable	N	df	Mean	SD	R	P
current awareness services	311		176.24	38.52		
skills acquisition	311	309	165.13	44.67	0.017**	0.05

**. * Correlation is significant at 0.05 level.

Table 4.10 shows that the correlation coefficient = 0.017 $P < 0.05$ i.e. Critical value R 0.017 is lesser than P 0.05. Therefore, the null hypothesis which states that there is no significant relationship between the available current awareness services and skills acquisition of undergraduate students of engineering in federal universities in North Central, Nigeria is not rejected. This implies that the available current awareness services in the studied university libraries do not affect skills acquisition of the Engineering students studied.

Ho2: There is no significant relationship between information dissemination and skills acquisition of undergraduate students of engineering in federal universities in North Central, Nigeria.

Table 4.11: Relationship between information dissemination and skills acquisition of undergraduate students of engineering in federal universities in North Central, Nigeria

Correlations

Variable	N	df	Mean	SD	R	P
Information dissemination	311		181.22	52.73		
skills acquisition		309			0.086**	0.05
	311		165.13	44.67		

, Correlation is significant at 0.05 level.

Table 4.11 shows that the correlation coefficient = 0.086 $P > 0.05$ i.e. Critical value R 0.086 is greater than P 0.05. Therefore, the null hypothesis which states that there is no significant relationship between online databases and skills acquisition of undergraduate students of Engineering in federal universities in North Central, Nigeria is rejected. This by implication means that information dissemination affects skills acquisition of Engineering students.

H03: There is no significant relationship between online databases and skills acquisition of undergraduate students of engineering in federal universities in North Central, Nigeria

Table 4.12: Relationship between online databases and skills acquisition of undergraduate students of Engineering in federal universities in North Central, Nigeria

Correlations

Variable	N	df	Mean	SD	R	P
Online databases	311		169.15	49.66		
		309			0.159**	0.05
Skills acquisition	311		165.13	44.67		

** Correlation is significant at 0.05 level.

Table 4.12 shows that the correlation coefficient = 0.159 $P > 0.05$ i.e. Critical value R 0.159 is greater than P 0.05. Therefore, the null hypothesis which states that there is no significant relationship between online databases and skills acquisition of undergraduate students of Engineering in federal universities in North Central, Nigeria is rejected. This depicts that online database influences skills acquisition of undergraduate Engineering students.

4.4 Summary of the Findings

The summary of the findings are as follows:

1. The study revealed that there are online databases available in the libraries studied. These are Ebscohost, Science Direct, Denary, ProQuest, elsvier Science Direct, OMICS International, IEEE, Hinary, Oxford Academic Journal, ACM

Digital Library, JSTOR, DATAD, IMF E-library, AGORA, Bio One online, IMF E-library, Questia, TEEAL, E-Granary and CORE.

2. The study also revealed the level of undergraduate engineering students' skills acquisition is greatly impacted by the provision of online database, Current awareness services and information dissemination. The undergraduates acquire modelling, curiosity, ICT and entrepreneurial skills through the deployment of OPAC, SMS services, bulletins, AJOL and so on.
3. The libraries studied have unique methods used in carrying out current awareness services. Some of these methods used are SDI, google alert, listing of new resources, SMS, news clippings, posters, bulletin boards, shelf display and through their websites. On the other hand, the methods used in disseminating information in the libraries studied are through the use of bulletins, from the libraries' websites, online reference services, emails, film/video and through radio/television.
4. The study also revealed the relationship between skills acquisition of undergraduate students of Engineering and current awareness services. It can be seen that libraries with a good current awareness service made it easier for their undergraduate engineering clientele to acquire skills. Equally the studied libraries with good online database subscription and good information dissemination channels also enjoyed the same feat.
5. Similarly, the study revealed the relationship between skills acquisition and information dissemination. The undergraduate engineering students acquired both technical and non-technical skills through the use of information dissemination services.

6. The relationship between skills acquisition and online database service was also exposed through this study. The study revealed that through the provision of information dissemination services, the engineering undergraduates acquired modelling, structural and entrepreneurial skills
7. Despite the availability of these databases and different techniques used by the libraries to carry out CAS and disseminate information, the attitude of library staff, poor reading environment still stands as a threat in some of these libraries. The shortage of funds is another major reason why the library studied cannot acquire some of the basic necessities needed for a fully functional library geared towards skills acquisition of undergraduate students of engineering.
8. The study revealed a positive relationship between Current Awareness Services and Skills acquisition, meaning that a good current awareness service would bring about high rate of skills acquisition amongst undergraduate students of engineering.
9. The study also revealed a positive relation between information dissemination and skills acquisition of undergraduate Engineering students. That is to say that a good information dissemination channel would boost the skills acquisition of undergraduate students of Engineering.
10. Online databases were also fingered to have a positive relationship with skills acquisition.

4.5 Discussion of the Findings

From Table 4.2, it that Federal University of Technology, Minna had the highest number of copies of questionnaire administered and the highest response rate. This could be tied to the fact that the institution and the library is the researcher's repository.

The study also revealed that most of the respondents were males and this can be tied to the fact that engineering is considered to be a man's profession and so, there exists a natural affinity for the course against women. This assertion is further validated by Bossert, J and Bharti, N. (2018) who affirmed that a natural stereotype exists among women in Engineering and this stereotype comes into play when male engineers are given precedence for jobs against the women, thus discouraging the female youngsters who have a passion for engineering. From the table, most of the respondents were selected from 200,300 and 500 levels. The researcher deliberately reduced the questionnaire to be administered to the 100L students because she believes that at this stage, they may not be properly enlightened and motivated to use the library. Engineering undergraduates at 100L moreover, are exposed to mainly mathematics against engineering courses.

The result of the analysis on the availability of online databases shows that OARE, AJOL, HINARY, Elsevier Science Direct, Agora and Ebscohost were the databases with the highest subscription rate as indicated in Table 4.3. Also, university of Jos has the highest number of databases and this is closely followed by the Federal University of Technology, Minna. Could these databases be the reason why these libraries enjoy high patronage? This makes sense because Elsevier, Science Direct and AGORA are detailed online databases. They are also easy to navigate and use.

The findings from the data gathered from this research question reveals level of skills acquisition of students of Engineering studied. The analyses of the responses show that information dissemination, current awareness services and online databases are important in the skills acquisition of undergraduate students of engineering. That is to

say that the availability of these services would positively impact skills acquisition and the non availability would pose a risk to skills acquisition.

The result of the analysis on the methods used for information dissemination shows that the use of OPAC, self service, the use of website and online reference services all have an average high mean value in the institutions studied. Outreach programme, quick response code, workshop and films and radio sensitization all had a collective low mean value in the institutions studied. A lot of factors can be tied to this discrepancy, the main reason could be the inadequacy of funds. These libraries barely have enough to renew their online database subscriptions, acquire latest information resources, how much more paying for radio sensitization, organizing workshops, outreach programmes and configuration for QR codes. That is to say, if libraries are funded better, there would be a great improvement in service delivery, thereby, making skills acquisition of undergraduate students of Engineering more tenable.

Similarly, the result of the analysis on the methods used for current awareness services shows that the libraries studied were more inclined towards using SDI, library bulletins, notice boards, listing of new resources, bulletin boards and shelf display. This is likely because these methods are more cost effective and easy to implement compared to google alert, subject bibliography on demand and news clipping services Unegbu (2013).

The result of the analysis on the relationship between information dissemination and skills acquisition of undergraduate students of Engineering reveals that they have an average high mean values. That is, the undergraduate Engineering students in the institutions studied are acquiring technical, entrepreneurial, innovative, problem-solving, ICT, coding, project management, modelling and curiosity skills from the

information dissemination services rendered by the libraries. That is to say that information dissemination is a vital tool in enables skills acquisition among undergraduate students of Engineering in federal universities in North Central, Nigera. This is why Fagbola, Uzoigwe and Ajegbomogun (2011) opined that information dissemination is key in libraries and the proliferation of ICT has made it more robust. Thus, if the libraries studied can adopt more ICT-inclined information dissemination techniques, skills acquisition among undergraduate students of Engineering would be faster and easier to achieve.

The findings from the data gathered showed that Current Awareness Services is a veritable tool for the acquisition of skills among undergraduate Engineering students. They use library tools such as google alert,new arrivals, shelves display, bulletin and bulletin board to mention but a few, to acquaint themselves with latest holdings on as it relates to their information needs. No wonder why Naqvi (2013) and Chutia (2015) posited that librarians then should be more proactive in providing Current Awareness Services to its clientele. The proactiveness of Current Awareness Services would bring make skills acquisition easy and smooth for undergraduate Engineering students.

The findings from the data gathered revealed that the relationship between online databases and skills acquisition of the studied students is linear. A major chunk of the respondents from the institutions studied agreed that databases are key in their skills acquisition. This shows that a library with a rich collection of online databases would expose its undergraduate students of Engineering to the possibilities of a seamless skills acquisition. Reason why Samaravickrama and Samaradiwakara (2014) opined that the impact of online databases on academic libraries and undergraduate students is noteworthy and unprecedented. The possibilities that online databases provide is the

reason why libraries are going digital, which has proven to be cheaper in the long run (Madhusudhan, 2010).

Militating factors against skills acquisition of undergraduate students of Engineering as discussed in this study are hindering institutions such as Federal University, Lokoja, Federal University of Agriculture, Makurdi and University of Abuja from providing a top-class library facility that would boost skills acquisition among undergraduate students of Engineering. That is to say these factors are a great setback to skills acquisition among undergraduate students of Engineering. For instance Akinwale (2010) posited that poor electrical power supply affects the provision of electronic and online resources, which affects the skills acquisition of undergraduate students of Engineering. Poor electrical power supply and other problems such as poor facilities, inadequate reading spaces cannot be addressed due to lack of funds. If the libraries can improve on these problems, it means that more undergraduate students of Engineering would be encouraged to use the libraries, as well as improving their skills.

Federal University of Technology, Minna, University of Jos and University of Ilorin all had a low average mean values which shows that the undergraduate students of Engineering in these institutions are satisfied with their libraries' facilities and services and perhaps, that could be the reason for the rich patronage these libraries enjoy.

The test of null hypothesis one shows that the results obtained in the relationship between the available current awareness services and skills acquisition led to the rejection of the hypothesis. Table 4.10 shows the impact Current Awareness Services have on skills acquisition, with the value of P-Value at 0.05. This implies that CAS have a less impact on skills acquisition and if libraries need to boost skills acquisition of undergraduate students of Engineering, all they have to do is to boost skills acquisition.

This is why Naqvi,2013 said all libraries should be proactive in the provision Current Awareness Services.

The test of null hypothesis two shows that the result of the data collected on the link between information dissemination and skills acquisition of undergraduate students in North central, Nigeria indicated that the hypothesis is rejected. This study shows that information dissemination has on undergraduate students of Engineering skills acquisition. This is why Fagbola, Uzoigwe and Ajegbomogun (2011) opined that information dissemination is key to a robust library functionality.

The test of null hypothesis three shows that the result of the data collected on the relationship between online databases and skills acquisition of undergraduate students of engineering in federal universities in North central, Nigeria led to the rejection of the hypothesis. The study shows the impact posed by online databases on skills acquisition of the studied students. Therefore, the libraries studied should endeavor to subscribe to more online databases in order to boost skills acquisition of undergraduate students of Engineering. It was on this basis that Samaravickrama and Samaradiwakara (2014) said that the impact of online databases to libraries is second to none.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings of the study, one can deduce that the availability of online databases is a catch for undergraduate students Engineering use of library. The researcher observed that the libraries with the highest number of online databases actively subscribed to enjoy good clientele patronage. The availability of these databases also aides in the skills acquisition of undergraduate students of Engineering. Also the deployment of Current Awareness Services and Information Dissemination tools further aides in the skills acquisition of undergraduate students of Engineering. Despite all of these availability, only 4 out of the 6 libraries studied enjoy high clientele patronage and this factor is tied to the attitude of the library staff, lack of conducive environment and so on.

5.2 Recommendations

The following recommendations were proffered by the researcher

1. The management of the libraries studied should make concerted efforts in acquiring useful and rich online databases such as AGORA, Science direct, Dinary and IEEE, targeted at the skills acquisition of undergraduate students of Engineering. This would enable the students have access to a wide variety of information resources and services simultaneously.
2. The library management should work towards making their libraries a skills acquisition hub. This would be achieved when the relevant databases are acquired and regularly updated. Current awareness and information dissemination services can also be improved to make this a success.

3. The libraries studied should work towards boosting their channels of information dissemination. With the proliferation of ICT, these channels can be made to be smooth and seamless. . The library management should get more creative in their methods of disseminating information to its clientele. The world is evolving, so it is important that the libraries encounter a paradigm shift in some of its services. For instance, Libraries can deploy more frequently, email and telephone services in disseminating information. They can also encourage their clienteles to create a user profile and once that is done, the users can be frequently updated on that is new in their added choice of field. This, as a matter of fact can go beyond the holdings of the libraries. This means that the reference unit can carry out researches and channel relevant information to clienteles as it relates to their information needs.
4. The library management should encourage the use of social media, email and telephony services and so on in informing students on its current resources and services. This flexibility would aide undergraduate engineering students in knowing what the library has and how to access them.
5. The libraries studied should also work towards improving their current awareness services. More ICT-inclined channels of awareness should be deployed.
6. The library management should subscribe to more databases and keep their subscriptions up to date. An expired database is as good as useless. The study and literature reviewed have shown how useful this can be in the proliferation of skills for undergraduate engineering students
7. The management of each of these libraries should make a conscious effort in training their staff on customer relation. This is important because relating with

library users with courtesy and respect would endear them to visit again. It would also give them the boldness to approach the library staff if they need help using an online databases or in locating an information resource, thereby leading to the acquisition of skills. The institutions studied should also I crease the budgetary allocation of their libraries. An engineering undergraduate can only acquire 20 percent of the skills he requires from the classroom. The remaining 80 percent is earned from self-development, made possible by the library. Thus, it is imperative for the university management to channel more funds to the libraries to make the provision of information dissemination, current awareness and online database services a great success.

8. The management of the studied libraries should scheme out measures to maintain the positive relationship between information dissemination and skills acquisition. This positive relationship should be a wake-up call for university management to boost their information dissemination techniques. The proliferation of ICT has opened so many possibilities in this field
9. The positive relationship between online databases and skills acquisition shows that the library management need to beef up their online database haul in order to key into the potentials of boosting skills acquisition of undergraduate engineering students
10. The positive relationship between Current Awareness Services and Skills acquisition shows that library management need to profer policies that would boost their current awareness services techniques.

5.3 Contribution to Knowledge

The study contributes to knowledge in the following areas:

1. The study revealed that through libraries dissemination of information through various media available in the library, the undergraduate Engineering students acquired skills that have aided them for their self-development in the society.
2. The study revealed that libraries carry out Current Awareness Services as well as online database services through the use of library bulletins shelf guides, websites; the provision of Proquest, JStor, Elsevier and Science Direct for undergraduate of engineering skills acquisition.
3. The study is a great addition to the frontier of knowledge on library services vis-a-viz skills acquisition of undergraduate students of engineering.

5.4 Suggestion for Further Studies

This study was on Information Dissemination, Current Awareness Services and Online Databases as facilitators of undergraduate Engineering students' skills acquisition in federal universities in North Central, Nigeria. It is therefore necessary to suggest a similar research on information dissemination, CAS and online databases as facilitators of undergraduate students of engineering skills acquisition in Western Nigeria.

An assessment of information dissemination, CAS and online databases as facilitators of undergraduate students of Engineering skills acquisition in Federal Universities in Nigeria.

An assessment of information dissemination, Current Awareness Services and online databases as facilitators of undergraduate students' of Engineering skills acquisition in private universities in North central Nigeria.

REFERENCES

- Abdullah, N. H., Shamsuddin, A. & Wahab, E. (2012). The Influence of Transformational Leadership on Product Innovations among Small Business. International Conference on Technology Management, Business and Entrepreneurship (ICTMBE),18-19.
- Abubakar, M. S. & Akor, P. U. (2017). Availability and utilization of electronic information databases for research by agricultural scientists in federal university libraries in North Central Nigeria. *Library Philosophy and Practice* (e-journal), 1600. <http://digitalcommons.unl.edu/libphilprac/1600>
- ACRL (2006). Changing Roles of Academic and Research Libraries. Available at: <http://www.ala.org/acrl/issues/value/changingroles>
- Adeodu, A., Daniyan, I., Omohimoria, C. & Afolabi, S. (2017). Development of indigeneous Engineering and technology in Nigeria for sustainable development through promotion of smes (case of design of manually operated paper recycling plant). *International Journal of Science, Technology and Society*. 3(4), 124-131. doi: 10.11648/j.ijsts.20150304.15
- Agcaoili, C.C. & Resurrection, A.P. (2006). *Library administration and information management*. [Manila]: National Commission for Culture and Arts.
- Agyen-Gyasi, K., Lamptey, R. & Frempong, A. (2010). Academic Librarians' role in maximizing use in Ghana In Thompson, E.S. & Kofi, C.Y. (eds). Proceedings of the 7th Seminar of the Committee of University Librarians and their Deputies, Academic and Research Libraries in Transition. Tamale: CULD, 114-125. (http://www.uds.edu.gh/docs/culd_proceedings.pdf)
- Akpan-Atata, E. & Enyene, E. T. (2014) Awareness, Availability and Utilization of ICT Facilities for Effective Service Delivery in Academic Libraries in Nigeria. *Journal of Research in Education and Society*, 5 (3), 10-19.
- Akpo, A. C. & Oliver, A. C. (2019). Influence of institutional variables on employability skills acquisition among business education students in tertiary institutions in Cross River State, Nigeria. *International Journal of Vocational and Technical Education Research*, 5(1), 1-12.
- Akussa, M., Asante, E. & Adu-Sarkodee, R. (2015). Impact of electronic resources and usage in academic libraries in Ghana: Evidence from Koforidua polytechnic and All Nations University College, Ghana. *Journal of education and practice*, 6 (33). Retrieved from <https://files.eric.ed.gov/fulltext/EJ1083497/>
- Aleksandrov, K., Schubert, V. & Ovtcharova J. (2014). *Skills-Based Asset Management: A PLM-Approach for Reconfigurable Production Systems*. In Fukuda S., Bernard A., Gurumoorthy B., Bouras A. (eds) *Product Lifecycle Management for a Global Market*,42.
- Alpay, E., & Jones, M. E. (2012). Engineering Education in Research-intensive Universities. *European Journal of Engineering Education*, 37 (6), 609–626.

- Anasi, S. N., Ukangwa, C. C. & Fagbe, A. (2017). University libraries-bridging digital gaps and accelerating the achievement of sustainable development goals through information and communication technologies. *World Journal of Science, Technology and Sustainable Development*, <https://doi.org/10.1108/WJSTSD-11-2016-0059>
- Andrianaivo, M., & Kpodar, K. (2011). *ICT, Financial Inclusion, and Growth: Evidence from African Countries*. Washington, D.C.: International Monetary Fund.
- Aneke S. O., & Ezugwu, A. O. (2018). Skills Acquisition: An E-Learning Approach. *IOSR Journal of Computer Engineering (IOSR-JCE)*, 20(5), 61-66.
- Anyira, I. E. (2011). The anatomy of library users in the 21st century. *Library Philosophy and Practice (e-journal)*. Retrieved January 20, 2020, from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1566&context=libphilprac>
- Bandura, A. (1965). Influence of models' reinforcement contingencies on the acquisition of imitative responses. *Journal of personality and social psychology*, 1(16), 589.
- Bandura, A. (1977). Self-efficacy: towards a unifying theory of behavioural change. *Psychological review*, 84(2), 191.
- Barnhart, F. D., & Pierce, J. E. (2011). Becoming mobile: Reference in the ubiquitous library. *Journal of Library Administration*, 51(3), 279-290.
- Bell, S. (2012). Students tweet the darndest things about your library—and why you need to listen. *Reference Services Review*, 40(2), 217-220.
- Betz, N. E. (2007). Career self-efficacy: Exemplary recent research and emerging directions. *Journal of Career Assessment*, 15(4), 403-422.
- Bossart, J. L., & Bharti, N. (2018), Board 93: Ten Ways Academic Libraries Can Help their Departments Increase Retention of Women Engineering Students Paper presented at 2018 ASEE Annual Conference & Exposition , Salt Lake City, Utah. 10.18260/1-2--30139
- Butt, K., Qutab, S. & Mahmood, K. (2011). Access and use of the Internet in the libraries of Lahore, Pakistan. *Chinese Librarianship: an International Electronic Journal*, 31. Accessed from URL: <http://www.iclc.us/cliej/cl31BQM.pdf>
- Cabonero, D. A., Tindaan, C. B., Attaban, B. H., & Manat, D. A. (2019). The effectiveness, reasons and problems in current awareness services in an academic library towards crafting an action plan. *Library Philosophy and Practice*, 2493, pp.1-27. <https://digitalcommons.unl.edu/libphilprac/>
- Cherry, K. (2009). Survey Psychology Definition of the Week. About.com. Retrieved 18th May, 2019.
- Chowdury, G. G. (2010). *Introduction to modern information retrieval (3rd ed)*. London: Facet publishing.

- Chutia, U. P. (2015). Academic libraries of 21st century: Challenges for librarian. *Knowledge Librarian (e-journal)*, 2(4). Retrieved January 17, 2020, from <http://www.klibjlis.com/2.4.15.pdf>
- Concept Publications Limited.
- Conde-Caballero, D., Castillo, C. A., Ballesteros-Yáñez, I., & Mariano-Juárez L. (2019). Blogging as a tool for the acquisition and dissemination of knowledge in health sciences: a preliminary evaluation. *International Journal of Educational Technology in Higher Education*, 16(30), pp. 1-15.
- Databases. (2012). In J. M. Reitz (Ed.), *Online Dictionary for Library and Information Science* (ODLIS). Retrieved from http://www.abcclio.com/ODLIS/odlis_d.aspx#database
- Delponte, L., Grigolini, M., Moroni, A., Vignetti, S., Claps, M., & Giguashvili, N. (2015). ICT in the developing world. Scientific Foresight Unit. doi:10.2861/52304
- Dongardive, P. (2013). Information repackaging in library services. *International Journal of Science and Research (IJSR)*, 2 (11), 2319-7064. Retrieved from <https://www.ijsr.net/archive/v2i11/MDIwMTM0MDM=.pdf>
- English Dictionary, C. E. (2003). Complete and unabridged.
- Eze, P. I. (2016). Influence of educational technology centres on students' skills acquisition for self-employment. *Journal of Education and Practice*, 7(5), 88-95
- Fagbola, O., Uzoigwe, C., & Ajegbomogun, V. O. (2011). Libraries driving access to knowledge in the 21st century in developing countries: An overview. *Library Philosophy and Practice (e-journal)*. Retrieved from <https://www.webpages.uidaho.edu/~mbolin/fagbola-uzoigwe-ajegbomogun.html>
- Fortune, S. (2014). A brief history of databases. Retrieved from <https://avant.org/project/historyof-databases/>
- Green, M., & Piel, J. A. (2009). *Theories of human development: A comparative approach* (second ed.): Prentice-Hall, Inc.
- Guha, B. (2015). Indian current awareness services. *Unesco Bull library*, 22 (2), 73-81.
- Guzman, Y.C., Chapichap, B.B., Bastian, R.P., Las Marias, R.D., Somerbang, H., Umaking, L.T & Allan, J.S. (2015). Effectiveness of current awareness services of the University of the Cordilleras Libraries. Libraries, University of the Cordilleras Baguio City, Philippines. Retrieved from <http://www.ucbcf.edu.ph/Images/Library/Research/2014/Effectiveness%20of%20Current%20Awareness%20Services%20of%20the%20University%20of%20the%20Cordilleras%20Libraries%202014.pdf>
- Ifukor, M. O. (2013). Channels of information acquisition and dissemination among rural dwellers. *International Journal of Library and Information Science*, 5(10), pp. 306-312.

- Igbokwe, J. U. (2012). Strategies to enhance effective marketing of services in University libraries in Nigeria. Unpublished MLS Thesis, Department of Library and Information Science, University of Nigeria, Nsukka
- Iroaganachi, M. A., & Izuagbe, R. (2018). Access to online databases: predicate for faculty research output. *Library Philosophy and Practice*, 1-21.
- Johnson, S. M., Osmond, A. & Holz, R. J. (2009). Developing a current awareness service using Really Simple Syndication (RSS). USA: Journal of the Medical Library Association Vol. 97 (1): 52-54.
- Khan, S. A., & Bhatti, R. (2012). A review of problems and challenges of library professionals in developing countries including Pakistan. *Library Philosophy and Practice (e-journal)*. Retrieved January 19, 2020, from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1831&context=libphilprac>
- Kopal, O. (2015). History and trends in the development of databases. Retrieved from <http://www.web-integration.info/en/blog/history-and-trends-in-the-development-ofdatabases/>
- Kozma, R. B., & Vota, W. S. (2014). *ICT in developing countries: Policies, implementation, and impact*. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), Handbook of research on educational communications and technology (pp. 885-894). New York: Springer.
- Kpakiko, M. M. & Shehu, N. (2013). Blog technology: A reference service tool for Nigerian university libraries and information centres. Calabar: Continental journal of innovations and sustainable development Vol. 1 (1)
- Kpakiko, M. M., Suleiman, H. & Abubakar, F. (2018). Awareness and Use of Current Awareness Services by Users of Three University Libraries in North West Nigeria. *Journal of Applied Information Science and Technology*, 12 (3), pp.43-51.
- Krejcie, R. V. & Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement* 30 (3), 607-61
- Kumar, A. (2014). Students opinion about the success of mobile technology in libraries: A case study of Jawaharlal Nehru University (JNU), New Delhi. *New Library World*, 155(9/10), 471 - 481.
- Laker, D. R., & Powell, L. M. (2011). The Differences Between Hard and Soft Skills and their Relative Impact on Training Transfer. *Human Resource Development Quarterly*, 22 (1): 111–122.
- Larson, R.R. (2010). Information retrieval systems. In M. J. Bates (Ed.), *Encyclopedia of Library and Information Science* (3rd ed.), 4, 2533-2563. Bora Raton: CRC Press
- Leatherman, C. C. & Eockel, E. J. (2012). *The use of online current awareness services by national sciences and Engineering faculty at Western Michigan University*. USA: Science and technology librarianship.

- Library success. (2014). *M-Libraries*. Retrieved from libsuccess.org: http://libsuccess.org/index.php?title=M-Libraries#SMS_notification_services
- Lippincott, J. K. (2010). A mobile future for academic libraries. *Reference Services Review*, 38(2), 205-213.
- Liu, Y. Q., & Briggs, S. (2015). A Library in the palm of your hand: Mobile services in top 100 University libraries. *Information Technology and Libraries*, 133-148. doi: doi:10.6017/ital.v34i2.5650
- Madhusudhan, M. (2010). Use of electronic resources by research scholars of Kurukshetra University. *The Electronic Library* 28(4):492-506.
- McLeod, S.A. (2016). Bandura- Social learning theory. Simple psychology. Retrieved from <https://www.simplepsychology.org/bandura.html>
- Mery, Y., DeFrain, E., Kline, E., & Sult, L. (2014). Evaluating the effectiveness of tools for online database instruction. *Communications in Information Literacy*, 8(1), pp. 70-81.
- Nalluri, S. R. & Gaddam, B. (2016). Mobile library services and technologies: A study. *International Journal of Research in Library Science*, 2(2), 59-66.
- Namugera, L. (2014). Users' awareness, perceptions and usage of Makerere library services in the main and selected branch libraries. *Qualitative and Quantitative Methods in Libraries*, 3, 741-758. Retrieved from http://www.isast.org/images/QQML2014_Program_FINAL_Updated.pdf
- Naqvi, T. H. (2013). Current awareness services: A case study of the CBHTS Nasinu Library at Fiji National University. *Chinese Librarianship: An International Electronic Journal*, 35. Retrieved from <http://www.iclc.us/cliej/cl35naqvi.pdf>
- Naqvi, T. H. (2013). Current awareness services: A case study of the CBHTS Nasinu Library at Fiji National University. *Chinese Librarianship: An International Electronic Journal*, 35. Retrieved from <http://www.iclc.us/cliej/cl35naqvi.pdf>
- Naqvi, T. H. (2013). Current awareness services: A case study of the CBHTS Nasinu Library at Fiji National University. *Chinese Librarianship: An International Electronic Journal*, 35. Retrieved from <http://www.iclc.us/cliej/cl35naqvi.pdf>
- National Quality Council (2006) Newsletter, issue no. 1, viewed 9 March 2012, <<http://www.dest.gov.au/NR/rdonlyres/7CE26613-EBAD-470D-A9C09B41203E2819/14486/QualityCouncilFocusNewsletterIssue01.pdf>>.
- Negi, D. S. (2014). Using mobile technologies in libraries and information centers. *Library Hi Tech News*, 31(5), 14-16.
- Ngessa, V. (2018). User challenges and top used online databases: A survey of higher education institutions in Tanzania. *International Journal of Academic Research in Business and Social Sciences*, 8(5), 386-400.

- Nisonger, T. E. (2003). Evaluation of library collections, access and electronic resources: a literature guide and annotated bibliography (1st ed.), Libraries Unlimited.
- Nnadi, C. (2014). Entrepreneurship development and its impact on small scale business enterprises in developing countries: A Nigerian experience. *Journal of Entrepreneurship & Organization Management* 3, 119doi: 10.4172/2169-026X.1000119
- Ntlotlang, T. & Grand, B. (2016). The role of libraries in the dissemination of health information in Botswana. *Library Review*, 65(4/5), pp. 320 – 349
- Ogbu, J. E. (2015). Impact of siwes on electrical technology education students' skills acquisition. *Journal of Natural Sciences Research*, 5(22), 54-60.
- Okwelle, P. C. & Ojotule, D. I. (2018). Constraints to students' effectiveness in practical skills acquisition in technical colleges in Kogi State, Nigeria. *International Journal of Innovative Scientific & Engineering Technologies Research*, 6(1), 1-9.
- Olanlokun, S. O. & Salisu, T.M. (2014). Understanding the library: a handbook on library use. Lagos:
- Online database. (2012). In *Law Dictionary* (Black's Law Dictionary). Retrieved from <http://thelawdictionary.org/online-database/>
- Prabhakaran, A., & Kalyani, K. (2014). The thumb generation: ICT application in libraries. *Journal of Library, Information and Communication Technology (JLICT)*, 6(1-2), 42-47
- PubMed. (2017). PubMed Mobile. Retrieve from NCBI: <https://www.ncbi.nlm.nih.gov/m/pubmed/>
- Rossouw, T., & Fourie, I. (2007). Current awareness services (CAS) available via the World Wide Web (WWW) in respect of legal information. *Mousaion*, 25(1), 66-81.
- Rouse, M. (2016). Internet of Things (IoT). Retrieved January 15, 2020, from TechTarget.com: <http://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT>
- Samaravickrama, P. G. R., & Samaradiwakara, A. (2014). Predicting faculty member adoption of online databases by Diffusion Theory approach: case study at the University of Sri
- Saxena, A., & Yadav, R. (2013). Impact of mobile technology on libraries: A descriptive study. *International Journal of Digital Library Services*, 3(4), 1-58.
- Singh, N. K., & Mahajan, P. (2014). Application of RFID technology in libraries. *International Journal of Library and Information Studies*, 4(2), 1-9.
- Sodhi, M.S. (2005). Information science in libraries. Delhi: Adyayan publishers and distributors.

- Tague-Sutcliffe, J. (2010). Information Retrieval Experiment (ELIS Classic). In M. J. Bates (Ed.), *Encyclopedia of Library and Information Science* (3rd ed.) 5, 2526-2533. Bora Raton: CRC Press.
- Unegbu, V. E. (2013). *Current awareness services and selective dissemination of information: needs and techniques in this technological era*. In : Issa, A. O., Igwe, K. N. and Uzuegbu, C. P. (eds.) *Provision of library and Information Services to users in the era of globalization*. Lagos: Waltodanny Visual Concept.
- Uzohue, C. E., & Yaya, J. A. (2016). Provision of current awareness services and selective dissemination of information by medical librarians in technological era. *American Journal of Information Science and Computer Engineering*, 2(2), 8-14.
- Verma, N. K., & Verma, M. K. (2014). Application of mobile technology in the Libraries. In M. Singh, P. K. Singh, & A. Kumar (Ed.), *Libraries: Towards digital paradigm* (pp. 32-38). Uttar Pradesh: Bharati Publishers & Distributers.
- Vollmer, T. (2010). Libraries and mobile technology: An introduction to public policy considerations. *ALA Office for Information Technology Policy*, 3.
- Wang, C., Ke, H., & Lu, W. (2012). Design and performance evaluation of mobile web services in libraries: A case study of the Oriental Institute of Technology Library. *The Electronic Library*, 30(1), 33-50
- Whitehall, T. (2013). Practical current awareness service from Libraries (SDI-selective dissemination of information (SUNRISE)). www.sunrisepage.com/library/sdi.htm. Wilcox, D, Adult, P. and Agee,
- Xie, I. (2010). Information searching and search models. In M. J. Bates (Ed.), *Encyclopedia of Library and Information Science* (3rd ed.) 4, 2592-2603. Bora Raton: CRC Press.

APPENDIX A

QUESTIONNAIRE FOR UNDERGRADUATE STUDENTS OF Engineering

Department of Library and Information Technology,
School of Information and Communication Technology,
Federal University of Technology, Minna.
Niger State.

Dear Respondent,

I am a postgraduate student of the Department of Library and Information Technology, Federal University of Technology, Minna with matriculation number MTECH/SICT/2018/8120. I am currently conducting a research titled “Information Dissemination, Current Awareness Services and Online Databases as Facilitators of Undergraduate Students of Engineering for Skills Acquisition in Federal Universities in North Central, Nigeria.” Please kindly complete the attached questionnaire as your kind response will be appreciated and any information provided will be treated as confidential as possible and will be used for research purpose alone.

Thank you.

Yours faithfully,

Jonathan, Pwanbodi Juliet

MTECH/SICT/2018/8120

Section A: DEMOGRAPHIC DATA

Name of institution:

Department:

Level: 100 { } 200 { } 300 { } 400 { } 500 { }

Gender: Male { } Female { }

Research question 1: What are the online databases services in the libraries in federal universities in North Central, Nigeria?

Section B: Online databases available in your library

S/No	Online Databases	A	NA
1	ProQuest		
2	JStor		
3	Science Direct		
4	Web Science		
5	IEEE explore digital library		
6	Project Muse		
7	Emerald		
8	Ebsco-host		
9	Medline		
10	Others (specify):		

Key: A: Available, NA: Not Available

Research question 2: Level of skills acquisition

Section C: what is the level of skills acquisition

S/NO	Statements	VH	H	L	VL
1	My level of entrepreneurial skills has improved through the provision of online databases				
2	My level of curiosity skills has improved through the provision of library services.				
3	My level of creativity skills has improved through the				

	provision of CAS in the library				
4	My level of innovation skills has improved through the availability of online databases				
5	My level of technology skills has improved through information dissemination services				
6	My level of acquiring knowledge has improved through information dissemination services				
7	My driving towards enterprise has improved through CAS in the library				
8	Others (please specify)				

Key: VH: Very high H: High L: Low VL: Very low

Research question 3: What are the methods used for information dissemination, current awareness services and online databases in libraries for skills acquisition?

Section D: Methods used for information dissemination, current awareness services and online databases in libraries for skills acquisition

INFORMATION DISSEMINATION					
S/N	Statements	SA	A	D	SD
1	The library uses Online Public Access Catalogues to disseminate information for my skills acquisition				
2	The library provides self-service platform for management of information for my skills acquisition				
3	The library uses outreach programs to disseminate information tailored for my skills acquisition				
4	The library uses workshop and seminar to disseminate information to me				
5	The library uses Quick Response codes to disseminate information to me				
6	The library uses its website to disseminate information to me				
7	The library uses online reference services to disseminate information to me				
8	The library disseminates information to me through film/video				
9	The library disseminates information to me through radio/television				
	Others (please specify)				

CURRENT AWARENESS SERVICE(CAS)					
S/NO	Statements	SA	A	D	SD
1	The library creates awareness through Selective Dissemination of Information				
2	The library creates awareness through google alert				
3	The library creates awareness through library bulletins and newsletters				
4	The library creates awareness through notice boards				
5	The library creates awareness through listing of new resources				
6	The library creates awareness through subject Bibliography on demand				
7	The library creates awareness through its website				
8	The library creates awareness through E-mail and telephone services				
9	The library creates awareness through news clipping services				
10	The library creates awareness through SMS				
11	The library creates awareness through Poster and fliers				
12	The library creates awareness through Bulletin boards				
13	The library creates awareness through Shelf display				
14	Others (please specify)				
ONLINE DATABASES					
S/NO	Statements	SA	A	D	SD
1	The library subscribes to ProQuest database				
2	The library subscribes to JSTOR				
3	The library subscribes to Emerald				
4	The library subscribes to Science Direct				
5	The library subscribes to Academic Videos Online				

6	The library subscribes to Scopus				
7	The library subscribes to Educational Research Abstracts Online (ERA)				
8	The library subscribes to EBSCO				
9	The library subscribes to IEEE explore digital library				
10	The library subscribes to project muse				
11	Others (please specify)				

Key: SA: strongly agreed A: agreed D: disagreed SD: strongly disagreed

Research question 4: What is the relationship between information dissemination and skills acquisition in libraries of federal universities in North Central, Nigeria?

Section E: Relationship between information dissemination and skills acquisition

S/NO	Statements	SA	A	D	SD
1	Through information dissemination, I have acquired technical skills				
2	Through information dissemination, I have acquired entrepreneurial skills				
3	Through information dissemination, I have acquired leadership skills				
4	Through information dissemination, I have acquired Problem-solving skills				
5	Through information dissemination, I have acquired innovative skills				
6	Through information dissemination, I have acquired ICT skills				
7	Through information dissemination, I have acquired coding skills				
8	Through information dissemination, I have acquired project management skills				
9	Through information dissemination, I have acquired modelling skills				
	Through information dissemination, I have acquired curiosity skills				
10	Others (please specify)				

Key: SA: strongly agreed A: agreed D: disagreed SD: strongly disagreed

Research question 5: what is the relationship between Current Awareness Services (CAS) and undergraduate students of Engineering skills acquisition in libraries of federal universities in North Central, Nigeria?

Section F: Current awareness services versus skills acquisition

S/NO	Statements	SA	A	D	SD
1	Through CAS such as google alert, the library improves my skills acquisition.				
2	Through CAS such as new arrivals, the library improves my skills acquisition,				
3	Through CAS such as shelve display, the library improves my skills acquisition.				
4	Through CAS such as bulletin and bulletin board, the library improves my skills acquisition.				
5	Through CAS such as posters and fliers, the library improves my skills acquisition.				
6	Through CAS such as email, the library improves my skills acquisition.				
7	Through CAS such as SMS, the library improves my skills acquisition.				
8	Through CAS such as library websites, the library improves my skills acquisition.				
9	Through CAS such as social media like Facebook, Instagram and twitter, the library improves my skills acquisition.				
10	Through CAS such as library website, the library improves my skills acquisition.				
11	Others (please specify)				

Key: SA: strongly agreed A: agreed D: disagreed SD: strongly disagreed

Research question 6: What is the relationship between online databases and undergraduate students of Engineering skills acquisition in libraries of federal universities in North Central, Nigeria?

Section G: Online databases versus skills acquisition

S/NO	Statements	VH	H	L	VL
1	My modelling skills has improved through the provision of online databases				
2	My ICT skills has improved through the provision of online databases				
3	I have acquired communication skills through the provision of online databases				
4	The online databases services provided by my library facilitates my technological skills				
5	My technical skills has improved through the provision of online databases				
6	My level of driving towards enterprise has improved through the provision of online databases				
7	Others (please specify)				

Key: VH: Very high H: High L: Low VL: Very low

Research question 7: What are the factors militating against skills acquisition of undergraduate students of Engineering in libraries of federal universities in North Central, Nigeria?

Section H: Factors militating against skills acquisition of undergraduate students of Engineering in libraries

s/n	Statements	SA	A	D	SD
1	Inadequate awareness of the services provided by the library				
2	Inadequate current information resources in the library				
3	Inadequate technical skills to navigate the subscribed databases in the library				
4	Inadequate information dissemination channel by the library				
5	Attitude of library the staff				
6	Inadequate Internet facilities to access the online databases in the library				
7	Inadequate power supply in the library				
8	Shortage of creative work space in the library				
9	Unconducive learning environment in the library				
10	Others (please specify)				

Key: SA: strongly agreed A: agreed D: disagreed SD: strongly disagreed

Reliability

Notes		
Output Created		27-JAN-2021 13:03:58
Comments		
Input	Data	C:\Users\USER PC\Desktop\sam\sam\JULIET RELIABILITY.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	30
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax	RELIABILITY /VARIABLES=ProQuest JStore ScienceDirect WebScienceIEEEexploredigitalli braryProjectMuse Emerald EbscoHost Medline /SCALE('online database') ALL /MODEL=ALPHA.	
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.05

[DataSet1] C:\Users\USER PC\Desktop\sam\sam\JULIET RELIABILITY.sav

Scale: online database

Case Processing Summary			
		N	%
Cases	Valid	30	93.8
	Excluded ^a	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.750	9

RELIABILITY

/VARIABLES=a b c d e f g h i

/SCALE('online database') ALL

/MODEL=ALPHA.

Scale: INFORMATION DISSEMINATION

Case Processing Summary			
		N	%
Cases	Valid	30	93.8
	Excluded ^a	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.798	9

Scale: CURRENT AWARENESS SERVICE (CAS)

Case Processing Summary			
		N	%
Cases	Valid	30	93.8
	Excluded ^a	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.727	13

Scale: ONLINE DATABASES2

Case Processing Summary			
		N	%
Cases	Valid	30	93.8
	Excluded ^a	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.746	10

Scale: relationship between information dissemination and skills acquisition in libraries

Case Processing Summary			
		N	%
Cases	Valid	30	93.8
	Excluded ^a	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.713	10

Scale: Current awareness services versus skills acquisition

Case Processing Summary			
		N	%
Cases	Valid	30	85.71
	Excluded ^a	5	14.3
	Total	35	100.0

a. List wise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.728	7

Scale: online database versus skills acquisition

Case Processing Summary			
		N	%
Cases	Valid	30	85.7
	Excluded ^a	5	14.3
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.800	6

Scale: factors militating skills acquisition of Undergraduate students

Case Processing Summary			
		N	%
Cases	Valid	30	85.7
	Excluded ^a	5	14.3
	Total	35	100.0

a. List wise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.826	9

The overall Cronbach Alpha value is 0.761, meaning the research instrument is strong and reliable.

Mean of all the Cronbach Alpha

$$\text{Average: } \frac{0.826 + 0.800 + 0.728 + 0.713 + 0.746 + 0.727 + 0.798 + 0.750}{8} = 0.761$$