



UNIVERSITY OF GHANA

DEPARTMENT OF INFORMATION STUDIES

THE USE OF ELECTRONIC RESOURCES BY RESEARCH STAFF OF CSIR-SAVANNA AGRICULTURAL RESEARCH INSTITUTE (SARI) AND CSIR-CROPS RESEARCH INSTITUTE (CRI): A COMPARATIVE STUDY.

BY

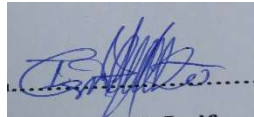
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**A THESIS SUBMITTED TO THE DEPARTMENT OF INFORMATION STUDIES,
UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY (MPHIL)
IN INFORMATION STUDIES DEGREE**

DECEMBER, 2021

DECLARATION

I Issah Issifu, hereby declare that this work is from my research and that references made to other peoples' works have been duly acknowledged, and that it had neither in part nor whole submitted elsewhere for the award of another degree.

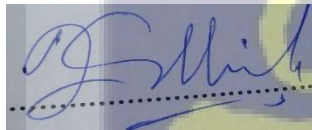


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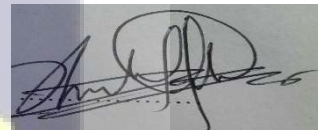
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Date: 01/08/2022

INTEGRI PROCEDAMUS

DEDICATION

To my father: Dramani Issah and mother Issah Memunatu, my wife Azara Yahaya, children: Issifu, K. Mufida, Issifu Y. Rashida, and Issifu Arafat, and hundreds of family members who often remain as invisible change agents in my life.



ACKNOWLEDGEMENTS

My special gratitude goes to Prof. Edwin Ellis Badu and Dr. Ebenezer Ankrah my principal and co-supervisor respectively for their fatherly love, patience, and guidance from the proposal stage through to the end of this research. Thank you very much.

I would also like to acknowledge the support of all lecturers in the information department for their constructive criticism through the proposal presentations to the end of this research work. Ayekoo.

My sincere thanks also go to Mrs. Lawrence D. Acheampong of CSIR-Crops Research Institute who personally collected the data in CSIR-CRI for the researcher.

I would also like to thank the Director, CSIR-SARI for granting me study leave and all staff of CSIR-SARI for the encouragement I received. Mpuhya.

I would also like to express my profound gratitude to my parents, my wife (Yahaya Azara), and all our children for their patience and continuous support throughout this project work. This work would not have been possible without them. Thank you.

To crown it all, I thank the Almighty ALLAH for HIS grace and favour over my life.



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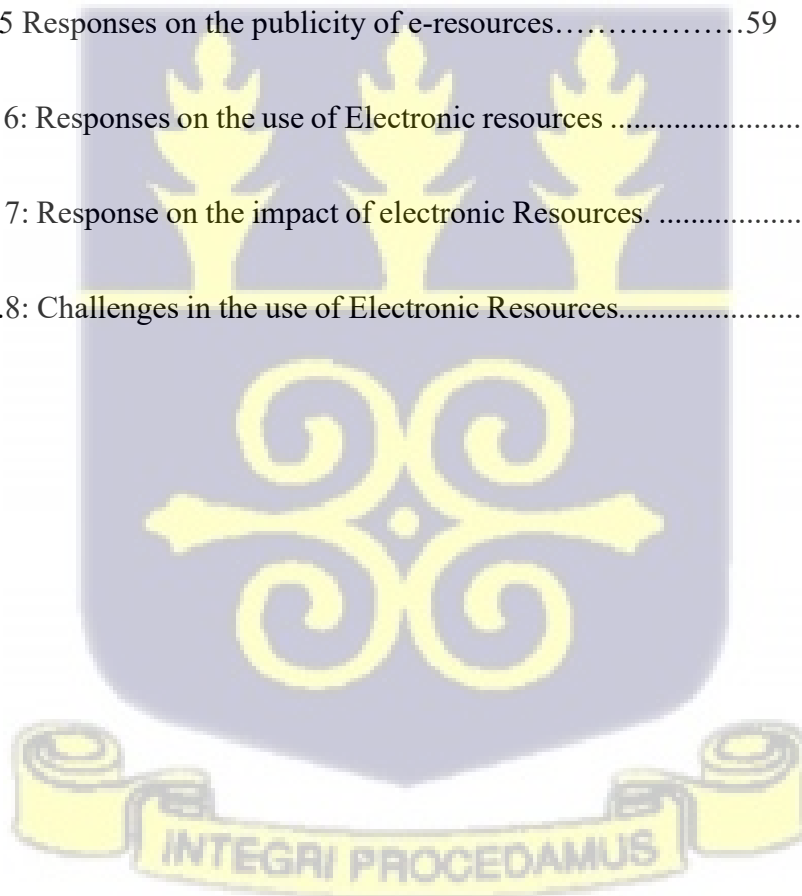
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LIST OF ACRONYMS AND ABBREVIATIONS

- AACR2* - Anglo-American Cataloging Rules, 2nd edition, revised
- AGORA - Access to Global Online Research in Agriculture
- ATUT - Attitude Towards Using Technology
- CD-ROM - Compact Disc Read-Only Memory
- CSIR - Council for Scientific and Industrial Research
- CTA - Technical Centre for Agricultural and Rural Cooperation (CTA)
- CARLIGH - The Consortium of Academic and Research Libraries in Ghana
- COVID-19 - Corona Virus Disease 2019
- E-RESOURCES - Electronic Resources
- FAO - Food and Agriculture organisation
- CRI - Crop Research Institute
- TEEAL - The Essential Electronic Agriculture Library
- ICT - Information Communication Technology
- INASP - International Network for the Availability of Scientific Publications
- JSTOR - Joint System to Order Resources
- NAES - Nyankpala Agricultural Experimental Station
- OARE - Online Access to Research in the Environment,
- PEOU - Perceived Ease of Use

PU - Perceived Usefulness

SARI - Savanna Agricultural Research Institute

SPSS - Statistical Packet of Social Science

TAM - Technology Acceptance Model

UDS - University for Development Studies



ABSTRACT”

The study investigated the use of electronic resources by the research staff of CSIR-Savanna Agricultural Research Institute (SARI) and CSIR-Crops Research Institute (CRI). The research sought to find out research staff awareness of electronic resources, usefulness of e-resources to research works, and challenges" associated with the use of these resources.

This study used the survey methodology. A census of the population of 240 research staff was involved in this survey. The findings indicate that a significant number of research staff in both institutes are aware of electronic resources. Majority of the respondents also indicated that they use e-resources daily. Although they use resources daily, they do not derive maximum satisfaction due to challenges such as poor internet connectivity, power outages, and struggle with information overload.

The use of electronic resources has a positive impact on the research staff of CSIR as the findings indicate; they can obtain relevant information, and know what has been published in their field of work. They agreed that e-resources are useful to their research work.

To ensure its maximum utilization, CSIR must invest in internet facilities to improve the speed at which literature is downloaded using e-resources. Efforts must also be made to ensure a constant supply of power to CSIR institutes.



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Technology has permeated all areas of human life and the use of information technology (IT) in our work processes and methods has come to stay. Libraries use IT for improved services and satisfying various user needs. Libraries have transformed into digital and virtual libraries where books, journals, and magazines have changed into e-books, e-journals, and e-zines. This has increased the worldwide dissemination of information. These utilities are known as Electronic Resources (E-Resources).

Reitz (2014), asserted that “Electronic Resources refer to data and/or computer program(s) encoded for reading and manipulation by a computer, by the use of a peripheral device directly linked to the computer, such as a CD-ROM drive, or remotely via a network, such as the Internet (*AACR2*). This category includes software applications, electronic texts, bibliographic databases, institutional repositories, Web sites, e-books, collections of e-journals, etc”. Some Electronic resources that are not openly accessible free of charge usually involve licensing, and verifications and others are open resources.

In Saharan Africa, the lack of current journals is a leading constraint on research. Electronic resources form an important part of library collection used to assist researchers to obtain information for their research works. The librarian must keep up with technological advancements and handle users' demand for e-information (Madondo et al., 2017).

Researchers should make conscious efforts to seek literature search through electronic information from the library and other sources. This will enable them to be abreast with current information on their field of work or research.

In Ghana, the Consortium of Academic and Research Libraries in Ghana (CARLIGH) was established in 2004. One of the major reasons for CARLIGH's establishment and continued existence is helping institutes in Ghana to gain access to several varieties of scientific, academic, and research knowledge that are found in electronic databases. CARLIGH offers training on electronic resources to libraries and librarians in the country. It does this over several training courses, which are organized both as interactive face-to-face sessions and currently via online courses.

Research staff access electronic resources within in their offices or the SARI-Library/CRI-library, this is made possible through the institutes' connectivity to the internet and subscription to many of these electronic resources and databases. Some of these electronic resources and databases are available in various forms such as e-books, online journals, and e-data archives, Access to Global Online Research in Agriculture (AGORA), OARE-Online Access to Research in the Environment, Joint System to Order Resources (JSTOR), The Essential Electronic Agriculture Library (TEEAL) and Ebscohost, CD-CORMS, Compendium among others.

Isah & Bwalya (2014), submitted that the emergence of electronic resources has cut the barrier to valuable information resources which until now were difficult to access especially by scholars in the developing nations of the world. Electronic resources are invaluable research tools that complement print-based resources in any traditional library;

they provide access to information that might be restricted to the user because of geographical location or finances (Sabouri, et al 2010).

Manda (2008), examined the extent of access and use of electronic resources by researchers by ten academic staff in Tanzania. The findings of the study revealed that the majority of the respondents were using electronic resources in their research.

Madhusuudhn (2010) examined the use of electronic resources by research scholars of Kuruksetra University in India. It was found that electronic resources have become a major part of the information needs of research scholars at Kurukshetra University.

According to (Bamigboye et al., 2018) electronic resources are invaluable tools for research interests and this has led to a breakthrough in research at Nigerian University.

Mentioning the advantages of electronic resources, Dadzie (2005) writes that electronic resources are vital to research tools that supplement print-based resources in a traditional library environment. Their merits, according to her include; access to information that might be restricted to the user due to geographical location or finances, access to more current information, and provision of extensive links to additional resources.

Naik (2009), states that the potentiality of the e-resources is enormous, they do not occupy physical space, eliminate time, space, and cost limits, are easy to archiving of the content and organized subjectively, and are accessible 24 hours a day, 7 days a week, among others.

The advantages of electronic resources have prompted many institutions including research libraries to invest in electronic resources to meet the information needs of their clientele.

Inspire of these vast merits of e-resources, several factors or difficulties still serve as impediments to the use of these e-resources by library clientele. These include irregular power supply, poor network connectivity, inadequate funding, lack of expertise, lack of technological infrastructure to support the services, as well as poor IT skills, etc.

1.1.1 Profile of CSIR, SARI, and CRI

The CSIR was founded in 1958 as the National Research Council, and has changed over the course of six decades to its contemporary state, comprising thirteen (13) research institutes and collectively over sixty (60) field stations, research centers, and establishments across the length and breadth of Ghana. The corporate head office is located in Accra, off Agostino Neto Road, airport residential area and the thirteen research institutes, and establishments are located across the country.

1.1.2 Savannah Agricultural Research Institute (SARI)

The Savanna Agricultural Research Institute (SARI) is one of the thirteen (13) research institutes of the Council for Scientific and Industrial Research Institute (CSIR). Originally known as the Nyankpala Agricultural Experimental Station (NAES). It was operated as an outpost of the Crop Research Institute (CRI), Kumasi. It was renamed Savanna Agricultural Research Institute (SARI) in 1994 and was upgraded to a full-fledged research institute. SARI is located 16 kilometers west of Tamale in the Tolon District of the Northern Region of Ghana.

1.1.3 Crops Research Institute (CRI)

Council for Scientific and Industrial Research (CSIR)-Crops Research Institute (CRI) is a public research institute established in 1964 and transformed into its current form by CSIR Act 521 in 1996. It is the largest of the 13 Institutes under the Council mandated to develop and transfer agricultural innovations and technologies relating to food and industrial crops in Ghana. With its headquarters in Kumasi.

1.2 Statement of the Problem

In several libraries and research institutes over the world, e-resources have become an important resource for research and learning. According to Bihari Sethi, and Panda (2012). E-resources in collaboration with the Internet have become a sign of the modern age being an invaluable tool for teaching, learning, and research. The library and information landscape have transformed with the onset of the digital era and today traditional libraries have changed their roles to serve as 'Knowledge Centres' with priority on value-added electronic information services. In the advance countries, the impact of e-resources as a primary source of information for research and learning in academia is overwhelming (Hiller, 2002).

Sami1 and Uppal (2016), asserted that E resources are introduced in the libraries to meet the information requirements of the users. The user uses these e-resources offered by the libraries or information centers to fulfill their information requirements. But, they use only those e resources to a sufficient and to a full extent which meet with their expectations. If these resources provide the required information at a fast rate, then positive attitude develops towards these e resources.

The situation in Africa is different as researchers find it difficult to access electronic information, even though much work has been done to make e-resources accessible.

A study by Taphros Madondo (2016) acknowledges that the use of electronic resources was low compared to the investment made to access these electronic resources. More efforts have been done to breach this gap.

CSIR in general have put in more effort to enable research staff to use e-resources by installing internet infrastructure and subscribing to various electronic resources and databases such as Access to Global Online Research in Agriculture (AGORA), OARE-Online Access to Research in the Environment, Joint System to Order Resources (JSTOR), The Essential Electronic Agriculture Library (TEEAL) and Ebscohost, CD-CORMS, Compendium and others. Moreover, some of these electronic resources can be accessed through CARLIGH by the researcher's staff. Despite these initiatives, a preliminary investigation revealed that a major constraint to e-resources access and use has been periodic technical glitches resulting in slow Internet speed, which tends to limit access to scholarly literature over the Internet.

Besides, a review of literature at the global and local levels on resource utilization, it is obvious to conclude that despite the treasure of literature available in the realm of e-resources usage, there is still a deficiency of relevant and appropriate literature pertaining to the use of e-resources employed by research staff in CSIR. This research seeks to investigate the use of electronic resources by comparing two institutes of CSIR (i.e. CSIR-SARI and CSIR-CRI). This is the first of its kind which compares the use of e-resources by research staff of CSIR-SARI and CSIR-CRI. Hence, it was a unique effort and determination to research into e-resource use in CSIR-SARI and CSIR-CRI. The study

compared challenges impeding the effective and efficient utilization of these e-resources in CSIR-SARI and CSIR-CRI.

It provided an in-depth analysis on the topic. As such, it should pave the way for a further study on e-resources use at CSIR Institutes as well as other similar Research institutes at Africa and global level.

1.3 Purpose of the Study

The purpose of this study was to examine the use of electronic resources by the Research staff of CSIR-SARI and CSIR-CRI for their research activities.

1.4 Specific Objectives of the Study

- 1 The following are the specific objectives of the study.
2. To compare the types of e-resources used by the research staff of CSIR-SARI and the research staff CSIR-CRI
3. To examine the awareness of e-resources by the research staff of CSIR-SARI and CSIR-CRI
4. To assess the use and ease of use of electronic resources by the research staff of CSIR-SARI and CSIR-CRI
5. To assess the frequency of use of Electronic Resources by Research staff.
6. To examine the usefulness of the use of electronic resources by the research staff of CSIR-SARI and CSIR-CRI
7. Recommendations made based on the findings

1.5 Scope and Limitations

The research was open to only the research staff of CSIR-SARI and that of CSIR-CRI. Moreover, the use of e-resources is a broad area of study. This research limited itself to the following thematic areas: awareness, use, ease of use, frequency of use, satisfaction, and coverage of e-resources

1.6 Theoretical Framework

Theoretical frameworks guide the paths of research and offer the foundation for establishing its credibility. It theoretically explains the path of research and grounds it firmly in theoretical constructs. The overall aim of the frameworks is to make research findings more meaningful, acceptable to the theoretical constructs in the research field, and ensure generalizability. It assists in stimulating research while ensuring the extension of knowledge by providing both direction and impetus to the research inquiry.

The current study was guided by the model which was propounded by Fred Davis in 1989. The Technology Acceptance Model (TAM). This model explains factors that influence users' decisions to use ICTs and for that matter electronic resources. The model proposed several factors that are crucial in determining ICT use. Some of these factors were perceived usefulness (PU) and perceived ease of use (PEOU). These factors interact with each other to give an actual ICT by individuals.

TAM was used as the foundation upon which this research was being investigated. The level of awareness and use of e-resources amongst research staff CSIR-SARI. The model specifically helped to determine research staff awareness of the availability of e-resources,

frequency of use of e-resources by research staff, and their capabilities the access information through the use of e-resources. The searchers consider this model appropriate due to the internal and external variables that will influence e-resource use at CSIR-SARI. Internal variables such as perceived usefulness of e-resources to research staff and the attitude of research staff towards e-resource use. The external variable could be a glitch in internet connectivity and the availability of ICT infrastructure or technologies).

The Technology Acceptance Model was relevant to investigate the level of use of e-resources for research activities among the research staff of CSIR and the foundation upon which this research was conducted. The model specifically helped to determine research staffs' awareness levels, how they accessed and used e-resources, the purposes of using e-resources, skill, and capability to use e-resources, and the frequency of their use of e-resources. Thus, the variables relevant to the study included usefulness (research staff use and benefits of e-resources), constraints to use (challenges research faced in using e-resources), attitude towards use (research staffs' attitude), and external variables (e.g. ICT skills required to use e-resources and availability of infrastructure or technologies).



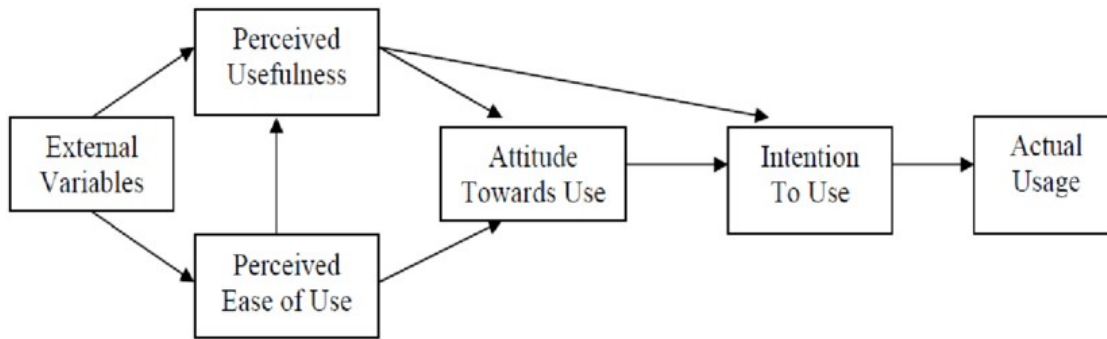


Figure 1. Technology Acceptance Model

Source: Davis et al. (1989)

1.7 Significance of the Study

The Research report will be of significance to research libraries, research staff of CSIR, and researchers in general as they should be concerned about which types of e-resources to acquire or subscript.

The study also serves as a policy document for the government, state agencies, and policymakers, as it revealed poor internet connectivity and power outages as the leading constraints hindering the effective and efficient use of e-resources by researcher staff.

The current research also contributed to the bulk of knowledge in the field of electronic resource use by research staff in Ghana, Africa, and the world at large and has the potential or ability to serve as reference material to anyone who would be conducting research in the area of use, awareness, and usefulness of e-resources, especially in CSIR, Ghana, and Africa as a whole.

Besides, the study revealed challenges research staff faced in their bid to access information using e-resources and proffered solutions to these challenges.

To crown it all, the research would assist various stakeholders to make the necessary decisions concerning the use of electronic resources.

1.8 Ethical Considerations

Ethical considerations are an essential part of every research and attention to ethical issues in research is increasingly recognized as essential (Christians, 2005; Denzin & Lincoln, 2005; Fleming & Zegwaard, 2018). Because of this, the researcher obeyed the following ethical guidelines before, during, and after conducting research work.

1. Participants were assured of strict confidentiality and anonymity of data provided for the study. As a result, participants were not in any way required to indicate their identity on the completed questionnaires.
2. The protection of participants' privacy was observed.
3. All sources of literature consulted were cited and duly acknowledged

1.9 Description of Chapters

The research work is made up of six (6) chapters:

chapter one (1) comprised of an introduction as the major heading and the following sub-heading: Background of the study, statement of the problem, purpose, and objectives of the study, theoretical framework, significance of the study and definitions, scope and limitations of the study, ethical consideration and description of chapters. **Chapter two (2)**, was dedicated to a literature review. **Chapter three (3)**, deal with methodology with the following subsections; research design, selection of Cases, selection of subjects,

population, instrumentation, and data analysis. **Chapter four (4)**, Data analysis and presentation of findings **Chapter five (5)** discussion of findings, **Chapter six (6)**, a summary of findings, conclusion, and recommendations.



CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Okoli & Schabram (2010), asserted that literature reviews are done to provide a theoretical background for subsequent research, or to answer practical questions by understanding what previous research has to say on the matter. He states further that, the theoretical foundation assist to bring the research questions into focus.

The chapter reviewed related literature which is relevant to this research work. The literature review intends to provide sufficient background information on the research being carried out, especially on electronic resources.

The researcher reviewed literature pertaining s to this research in the following categories.

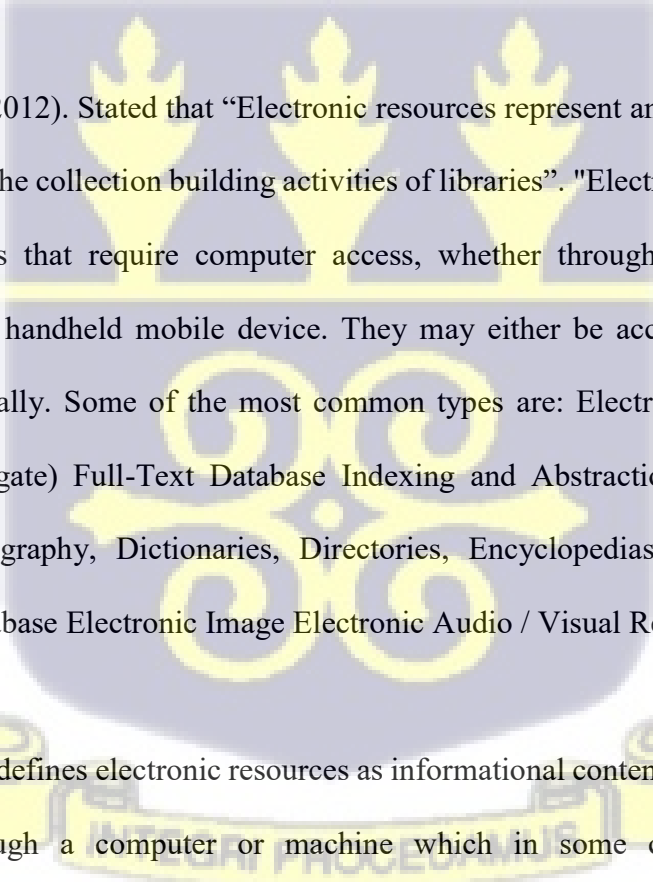
1. the concept of electronic resources,
2. The usefulness of Electronic Resources
3. Awareness of Electronic Resources.
4. Reasons for Use of Electronic Resources.
5. The use of e-resources in research institutions
6. Use of resources in CSIR
7. The use of e-resources in SARI and CRI
8. The contribution of electronic resources to research output.
9. Challenges of using electronic resources

2.2 The concept of E-resources

According to Velmurugan (2019), an electronic resource is defined as a resource that entails computer access or any electronic devices that delivers a collection of data, be it text referring to full-text bases, electronic journals, image collections, other multimedia products and numerical, graphical, or time-based, as a commercially available title that has been published with the purpose to being marketed. These may be delivered on CD ROM, on tape, via the internet, and so on. Over the past few years, several techniques and related principles have been developed which allow documents to be created and distributed in electric form. Therefore, to address the current situation, libraries are shifting inventory development to new media, or electronic resources, to better meet user demands. The e-resources on magnetic and optical media have a vast impact on the collections of university libraries. These are more useful due to inherent capabilities for manipulation and searching, providing information access is cheaper to acquiring information resources, savings in storage and maintenance, etc. and sometimes the electronic form is the only alternative.

Electronic Resource is defined as a source that needs computer access or any electronic item for consumption that distributes a compilation of information, be it manuscript referring to complete book bases, electronic periodical, depiction, other multimedia products and arithmetical, graphical or time-based, as a commercially obtainable label that has been published with an aim to being marketed. The data may store on CD ROM, on tape, via the internet, and so on. The entry of the modern library changed the entire library system, it invented many new techniques for the storage of data which created the documents in an electronic form. Thus the librarians change the present situation into

innovative techniques, namely electronic resources, It is a collection of data, files, journals, thesis etc in an electronic form, all the data may be digitalized, and the user can use it through a computer, smartphone via internet, through these e-resources the user can get numerous resources depending upon their needs, it will make them satisfied. The e-resources on magnetic and optical media have a vast impact on the collections of University libraries. These are more useful due to inherent capabilities for manipulation and searching, providing information access is cheaper than acquiring information resources, savings in storage and maintenance etc. and sometimes the electronic form is the only alternative (J.Kavithanjali, 2019)



Sharon et al. (2012). Stated that “Electronic resources represent an increasingly important component of the collection building activities of libraries”. "Electronic resources" refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the Internet or locally. Some of the most common types are: Electronic Journal Electronic Books (Aggregate) Full-Text Database Indexing and Abstraction Database Reference Database (Biography, Dictionaries, Directories, Encyclopedias, etc.) Numerical and Statistical Database Electronic Image Electronic Audio / Visual Resources

Anyim (2018) defines electronic resources as informational content in a format that can be accessed through a computer or machine which in some cases requires internet connections; this includes CD-ROMs, electronic books (e-books), electronic journals (e-

journal), electronic indexes, digital reference materials, online databases, and other e-collection

An electronic resource is defined as a resource that requires computer access or any electronic product that delivers a collection of data, be it text referring to full-text bases, electronic journals, image collections, other multimedia products, and numerical, graphical or time-based, as a commercially available title that has been published with an aim to being marketed. These may be delivered on CD ROM, on tape, via the internet and so on. According to AACR2, 2005 Update, an electronic resource is: "Material (data and/or program(s)) encoded for manipulation by a computerized device. This material may require the use of a peripheral directly connected to a computerized device (e.g., CD-ROM drive) or a connection to a computer network (e.g., the Internet)." This definition does not include electronic resources that do not require the use of a computer, for example, music compact discs and video discs. According to Library and Information Technology Glossary "Term used to describe all of the information products that a library provides through a computer network.

2.3 Usefulness of Electronic Resources

Research conducted Lucky (2012) on the Use of Electronic Resources and its Impact: A Study of Dhaka University Library Users reveals that 26.0% of users rated the benefits of electronic resources as excellent, 37.0% of users rated the use of electronic resources as average, 10.0% rated it as poor, and 27.0% rated it as good.

Kavithanjal (2019) concluded in their research title "E-Resources: Their Importance, Types, Issues, and Challenges: An Analysis" that electronic resources are very familiar

among the various fields of people, and it is now hard to envisage a world without e-resources. The stipulation and use of e-resources is an element of the complete system, for both the students, institutions, and information professionals. The e-resources assist to deliver the sources to their user very fast, so the user time was saved. Nowadays e-resources have reduced the usage of paper material. These e-resources are convenient to use, reachable at a reasonable cost, and can be accessed from anywhere and by many users concurrently, these databases are most advantageous to utilize to put into the academic excellence and achievement of its user community.

Dayakar (2018), concluded that these e-resources have also come with many advantages giving solutions to many professional problems like a solution to a space problem, providing remote access, convenience in use, increased readership with improved services, leading to more opportunities for productive research output and academic excellence within a short time. Recent studies have also proved that in researchers' opinion, improved access to e-resources has positively influenced their research activities by helping them to keep up-to-date and by saving time.

Sebastian & Muthumari (2020), The purpose of their study was to determine the impact of resources. The respondents under study 154(43.8%) suggested that the usage of e-resources has improved their learning/professional competence, 132(37.50%) indicated that dependency on the e-resources had increased due to the continuous usage and 66(18.80%) was happy with the e-resources since it has been expedited their research process.

2.4 Awareness of Electronic Resources.

Several relevant studies have been carried out on user awareness of e-resources. Adam Burhansab et al. (2020) conducted research titled; investigating Awareness and usage of Electronic Resources by the Library Users of Selected Colleges of Solapur University. The study found that awareness and e-resource use were very common among library users. Library users rely heavily on resources to find, search, and communicate research, making resources an integral part of finding reliable, timely, and relevant information.

Ram & Amit (2012) investigated the use of electronic resources at I.I.T., Kharagpur, India. This study explores users' exposure to electronic resources and alert services offered by the library for awareness and helpfulness. Based on the questionnaire method, the result found that most of the respondents have stated that they are reasonably aware of the e-resources available in the library concerned with their subject. They most preferably use e-journals than print journals.

Sohail & Alvi (2014) conducted a web resources study at Aligarh Muslim University, Aligarh, India. Data were obtained by the questionnaire method. The findings show that 100 % of the students were aware of web resources and mostly used them. Most medical students use web resources to develop knowledge and collect information. Students consider web resources to be accurate. It was reported that the medical students about 63.04 percent take assistance from friends for accessing electronic resources.

Asom, Suleiman, and kudu (2018) carried out a research titled, impact of awareness and accessibility of electronic information resources in university libraries on research by postgraduate students of federal university of Agriculture Makurdi and Federal University

Of Technology Minna – Nigeria. One of the objectives was to Ascertain the level of awareness of the postgraduate students on the accessible electronic information resources. The findings of the study indicate that the PG students of the universities under study were highly aware of all the nine (9) digital information resources listed in the table. These resources included e-theses, e-journals, CD-ROMs, e-newspapers, e-magazines, multimedia products, e-books, online databases, and OPAC. The overall mean showed that e-thesis ranked highest, while OPAC ranked lowest in terms of the level of awareness of the PG students. Furthermore, analysis of the individual universities under study revealed that in FUAM, e-magazines ranked highest, while OPAC ranked lowest, while in FUTM, e-thesis is ranked highest while OPAC still ranked lowest. The findings agree with those of Pauline (2013) who discovered that majority of the students in Redeemers' University, Ede was aware of the available electronic resources in their library such as CD ROMs, e-books, and online databases, e-journals among others. Similarly, Sunil (2011), Baljinder and Rama (2009) in their separate works observed that users are aware of the availability of digital resources in their libraries particularly, electronic journals.

Joel (2020) also indicated in their study titled “Awareness and Purpose of Electronic Information Resources among Postgraduate Students of Library and Information Science in Borno State” noted that the majority of PG students are aware of electronic information resources. The results also showed that the majority of PG students agreed with the purpose of using electronic information resources at universities in Bauchi State.

Eiriemiokhale, (2020) in his extensive research on the Frequency of Use and Awareness of Electronic Databases by University Lecturers in South-west, Nigeria suggested. To increase the use of electronic databases by teachers, academic libraries need to expand their

library orientation programs, constantly distribute leaflets, and send notifications by email and SMS. Nigerian academic libraries need to find ways to encourage faculty to use the electronic databases available in the library. They need to carry out continuous awareness campaigns. Instructor training on database handling should collaborate with university management to improve campus internet connectivity. This is because his research found that university libraries in southwestern Nigeria produced a low level of awareness of e-resources.

Subha and Natarajan (2019) explored the awareness, availability and usability of e-resources by the faculty members of Arts & Science Colleges in Erode District, Tamil Nadu(India). The survey method and questionnaire as a

data collection tool were used in the study. The results revealed that almost all the users were aware of the e-resources and access to all kinds of e-resources.

The majority of respondents (52), who make up 65% of the sample, knew about the library's electronic resources. However, 28 respondents, accounting for 35%, said they were unaware of the library's electronic resources. (Franklina & Florence, 2017)

The level of awareness and usage of electronic information resources available were measured at two medical colleges at Al-Jouf University. According to the results, the undergraduate students use e-books more than the other forms; the students who are dissatisfied with the electronic databases prefer to use general internet resources. It was recommended to provide medical students with needed information literacy skills to improve the level of awareness and usability of electronic information resources (Ahmed & Al-Reyaaee, 2017). In the same way, another research was conducted to investigate the

usage of electronic information resources by the academic staff of Umm Al-Qura University. The findings showed that the academic staffs depend on these resources in the research and teaching process as well, the challenging issues were mainly related to the internet speed in downloading the resources

and the insufficient number of computers, the study recommended providing training programs to maximize the effective use of the e-resources (Alzahrani, 2016).

Sivakami & Rajendran (2019), sought to determine and find the present status of awareness, accessibility, and use of electronic resources among science research scholars of Jiwaji University Gwalior, like CDROM databases, online databases, online journals, OPAC, etc. The research was also conducted to identify the challenges, benefits, and progress gained by research scholars while accessing the e-resources. It was found that 'Shodhganga' was the most used (95%) by research scientists, followed by DOAJ. It was also shown that scholars (45.5%) used the library's website to research the resources and databases available at the institute, followed by a search on the Internet. The detailed results of this study were discussed and recommendations were made to improve and enhance e-resource usage.

Navin K. & Kapil K. (2018) carried out a research on Awareness and Usage of Electronic Resources among LIS Scholars of Jiwaji University, Gwalior : A Survey. Their main objective was to find out the awareness of usage of e-resources among research scholars at JU, Gwalior in its field. The data collected shows that all research scholars' respondents are using e-resources provided by university and college libraries for the research work. As the e-resources are providing information regarding current research to scholars without any delay on their desktop, thus it reduces the period of access to information for them.

The study has unearthed the fact that 92.18 % of the respondents preferred to use e-resources compared to print documents, so also an overwhelming majority of the Life Scientists use e-resources primarily to keep themselves up-to-date on the subject (71.87 %) and to complete assignments and seminar presentations (64.06 %). (Satpathy and Rout, 2013)

2.5 Reasons for Use of Electronic Resources.

Santhi (2020), in his extensive review of literature the on Use of Electronic Resources in Indian Academic Institutions, asserted that electronic resources are easily accessible in remote areas. Ability to access articles at any time from your desktop computer; ease of browsing and searching, the possibility of downloading or printing the desired document or segment, the currency of information, the speed of access, and the ability to send articles to their colleagues instantly are the few advantages experienced by the users in the use of e-resources. Both faculty and researchers use the electronic resources and most readily adopt them since the e-resources are perceived as convenient, relevant, and time-saving to their natural workflow. He concluded that conventional print periodicals are being substituted by electronic journals with benefits for libraries and users obvious in many ways. Users can access, download and print out papers with ease. Therefore e-journals usage has improved. Further, there was a considerable surge in awareness among the users about the library's e-resources and e-services. The use of electronic journals improves the quality of research by providing enriched content on different subjects of study. Several studies have been conducted to measure the use and impact of electronic journals. Electronic information sources are becoming more and more important for the academic

community. Faculty as well as the researchers are a unique population and rely on recent and timely information. Electronic resources are now used more often than print resources. There is a great need to study the use of electronic resources and investigate the level of satisfaction among academics and researchers.

Waghmode et al. (2021) explored the Reasons and Use of E-resources by Graduate Students in Navi Mumbai, they found out that, E-resource is a precious tool that compliments the print resources. There are numerous benefits of e-resources viz; less expensive, access to updated information/ contents, additional links, saving traveling time, etc. Several online databases such as EBSCO, Science Direct, ACM, IEE etc., can be easily accessible from anywhere just using a single click of a button. The research paper explores some of the motives and uses of e-resources which can be useful for students while accessing the e-contents for various purposes. The study was based on pilot data collected from 246 graduate students studying in different colleges in Navi Mumbai. It was found from the study that students' gender and sources of getting e-resources are insignificant. Furthermore, it was shown that there was a significant relationship between age and the source of accessing e-resources. In today's situation of COVID-19, e-resources play a vigorous role in education as well as the entire system. There was no single field where we couldn't see the use of e-resources, so receiving essential knowledge about e-resources was today's need as it was found that for students it was useful for a variety of reasons mainly it is less expensive, it can be helpful in assignments and projects, ease of use, high speed, getting maximum information about any subject, for upgrading skills and it assists in motivating, reading and in the exploration of updated/ recent information.

Kavithanjali (2019), investigated the importance, types, issues, and challenges of e-resources. The study concludes that e-resources are easy to use, obtainable at a reasonable cost and can be accessed from anywhere and many users can use them concurrently. The databases are most advantageous to utilize and can be incorporated into the academic excellence and achievement of its user community.

Ranganadham (2017), carried out a study on the "Use of Electronic Resources of Sree Vidyanikethan Engineering College, A. Rangampeta, Tirupathi: A Survey." The study found that, 27.02% representing the majority of the respondents prefer e-resources to print sources because e-resources are easy to use and save their time.

2.6 Use of electronic resources in research institutions

Several research/studies have been carried out on the use of e-resources in research institutions across the globe. Mwantimwa, & Ndenje-Sichalwe (2017), conducted a survey to investigate the Utilisation of E-Resources to Support Teaching and Research in Higher Learning Institutions, Tanzania. They found out that, Awareness, access to and usage of e-resources among academic staff and researchers are on the increase. The e-resources are used to support teaching and research in the higher learning institutions under study. Demographic characteristics such as age and level of education of the academic staff and researcher are some of the predictors of the use of e-resources. Despite its importance in supporting education and research, most of the subscribed e-resources are rarely used. It seems academic staff and researchers frequently use open access resources than those subscribed.

Mahapatra (2017), argued that recent time has witnessed dramatic changes in social science education and research in India. In order to make education a qualitative one, the authorities have started to institute libraries on their premises. But no one knows how qualitative these libraries are? What are their collection, services, manpower, etc? In order to invigorate the use of libraries in the present day situation, it is essential to utilize the e-resources for furthering social science education and research. In order to build a good library suitable to the educational environment, it is essential to make a study on the use of e-resources among the social scientists working in Bhubaneswar to determine their needs. As a result, the

A qualified librarian can identify the right documents to be acquired, appropriate organization of documents to be undertaken and the right information services to be developed. The study showed a mixed trend in the use of e-resources among social scientists. A majority of social scientists prefer to use e-resources for teaching and research. The users have the highest preference for Internet browsing through which they search for useful information for social science research. Similarly, e-journals are also preferred as the most suitable form of electronic information. While statistical sources of information are also in electronic format, they prefer to use IndiaStat.com for their research work. Similarly, ECONLIT database is preferred as the most suitable for searching for information. A majority of the respondents are satisfied with Internet use and they want online information to be made essential for the furtherance of social science research.

E-resources are gaining importance among the lecturers and research scholars of speech and hearing institutes. The importance of e-resources comprising e-journals, e-books and e-theses is undisputed for learning and research, especially in the field of medical sciences.

Noticing this need, the Indian Council of Medical Research (ICMR) and Ragiv Gandhi University of Health Sciences (RAGUHS) have started extending access to full-text medical journals over the past many years. The trend of facilitating remote access to scholarly information is also considered by the medical institutions in order to make the information services available anytime and anywhere. Majority of the faculty and research scholars are dependent on e-resources to get the desired and relevant information. Infrastructure and training programs also need to be revised according to requirements. It was observed that the availability of resources on campus is almost sufficient in all existing subject areas but the infrastructure to use these resources is not adequate and can hinder the ability to meet the requirements of users (Ramamani, 2017).

According to Adegboro (2011), “Databases and electronic journals are used by professors, lecturers and researchers for both teaching and research, among many other uses”. Academics have indicated satisfaction with their use of electronic resources and have committed their interest to the continuous use of e-resources because their use leads to better research and enhances scholarly communication. E-resources will continue to enjoy wider acceptance among academics as the future unfolds and barriers to their use are reduced.

Shashikala & Srinivasaragavan. (2019), conducted a survey to investigate the Usage of E-Resources by the Faculty Members and PG Students of Kempegowda Institute of Medical Sciences Hospital and Research Centre (KIMS), Bangalore, Karnataka: A Study.

Structured questionnaires were designed and distributed to faculty and PG students (150) to know how effectively resources are being used for learning, education, and research. A

total of 135 questionnaires were answered, and the response rate was 82.66%. As a result of the survey, most faculty members and PG students preferred to use Google and Yahoo as search engines to search for information. At the same time they consulted Pub Med and Science Direct and Ovid publisher's journal databases to access E- resources.

Siwach and Malik (2019) conducted a study to examine the use of e-resources by science faculty and researchers in selected North Indian universities. Their results indicate that the databases mainly used to access information were Science Direct, Springer Link, Taylor and Francis, Nature, Web of Science, Wiley Blackwell, SciFinder Scholar, Annual Reviews and Oxford University Press. Moreover, their findings indicate that the databases least used by the faculty members were Royal Society of Chemistry, Cambridge University Press, American Chemical Society, American Physical Society, Math SciNet, American Institute of Physics, Institute of Physics Portland Press and Project Euclid. These databases were subscribed to by the surveyed universities because most of them cannot be accessed without subscriptions. These findings were similar to those reported by Siwach and Malik (2019) who found that Taylor and Francis, Science Direct, Springer Link and JECC were the popular and most used databases by academic staff and researchers. Moreover, e-resources such as ACM, AGORA, TEAL, EBSCOHOST, HINARI, IEEE, IET, Science Finder, JSTOR, EMERALD, Scopus, ProQuest, ERIC, McGraw Hill e-books, Pearson e-books, and e-brary were heavily used by researchers and academic staff of different universities (Egberongbe, 2011; Santhi and Gopalakrishnans; 2016). To investigate e-resource usage among scholars, Gupta (2017) observed that Springer Link was the most popular at Banasthali University. On the same note, most of the faculty members and

research scholars Academic Staff and Researchers use of Electronic Resources 57 effectively used Science Direct, and Springer Link as noted by Nanda (2017). Databases such as CMIT and Euromonitor were moderately known and used by researchers. Moghaddam and Tallawar (2008) noted that Elsevier electronic journals were most popular and used by a large proportion (63.9%) of surveyed academics and researchers. In all, results from prior studies suggest that both subscribed and open access resources are utilised by academics and researchers. However, it is not easy to draw a conclusion on the most popular and frequently used types of databases. This is attributed to the fact that the extent of database usage depends on its accessibility at respective universities. The literature further demonstrates that programmes offered by universities determine the kind of databases to subscribe to, access, and use. Whereas some databases cut across different disciplines, others are special for certain disciplines such as engineering, social sciences, sciences.

Qasim and Khan (2015) conducted a research on the Awareness and Use of E-journals by the Research Scientists of CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi, and Indian Institute of Chemical Biology (IICB), Kolkata, India: A Comparative Study. Their results show a total awareness, acceptance, and use of e-journals as recognized by the research scientists of both under study institutes (CSIR-IGIB and CSIR-IICB). The findings were limited in scope i.e. to the scientists of the two under study CSIR Institutes of India.

2.7 Use of resources in CSIR

E-resources are important to the library's collection nowadays as they meet the needs of various users. CSIR Research Institute continues to invest and expand its electronic

collection to satisfy the needs of research staff. Although not much research has been done on electronic resources use in CSIR Ghana, nevertheless, a number of literature are available. Acheampong et al. (2020) conducted a research on Investigating Awareness and usage of Electronic Resources by Research Scientists in Ghana with the objectives of measuring the extent of awareness and level of use of electronic resources; access, perceived reliance, and impact of the use of electronic resources on research work and productivity of research scientists and to identify challenges faced by researchers while using electronic resources. They found out that e-resources awareness and use are very common among research scientists. Scientists largely depend on e-resources to search, retrieve and communicate research making e-resources an essential part of them finding reliable, timely, and relevant information.

The study assessed the use of e-resources among agricultural research scientists in Ghana. Data was collated from 48 (70.6%) out of 68 scientists at the Food Research (FRI) and Animal Research (ARI) Institutes of the of the council for Scientific and Industrial Research (CRIS), Ghana. The results revealed a very high (97.9%) level of awareness and use of e-resources among the research scientist whose preferred places of retrieving information from e-resources were their offices and the library (60%). The scientists were most satisfied with the full-text databases (73.0%) and e-journal (81.3%) but reported problems of slow access speed (58.3%), high subscription fees and frequent power outages. There was no significant variation in access to and use of e-resources between the scientist from ARI and FRI ($P=0.05$). The study suggested that budgetary allocation for e-resources facilities in agricultural libraries should be improved since scientists are known to have preference for electronic (Obeng-Koranteng & Dzandu, 2013)

Additionally, a research carried out by Folitse et al. (2017) revealed that most scientists assimilated computer knowledge without undertaking formal training in the use of the Internet. Mostly they learned through self-development. The researchers used the Internet to access information, mostly for research work. The study, therefore, suggested that various research institutes should procure more bandwidth for their Internet connections to accommodate more computers and to improve the Internet speed.

2.8 The contribution of electronic resources to research output.

Bamigboye et al. (2018) conducted a study on Electronic Resources as a Panacea for Research Output of Academic Staff: A Case Study of Nigerian University. The findings of the study revealed that all respondents agreed that e-resources contributed to their research output, since they have been using e-resources their research output has increased tremendously.

Ho (2020), carried out a study and the aims were provides insight into how the sufficiency of e-resources were measured and the association between e-resource use and research output were identified.

A systematic approach was presented to assess electronic resources' impact and to investigate and demonstrate the Library's support of research output in local research and the scholarly environment.

She found out that, the change in university direction toward research was apparent in the data since Fall 2014. Since then, faculty publication output grew rapidly and was positively correlated with library resources use. Sessions and searches displayed a strong positive relationship with research output while the correlation with full-text downloads was

moderate. This was true for individual colleges as well as for the university as a whole, supporting the assumption that library utilization is highly correlated with the growth of research productivity.

"The electronic resources are of no doubt the preferred choice for getting up-to-date and current information. The access to e-resources would improve the research activities and research outputs, decrease the cost of information retrieval with efficient delivery of information economically to all users in addition to enhancing the computing, and communication networks which leads to strengthening the collaboration among academic researchers. At PNU, academic staffs depend on e-resources to improve their teaching, learning, and research outputs. The majority of academics are aware and satisfied with the e-resources services offered by the PNU"(Abdel-Gaber & Ali, 2020)

According to Ngeme & Adesina (2021), in their study on Accessibility and Usage of Electronic Information Resource on Research Output of Librarians in Ekiti, Ondo and Osun States (2010 – 2015). Revealed a contrary finding. They concluded that, in the recent knowledge-based society, the need for universal access and use of electronic information resources is imperative for librarians to redefine their stand in terms of research output. It is obvious from the finding of the study that most librarians in universities in Ekiti, Ondo, and Osun States have access to electronic information resources but they are not adequately using these resources in their research output. In addition to the findings of this study, quite a lot of electronic information resources were made available and frequently used in the three states. Despite this fact, the study documented some challenges

facing librarians in using these resources. As deduced in this study, the librarians have access to electronic information resources but use them for other purposes.

Manda & Nawe (2001), carried out a study on the impact of electronic information resource use on research output: experiences from Universities in Tanzania. Their objective was to determine whether the use of electronic information resources has positively influenced on the quality and quantity of local research output in the public universities in Tanzania. The findings of their research revealed that the use of electronic information resources and specifically online resources had a positive impact on various research activities and milestones such as research proposal submission, research proposal funding, research report writing, and journal article publishing. The results, therefore, provide empirical support for the hypotheses that the increased flow of information because of increased access to and use of electronic information resources is related to increased research output and enhancement of the quality of research. A survey carried out by Ahmed, Amjad and

Khan (2017) in assessing the relationship between E-Resources Usage and Research Productivity among University Scholars in Pakistan disclosed that the use of electronic resources has a significant correlation with research productivity in the context of Pakistan and thus H₁ is supported. It is evident from the findings of their study that e-resources usage has positively impacted respondents' research work. Their results showed that the perplexing attitude of scholars' towards the usage of e-resources is astonishing. Therefore, university library professionals should come up with several values and additional products/services in the library to promote and publicize the usage of these resources among the end users. The findings of H₂ showed that the authenticity and value of

electronic resources are also an important factor in promoting researchers' success. With such features of electronic resources, the patterns of e-resources usage have been changed from print to e-formats. No doubt, the usage of electronic resources has improved research quality.

2.10 Challenges of using electronic resources

Relevant literature reveals the challenges of using electronic resources to access information despite its usefulness to academia and researchers. By reviewing literature in this field, we identify some key challenges. Kwakye, & Asante (2016) investigated the challenges users face when accessing library electronic resources and identified unreliable power supply and snail speed of internet connectivity as a major challenge. This is similar to what Akporhonor & Akpojotor (2016), found in the context of Library and Information Science postgraduate students in Nigeria where access to electronic resources was characterized by poor internet connectivity coupled with epileptic power supply, high cost of access, and download delays. Ternenge and Kashimana (2019) research into the availability, accessibility, and use of electronic information in Nigeria exposed power outages, slow and poor internet connectivity, and lack of relevant resources as challenges obstructing students from use.

Okite-Amughoro, Bopape & Makgahlela (2015), explored the challenges of using electronic information resources (EIRs) for academic research by post-graduate students at Delta State University (DELSU), Abraka, Nigeria. The study used a structured questionnaire, distributed to 150 post-graduate students from the faculties of Sciences, Social Sciences, and Arts, that is, 50 post-graduate students per faculty and personal interviews were held with selected individuals within the institution to collect data. The

central focus of the study was the post-graduate students' access to EIRs; the current status of EIRs in their institution; how often they use these resources for academic research purposes; and above all, the challenges that they encounter when using EIRs. The findings showed that post-graduate students' optimal use of EIRs at DELSU is hampered by limited access to some EIRs due to limited space, low bandwidth, and erratic power supply.

Amina (2016), carried out a study on the "challenges confronting postgraduate library and information science students in the use of electronic resources in southern Nigeria". The study adopted a descriptive survey using a questionnaire to collect data. A total of three hundred and seventy-five respondents comprise all postgraduate master's students in library and information science in eight universities (federal and state) offering library and information science at the postgraduate level in Southern Nigeria was the population of the study. The study concludes that despite the comparativeness of electronic information resources in empowering the information and academic need of postgraduate library and information science students in Southern Nigeria certain impediments to the use of electronic resources were identified. Some of the impediments were; epileptic electricity supply, poor network, information overload, high cost of access, download delay, and difficulty in accessing some websites.

According to Okoli & Schabram (2010), literature reviews are performed to provide a theoretical background for further research or to answer practical questions by understanding what existing research has to say on the topic. He states further that, the theoretical background helps to bring the research questions into effect.

The literature review indicates that a lot of research has been done in this area. The intention of the literature review is to provide sufficient background information on the research being proposed, especially on electronic resources.

Electronic resources are invaluable to the library's collection today as they meet the needs of diverse users. Institutions of higher learning continue to invest funds to expand their electronic collection to satisfy the needs of their target population. However, electronic resources are underutilized even with these huge investments. The study revealed that several electronic resources such as OPAC, E-books, E-journals, electronic databases, and others are available in the University to be used by students to enhance their academic performance. It was also revealed that electronic resources are essential to graduate students of the University of Ghana Business School as it helps to retrieve information with ease, expand their knowledge base, and help in research/project work, among others. It was realized that students face some challenges when accessing electronic resources and these challenges include slow access speed, ".lack of" searching skills, difficulty in finding relevant information, limited subscribed databases, and overload of information on the internet (Horatia Obiokor Amoo, 2018).

According to Adegbore (2011), Databases and electronic journals are used by academics for both teaching and research, among many other uses. Academics have indicated satisfaction with their use of electronic resources and have committed their interest to the continuous use of e-resources because their use leads to better research and enhances scholarly communication. E-resources will continue to enjoy wider acceptance among academics as the future unfolds and barriers to their use are reduced.

Ansari & Zuberi (2010), concluded that Electronic resources are the best means of getting current and up-to-date information. Academics use these electronic resources, but due to networking problems and lack of training, they are not properly used. While a majority of academics are quite satisfied with electronic resources, they regard them as less reliable. They consider electronic resources produced by an authentic organization or website to be authentic and reliable. Electronic resources are mostly used for research and lecture preparation.

From the above literature review, it can be realized that the use of e-resources in libraries began with the development of the machine-readable cataloguing (MARC) format in the mid-1960s even before the World Wide Web (www) and its omnipresence was introduced. Academics are increasingly becoming aware of the presence of e-resources in universities, and e-resources are gradually becoming the best means of getting current and up-to-date information. As a result, there is an increasing preference for electronic resources to the detriment of the printed format. Electronic resources provide faster and more reliable information, and "computer literacy skills" is found to have a positive relationship with the "use of electronic resources".

SUMMARY

The purpose of the literature review in this chapter was to identify related works that are relevant to the present study. The chapter reviewed literature taking into account the theory of electronic resources, the usefulness of E-resources, Awareness of Electronic Resources,

reasons for Use of Electronic Resources, the use of e-resources in research institutions, use of resources in CSIR, the usage of e-resources in SARI and CRI, the contribution of electronic resources to research output and challenges of using electronic resources.

The literature review revealed that electronic resources have in no doubt contributed to the availability of information to students, faculty, and research scientists. Most research work done in this area place more emphasis on student and faculty use and awareness of electronic resources. Although research scientists are aware of and use electronic resources in their work not much work has been done to determine the level of e-resource use by research staff. However, there is an increasing preference for electronic resources by research staff, since, electronic resources provide faster and more reliable information to research scientists. Challenges to library staff in terms of provision of information to users. The conventional user education programmes aimed at equipping staff with the skills to work need to be refined and re-engineered with more emphasis on the requisite skills in information and communication technologies. Skills in areas such as management, evaluation of information resources, value additions processes, user information need identification and analysis, and information literacy was also part of the revelation. Again, information resources continue to grow in strategic importance to academic libraries, the personnel is compelled to acquire new skills and be able to apply them in new areas beyond the traditional boundaries.

As revealed in Acheampong et al. (2020), in their research on Investigating Awareness and usage of Electronic Resources by Research Scientists in Ghana with the objectives of specific objectives of measuring the extent of awareness and level of use of electronic

resources; assessing perceived reliance and impact of the use of electronic resources on research work and productivity of research scientists and to identify challenges faced by researchers while using electronic resources. They found out that e-resources awareness and use are very common among research scientists. Scientists largely depend on e-resources to search, retrieve and communicate research findings, making e-resources an essential part of their research work.



METHODOLOGY

3.1 Introduction

A method can be defined as the process and procedures which must be strictly followed to achieve the objectives of an organization. Research methodology according to Kothari (2004) is systematic procedures for solving a research problem. This chapter of the study was designated to discuss the methodology used to conduct the research. The focus of the chapter was on; research design, selection of cases, Selection of Subjects (description of the population, sample, and sampling), instrumentation, and data analysis.

3.2 Research Design

Research design is a plan that helps the researcher to get research participants (subjects) and to obtain information from them, with the purpose of reaching a conclusion about the research problem (Welman, Kruger, and Mitchell, 2005). Several research designs may be adopted when undertaking a research study, however, for the aim/purpose, objectives, and availability of resources, a survey research design was used. A survey is a methodical procedure for collating data from subjects for the purposes of constructing quantitative descriptors of the attributes of the larger population of which the subjects are members. Surveys are done to collect information that reveals the population's views, behaviors, opinions, and beliefs that cannot be observed directly. A survey methodology was employed for this study to collect data.

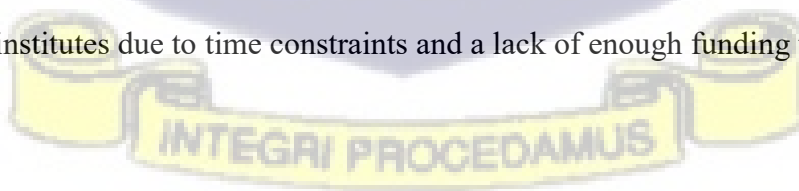
The survey design was selected based on the purpose of the research, the objectives, and the availability of resources.

Also, the survey research design was selected due to its advantages as compared to other types of research designs. The advantages are, that it can be conducted faster and cheaper, Surveys are more reliable and objective, they can be administered from remote locations by means of mail, e-mail, or telephone, primary data gathered through surveys are relatively easy to analyse among others.

3.3 Selection of cases:

CSIR-SARI and CSIR-CRI were selected as the study setting for this research. CSIR-SARI and CSIR-CRI are among the thirteen (13) research institutes under the CSIR with a lot of research activities carried out by research staff. The research staff of both institutes uses electronic resources to access information relevant to their research activities. CSIR-Savanna Agricultural Research Institute is situated 16 kilometers west of Tamale in the Tolon District., whilst CSIR-CRI is located in Fomesua in Kumasi.

CSIR-SARI and CSIR-CRI are selected because of the similar characteristics these research institutes share and whose research staff incorporates the use of e-resources for their research activities. The institutes' are also considered as the largest within the CSIR which also has various research staff which can give the researcher a representative view of electronic resources used by research staff. Moreover, the researcher selected the two research institutes due to time constraints and a lack of enough funding to cover the entire CSIR.



3.4 Selection of Subjects

A group of individuals or objects selected for specific research are the subjects of the study. In this segment, the Population, sampling technique, and size are discussed.

3.4.1 Population

The first phase in the sampling process is to openly define the target population (Taherdoost, 2016). The population is commonly related to the number of people living in a particular country.

The study population according to Connaway & Powell (2010) is the total number of cases that meet a predefined criterion or set of criteria. The population of a study has equally been defined by Neuman (2014) as the higher unit revealing identical features from which a sample can be obtained. The population is generally a large collection of people and things that is the focus of scientific questions. It is for the benefit of the population that research is done. It is also known as a well-defined collection of people or objects known to have similar properties. All individuals or objects within a certain population usually have a common, binding characteristic or trait.

The population of this research comprised the research staff of CSIR-SARI and that CSIR-CRI. The total population was 240 participants. The Table below gives the breakdown of the population in both institutes.



Table 3.1|: Research institutes and number of research staff

CSIR-SAVANNA RESEARCH INSTITUTE		AGRIC.	CSIR-CROP RESEARCH INSTITUTE	
DIVISION	NUMBER OF STAFF		DIVISION	NUMBER OF STAFF
Northern Region Farming System Research Group	25		Root and Tuber crops	16
			Cereals	19
Scientific Support Group	48		Legumes and oil seed	10
			Horticulture	9
Upper West Region Farming System Research Group	12		Resource, crop management, and socio-	28
			Economics	20
Upper East Region Farming System Research Group	9		Plant Health	15
			Scientific Support Services	
			Biotechnology/Seed Technology/post-harvest	29
Total	94		Total	146
Aggregate CSIR-SARI and CSIR-CRI (population of the study)				240

Source: 2019 Annual Report

3.4.2 Sample Size:

Faenkel and Wallen (2003) noted that sampling is the process by which a segment is selected to represent the entire population as a whole. The process of sampling makes it possible to draw conclusions through a careful opinion of variables within a small proportion of the population. In sampling the main objective is to select a portion of the universe. A sample in a research study refers to any group from which information is obtained. For the purpose of this study, the researcher used the whole population as the sample size. This is because the number is small and can be managed within the time given.

3.5 Sampling Technique.

A sampling technique is a process of selecting a sample from the population of a study. Fraenkel and Wallen (2003), stated that sampling is the process by which a segment is selected to represent the total population as a whole. The process of sampling makes it possible to notice differences through careful observation of variables within a small percentage of the entire population. The main aim of sampling is to select a percentage of the whole universe. A sample in a research study is said to be any collection from which data is gathered and the larger group to which the result is applied is called the population. The researcher used census techniques. As result, every member of the population was included in the research.

3.5.1 Instrumentation

Instrumentation is the tools/apparatuses that researchers will use to gather or collect. The instrument considered appropriate for this particular research is a questionnaire.

A questionnaire will be the instrument that will be used to collect primary data. This was made up of close-ended and open-ended questions. In total 240 questionnaires were distributed to the research staff of the CIR-SARI and CSIR-CRI who are the target population for this research work.

The questionnaire comprised of five sections with 22 questions; Section A" mainly covers the demographic information of respondents, and section B to E "was grounded on the objectives of the study. Section B focused on Awareness of Electronic Resources, Section C was on the use of electronic resources. Section D on Usefulness and Ease of Use of Electronic resources and Section E: This part of the questionnaire asked research staff to indicate the challenges they encounter in using electronic resources. There were instructions in each section to make it easy for respondents to answer.

3.5.2 Mode of Data Collation

The questionnaire was self-distributed by the researcher. This was done in two ways. First, a google form of the questionnaire was designed and administered remotely to the researcher staff through their WhatsApp numbers and email addresses. Hard copies of the questionnaire were printed and administered to those who could not be reached through WhatsApp and by email. The questionnaire was given out within the first two (2) weeks of July 2021 and administered to research staff who were willing to participate.

3.6 Pilot Testing

Data were collected using a self-administered questionnaire. The researchers developed the questionnaire using information from various sources. The questionnaire comprises a closed-ended type of questions. Four (4) research staff with extensive working experience in e-resources evaluated a draft of the questionnaire to determine whether it measured the intended variables. The suggestions received from the panel were incorporated into the questionnaire administered. A pilot testing was conducted. A total of 10 copies of questionnaire were randomly distributed to research staff of CSIR-Animal Research Institute. All comments made and errors detected were taken into consideration and then used to modify the final questionnaire to ensure reliability and validity.

3.7 Data Analysis and findings

Data collected from the questionnaire administered were analyzed using descriptive statistics. This means of analysing data use frequency count, percentages, and tables to determine an outcome of an event. Data collected from the respondents by the researcher was analysed with the aid of Statistical Package for the Social Sciences (SPSS) (Nie et. al, 1970). This is a software application programme that is used to statistical analyse, data and for constructing table and graphs that summarizes the data collected. Therefore the results are presented in tables for easy interpretation. The data was captured, coded, and analysed. The results were presented descriptively, showing simple frequencies tables, percentages and bar charts.

According to Arkkelin (2014), SPSS is the most popular software within both academic and business circles, making it the most widely used package. SPSS is also a versatile package that allows many different types of analyses, data transformations, and forms of output - in short, it will more than adequately serve our purposes.

Also, responses from respondents of the two institutes will be cross-presented by variables that will be of interest to show the existence of differences and relationships. Student t-test values will be added to tables, to statistical tests the association between the two institutes' use of e-resources based on the data observed.



CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

Analysing data is the final step in the research process. The analysis serves as the connection between raw data and major findings leading to conclusions. This process of analysis should be result oriented. It is the connection between raw data and meaningful results that leads to a conclusion. In other words, it should aim at setting objectives and hypotheses. According to Richard Budd, analysis leads eventually to summarizing procedures resulting in some sacrifice of details. This present study reports an analysis of the data gathered from the questionnaire designed for the research staff of CSIR-SARI and CSIR-CRI. Thus, the chapter presents the analysis and findings of this study. The section deals with the interpretation of data that have been gathered or collected from the field. It seeks to apply reasoning to interpret the raw data gathered in the field to bring out understanding. The findings have been arranged under a major theme and sub-themes are taken into consideration the objectives of the study.

4.2 Response Rate

The total population of the survey was 241, which includes 94 research staff from CSIR-SARI and 147 research staff from CSIR-CRI. In CSIR-SARI total of 94 questionnaires were distributed and 67 (71 percent) users returned the questionnaires. In CSIR-CRI also total of 147 questionnaires were distributed and 96 (65 percent) responded to the questionnaires. Overall, out of the two-hundred and forty-one (241) copies of the questionnaire that were administered to the respondents in both institutes, a total of one

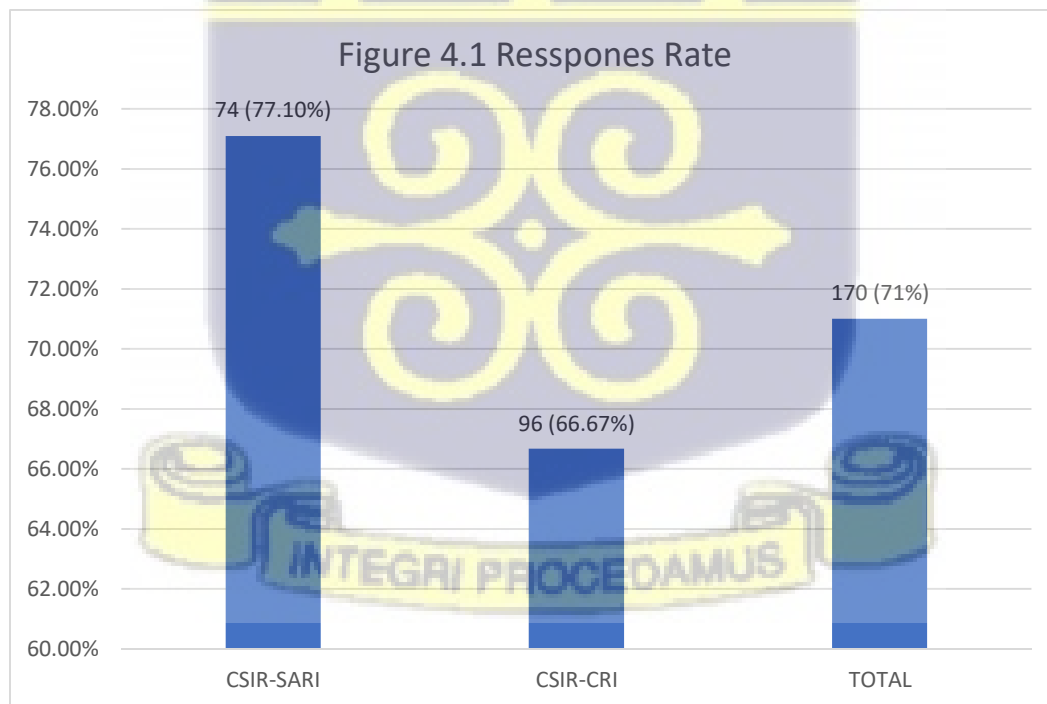
hundred and seventy (170) responded to the survey. A response rate of 71% was achieved. According to Babbie (2005), the response rate for a survey study of this nature sufficient for analysis and communication must be at least 50%. Babbie (2013) further said a response rate of sixty percent (60%) is good while 70% (70%) is very good. The analysis and interpretation of the data gathered through questionnaires distributed to target users are presented in the following.

4.3 Demographic Characteristics of Respondents

This presents the demographic features of the respondents. The features of the respondents included in the survey were the institutes' responses and gender, and these are presented in subsections 4.3.1 and 4.3.2

4.3.1 Institutes Responses/Response rate

Responses from each of the two institutes are shown in Figure 4.1



Source: Field Data, 2021

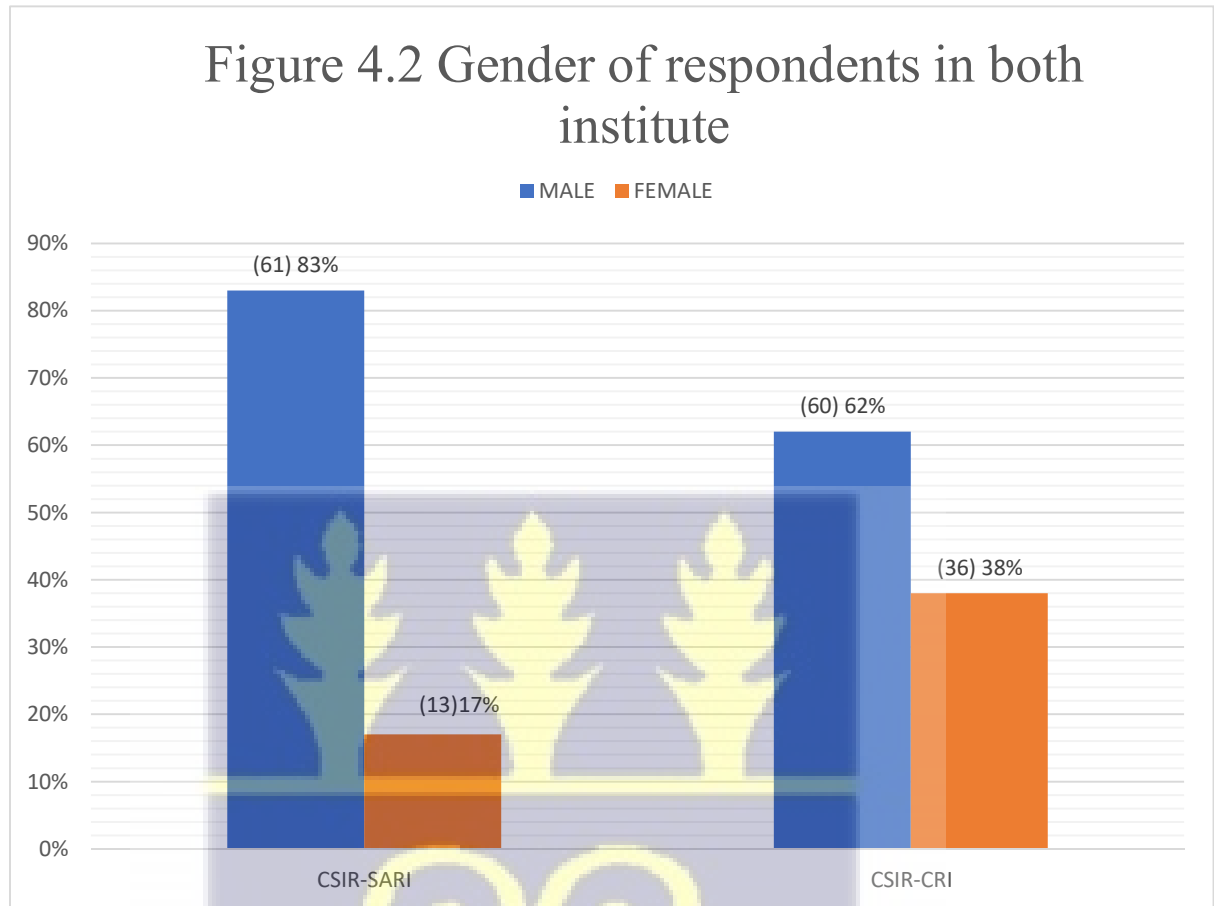
Figure 4.1: shows that 74 research staff representing 77.10% of the population in CSIR-SARI responded to the questionnaire. 96 research staff representing 66.67% of the population in CSIR-CRI agreed to answer the questionnaire. The total respondents were 170 representing 71% of the entire population of 240. This gives an indication that out of the total population of two hundred and forty (240) population, one hundred and seventy 170 representing 71% of research staff from both institutes agreed to respond to the questionnaire.

The findings show the response rate in CSIR-SARI was higher as compared to responses received from CSIR-CRI.



4.3.2 Gender of Respondents.

Respondents were asked to specify their gender and the results are presented in Table 4.2.



Source: Field data

Figure 4.1 shows that 83 % of those who responded to the questionnaire in CSIR-SARI were males whilst 17% who answered the questionnaire were females. In CSIR-CRI 62 % of those who responded to the questionnaire were males whilst 38% of respondents who answered the questionnaire were. This implies that there were more male respondents than female respondents. The results also show that female responses in CSIR-CRI were higher than female responses from CSIR-SARI.

4.4 TYPES OF E-RESOURCES USED

The first objective of the research was to compare the types of e-resources used by the research staff of CSIR-SARI and CSIR-CRI. Figure 4.3 show the responses



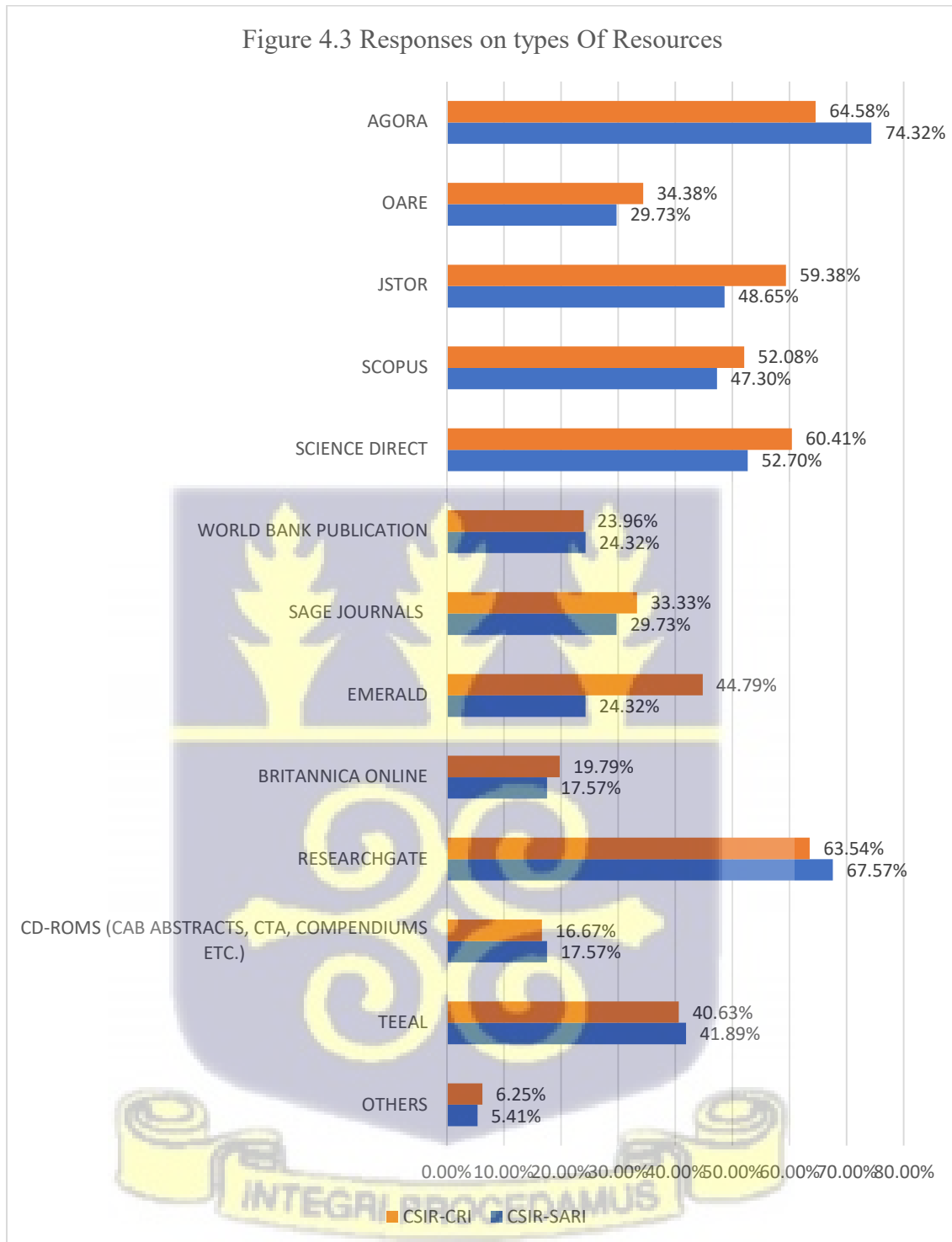


Figure 4.3 above shows revealed that majority of respondents in both institutes used AGORA regularly, i.e. 55 (74.32%) and 62(64.58%) respondents from CSIR-SARI and

CSIR-CRI respectively use AGORA regularly. The second most used e-resources are ResearchGate for CSIR-SARI (67.57%) and (65.60%) for CSIR-CRI (63.54%). The third most regularly use e-resources is science direct (65.60%) for CSIR-SARI and 58 (62.40%) for CSIR-CRI. The third most regularly used e-resources were SCIENCEDIRECT (52.70%) for CSIR-SARI and 58 (52.41%) for CSIR-CRI. JSTOR came out as the next regularly use e-resource by research staff of both institutes i.e.36 (48.65%) and 57 (69.38%) respondents from CSR-SARI and CSIR-CRI respectively. Further analysis showed that SCOPUS recorded 35 (47.30%) for CSIR-SARI and 50 (53.80%) for CSIR-CRI. 36 (20.73%) and 47 (43.38%) respondents from CSIR-SARI and CSIR-CRI respectively revealed they use OARE. 36 (24.32%) and 47(23.96%) respondents from CSIR-SARI and CSIR-CRI respectively use World Bank publications. 36 (29.73%) and 47(33.33%) respondents from CSIR-SARI and CSIR-CRI respectively showed that they use |SAGE Journals regularly. Furthermore, 36 (24.32%) and 47 (44.79%) respondents from CSIR-SARI and CSIR-CRI respectively opined they use EMERALD. BRITTANCA ONLINE recorded 36 (17.57%) responses for CSIR-SARI and 47(19. 79%) responses for CSIR-CRI. 36 (17.57%) and 47(16.67%) respondents from CSIR-SARI and CSIR-CRI respectively use CD-ROMS. 36 (41.89%) and 47 (40.63%) respondents from CSIR-SARI and CSIR-CRI respectively use TEEAL to access information. Those who use other e-resources were 36 (5.41%) and 47 (6.25%) respondents from CSIR-SARI and CSIR-CRI respectively.

The findings revealed that Majority of respondents in both institutes use AGORA for their research work whilst CD-ROMS and Compendiums have been the least e-resources used.

4.5 AWARENESS OF ELECTRONIC RESOURCES

The second objective of the research was to examine the awareness of e-resources by research staff. To this end, specific themes were examined. General awareness, specific types of e-resources, means by which respondents get to know about e-resources and level of awareness.

4.5.1 Research staff awareness of e-resources was sought. Table 4.1 present the results.

Table 4.1 Responses on awareness of electronic resources

Awareness	INSTITUTES				N	240
	CSIR-SARI		CSIR-CRI		Total responses	Percentages
	No.	%	No.	%		
Yes	71	95.95	95	98.96	166	97.65
No	3	4.05	1	1.04	4	2.35
Total	74	100	96	100	170	100

Source: Field data, 2021

The results in Figure 4.1 show that a significant number of the respondents in both institutes are aware of electronic resources. 71 (95.95 percent) and 95 (98.96 percent) in CSIR-SARI and CSIR-CRI respectively responded yes that they are aware of e-resources. Only 3 (4.05 percent) and 1 (1.04 percent) in CSIR-SARI and CSIR-CRI respectively responded no that

they are not aware of e-resources. In total, 166 (97.65 percent) agreed that they are aware of e-resources whilst 4 (2.35 percent) respondents indicated that they are not are of e-resources.

The findings imply that nearly 100% of research staff are aware of e-resources and research staff of CSIR-CRI are more aware.

4.4.3 Specific categories of e-resources awareness

To find out the various sorts of electronic resources respondents were aware of, responses were sought based on the under-listed categories of e-resources. Table 4.2 below shows the responses.

Table 4.2: Responses on awareness of specific types of Electronic Resources

E-resource Awareness	INSTITUTES				N	240
	CSIR-SARI		CSIR-CRI			
	No.	%	No.	%		
A CD ROMS	46	23.8	62	21.5	108	22.45
Compendiums	15	7.80	54	18.8	69	14.35
On-line Public Access Catalogue (OPAC)	67	34.7	82	28.5	149	30.98
Academic Databases	59	30.6	83	28.8	142	29.52
Others	2	1.0	5	1.7	7	1.45
Not aware	4	2.1	2	0.7	6	1.25
Total	236	100	288	100	481	100

Source: Field data, 2021

Table 4.2 highlights that 46 (23.80 percent) and 62 (21.50 percent) in CSIR-SARI and CSIR-CRI respectively are aware of CD-ROMS. 15 (7.80 percent) and 54 (18.80 percent) in CSIR-SARI and CSIR-CRI respectively are aware of Compendiums. Also, 59 (30.60 percent) and 83 (28.80 percent) in CSIR-SARI and CSIR-CRI respectively are aware of Academic database's. 2 (1.0 percent) and 5 (1.7 percent) in CSIR-SARI and CSIR-CRI respectively indicated they are aware of other e-resources. Only 4 (2.10 percent) and 2 (0.70 percent) in CSIR-SARI and CSIR-CRI respectively indicated that they are not aware of resources. In total, 108 (22.45 percent) are aware of CD-ROMS. 69 (14.35 percent) are aware of Compendiums. 149 (30.89 percent) and 7 (1.45 percent) are aware of Academic database's and other e-resources respectively. A total of 6 (1.25 percent) indicated they are not aware of e-resources. Further analysis found that majority of respondents i.e 67 (34.70 percent) in CSIR-SARI are aware of OPAC while a majority of respondents i.e. 83 (30.60 percent) in CSIR-CRI are aware of academic database. A significant number of respondents are aware of both OPAC and academic databases. The findings demonstrated that majority of respondents are aware of these categories e-resources and research staff of CSIR-CRI. On-line Public Access Catalogue (OPAC) is the most aware e-resources among the others.

4.5.4 Means by which respondents got to know about electronic e-resources

This section of the results looked at how respondents got to know about e-resources. Table 4.3 shows the results.

Table 4.3 Responses by which respondents got to know about these e-resources

How do respondents get to know about e-resources	INSTITUTES				N 240	
	CSIR-SARI		CSIR-CRI		Total Responses	Percentages
	No.	%	No.	%		
The library	42	26.92	66	28.32	108	27.76
Notices	55	35.26	64	27.47	119	30.59
Flyers	23	14.74	46	19.74	69	17.74
Newsletters	22	14.10	36	15.45	58	14.91
Posters	14	8.98	21	9.02	35	9.00
Total	156	100	233	100	389	100

Source: Field data, 2021

The responses that were gathered showed that 42 (26.92%) and 66(28.32%) respondents from CSR-SARI and CSIR-CRI respectively got to know about e-resources through the library. 55(35.26%) and 64(27.47%) respondents from CSR-SARI and CSIR-CRI respectively got to know about e-resources through the notices. Those respondents who got to know about e-resources through flyers were 23 (14.74%) and 46(19.74%) from CSIR-SARI and CSIR-CRI respectively. Additionally, 22 (14.10%) and 36 (15.45%) from CSIR-SARI and CSIR-CRI respectively got to know about e-resources through Newsletters. 14

(8.98%) and 21 (9.02%) from CSIR-SARI and CSIR-CRI respectively got to know of e-resources through Posters.

In total 108 (27.76%) of the respondents got to know about e-resources through the library. 119 (30.59%) of the respondents got to know e-resources through Notices. 69 (17.74%) of the respondents revealed that they got to know e-resources through flyers. Also, a total of 58 (14.91) and 35 (9.00%) indicated that they got to know about e-resources through newsletters and posters respectively.

Further analysis reveals majority of respondents indicated they got to know e-resources through notices. That the results show that notices were the highest means by which respondents got to know about e-resources.

4.5.5 Level of awareness of E-Resource

Respondents were also required to give their views on their level of awareness of e-resources Figure 4.4 displays the responses from respondents.

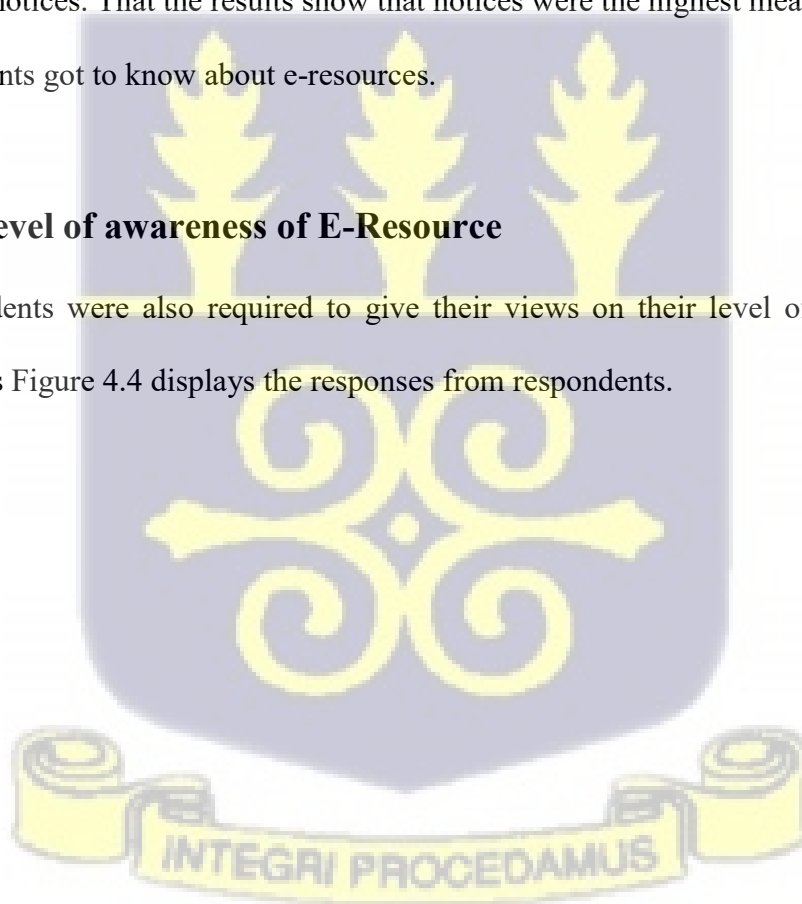
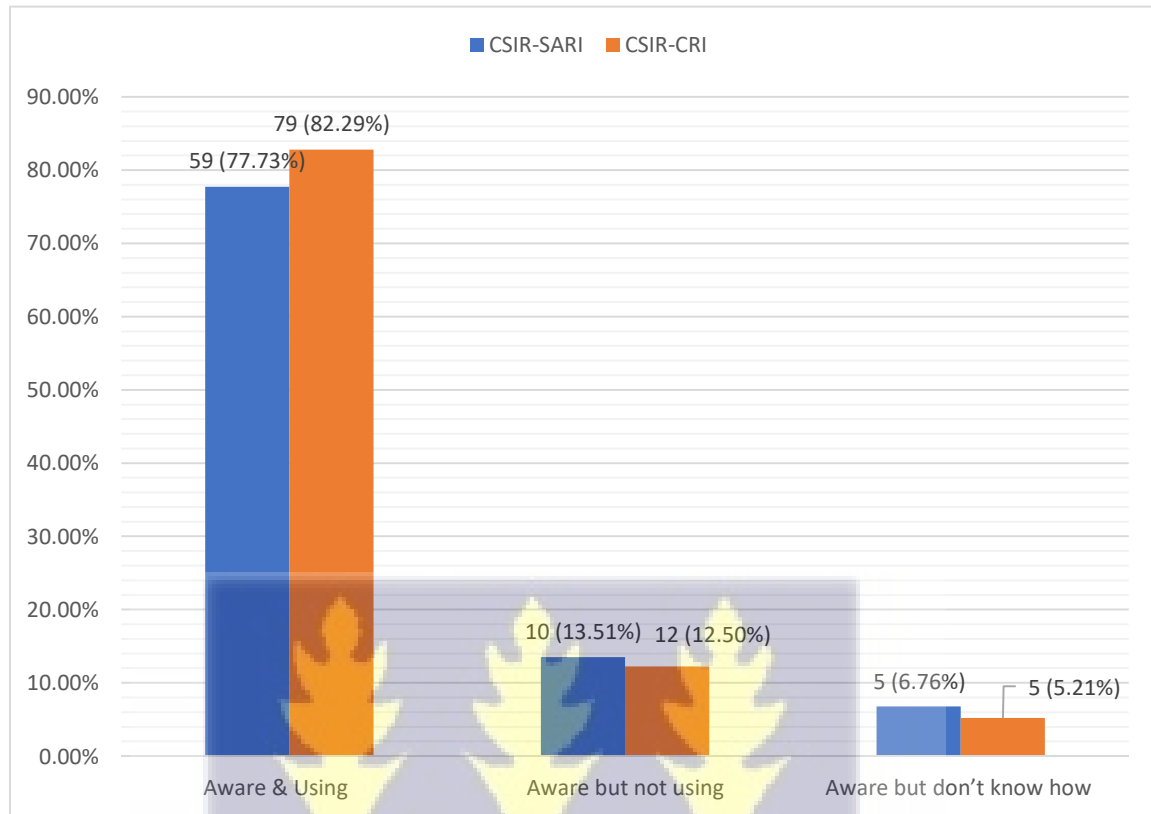


Figure 4.4 Responses on the level of awareness



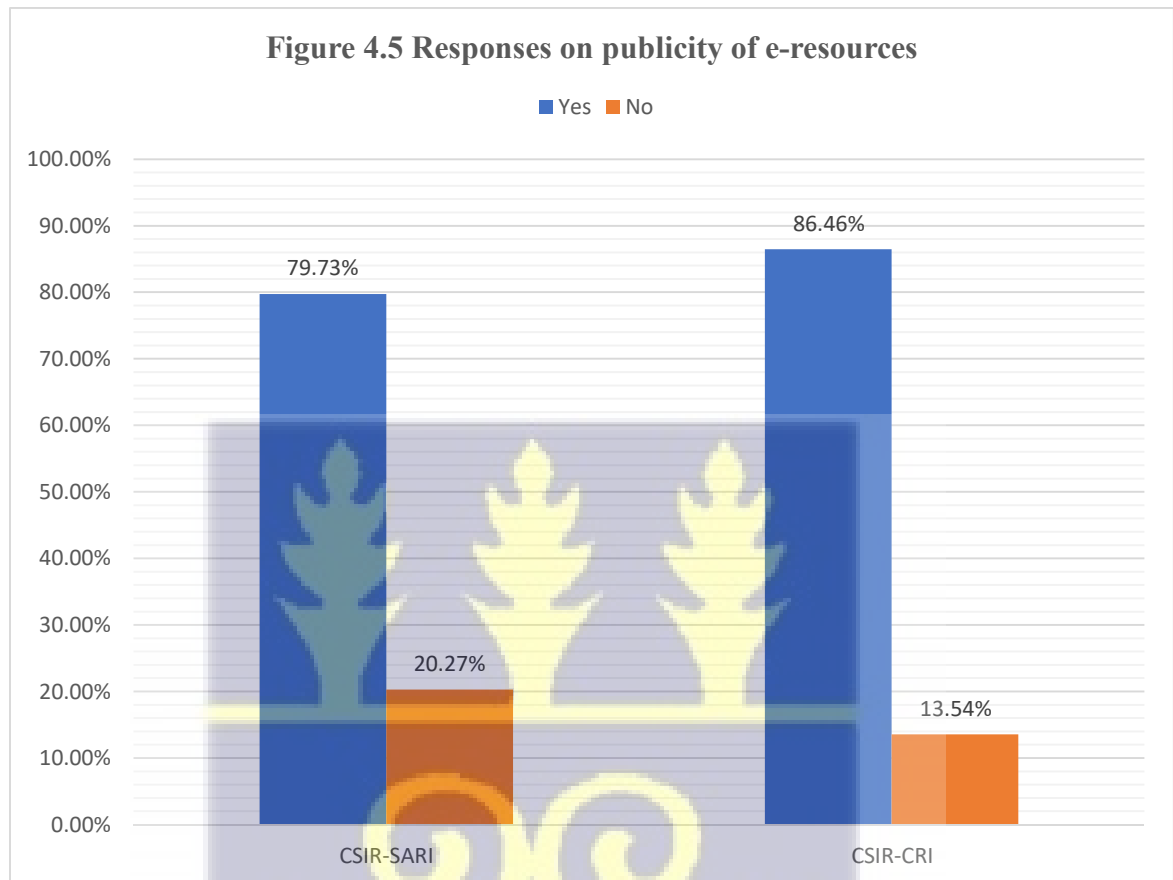
Source: Field data

The response in Figure 4.4 shows that 59 (77.73 percent) and 79 (82.29 percent) in CSIR-SARI and CSIR-CRI respectively indicated that they were aware and used e-resources for their research work. 10 (13.51 percent) and 12 (12.50 percent) revealed they were aware but don't use e-resources. Lastly, 5 (6.76 percent) and 5 (5.21 percent) of respondents in CSIR-SARI and CSIR-CRI respectively opened they were aware but don't know how to use e-resources.

The findings implied that majority of respondents are aware and use e-resources and the research staff of CSIR-CRI are more aware. However, there are a number respondents who revealed they are aware but don't use e-resources.

4.5.7 Publicity of e-resources to research staff

The study also tried to establish whether or not e-sources are well publicized to research staff. Figure 4.5 shows the responses.



Source: Field data

The responses in Figure 4.4 show that 70 (79.73 per cent) and 94 (86.46 per cent) in CSIR-SARI and CSIR-CRI respectively respondents indicated that e-resources have been well-publicized to researchers. Only an insignificant number in both institutes indicated that e-resources have not been well-publicized i.e. 15 (20.27 percent) and 13 (13.54 percent) in CSIR-SARI and CSIR-CRI respondents respectively.

This implied the majority of respondents felt that e-resources are well publicised to research staff of CSIR-SARI and CSIR-CRI.

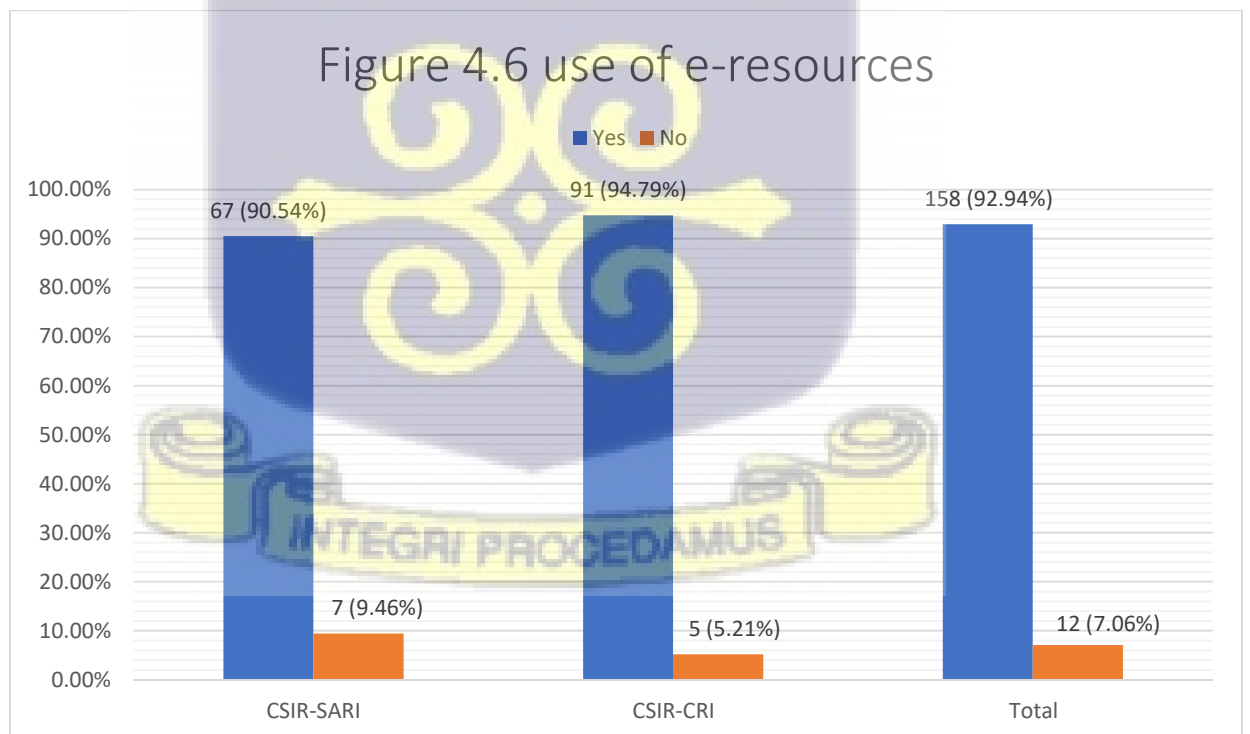
4.6 USE AND EASE OF USE OF E-RESOURCES

The third objective of the study was to determine the use and 'ease of use of e-resources. Under this theme, several queries were made to the research staff to find out from them if they use e-resources and how easy was it for them to obtain the needed information. Therefore, the section looks at the use of e-resources, frequency of use, level of competence, and ease of use.

4.6.1 The use of e-resources by Research staff

Respondents' views were solicited on the use of e-resources to access the needed information for their research work. The results are shown in figure 4.5

Figure 4.6 Responses on the use of e-resources



Source: Field data

The results in Figure 4.5 show that 67 (90.54 percent) and 91(94.75 percent) of CSIR-SARI and CSIR-CRI research staff respectively showed that they use e-resources in their daily activities. Whiles, 7 (9.46 percent) and 5 (5.21 percent) in CSIR-SARI and CSIR-CRI respondents respectively indicated that they do not use e-resources in their daily research work. In total 158 (92.94 percent) showed that they use e-resources in their daily research work whiles 12 (7.06 percent) revealed that they do not use electronic resources in their daily research work.

The finding shows that over 90% of respondents in both institutes use e-resources for their daily research work.

4.6.2 Frequency of use of E-Resources by research staff.

This objective of the study accessed on average how frequently research staff uses electronic resources in their work and research activities. The responses are shown in Table 4.4.

Table 4.4: Frequency of electronic resources use

Frequencies of use of e-resources	INSTITUTES				N 240	
	CSIR-SARI		CSIR-CRI		Total Responses	Percentage
	No.	%	No.	%		
Daily	36	48.65	47	48.96	83	48.82
Weekly	21	28.38	26	27.08	47	27.65
Fortnightly	6	8.11	9	9.38	15	8.82
Monthly	2	2.70	7	7.29	9	5.29
Occasionally	9	12.16	7	7.29	16	9.00
Total	74	100	96	100	170	100

The results of the study revealed a significant number of research staff in both institutes use electronic resources daily. Further analysis shows that 36 (48.65%) and 47 (48.96%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources daily. 21 (28.38%) and 26 (27.08%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources weekly. Additionally, 6 (8.11%) 21(28.38%) and 9 (9.38%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources fortnightly. 2(2.70%) and 7(7.29%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources monthly and those respondents who occasionally, use e-resources were 9 (12.16%) and 7 (7.29%) from CSIR-SARI and CSIR-CRI respectively.

In total 83 (48.82%) of the respondents use e-resources daily. 47 (27.65%) of the respondents use e-resources weekly. 15 (8.82%) of the respondents use e-resources fortnightly. Furthermore, a total of 9 (5.29%) and 16 (9.00%) indicated that they use e-resources monthly and occasionally posters respectively.

This shows that majority of the respondents use electronic resources daily for their research activities.

4.6.3 Frequency of e-resources use based on level of competence

The research found out the level of competence has an impact on frequency of use of e-resources by respondents. With this, frequency of social media site visits was cross tabulated by level of competence. The results are presented in Table 4.7.

Table 4.5 Responses on the frequency of e-resource use by level of competence

FREQUENCY_OF_ERESOURCE_USAGE * LEVEL_OF_COMPETENCES

Crosstabulation

Count		LEVEL_OF_COMPETENCES										Total N = 240 No. %	
		Excellent		Very Good		Good		Fair		Poor			
		No.	%	No.	%	No.	%	No.	%	No.	%		
FREQUENCY OF E-RESOURCE USAGE	Daily	33	19.41	41	24.12	9	5.29	1	0.59	0		84	49.41
	Weekly	11	6.47	23	13.53	9	5.29	1	0.59	3	1.76	47	27.64
	Fortnightly	3	1.76	6	3.53	4	2.35	0		1	0.59	14	8.24
	Monthly	1	0.59	1	0.59	5	2.94	2	1.17	0		9	5.29
	Occasionally	4	2.35	6	3.53	3	1.76	3	1.76	0		16	9.41
Total		52	30.59	77	45.29	30	17.65	7	4.12	4	2.35	170	100
X ² = 43.52		D/F = 16				Significance = .001							

The results in Table 4.5 shows that there is a significant relationship between frequency of e-resource use and the level of competence of research staff at a significance level of 0.001. The results also show that as many as 170 respondents from both institutes gave an indication that the level of their competence influences the frequency at which they use e-resources to access information.

4.6.3 Ease of use

To know whether research staff finds e-resources easy to use, the opinions of the respondents were sought. The responses are shown in Table 4.6

Table 4.6 Responses on easy to use of e-resources

Ease of use	CSIR-SARI		CSIR-CRI		Total = 240	
	No.	%	No.	%	Total Responses	Total percentages
Yes	62	83.78	86	89.58	148	87.06
No	12	6.22	10	10.42	22	12.94
Total	74	100	96	100	170	100

Source: Field data

The results in Table e 4.5 show that 62 (83.78 percent) and 86 (89.58 percent) respondents in CSIR-SARI and CSIR-CRI respectively indicated that e-resources are easy to use. However, 12 (16.22 percent) and 10 (10.42 percent) respondents in CSIR-SARI and CSIR-CRI respectively indicated that they do not find e-resources easy to use. In total 148 (87.06 percent) of respondents indicated that they find e-resources easy to use whilst, 22 (12.94 percent) respondents disclosed that they do not find e-resources easy to use.

The findings revealed that majority of research staff find e-resources easy to use.



4.6.4 Level of competence in using electronic resources

Notwithstanding the fact that respondents have revealed that they find e-resources easy to use, the study further assesses, their level of competence in using e-resources. The results are shown in Table 4.7

Table 4.7: Responses on level of competence in using e-resources

level of competence	INSTITUTES				N = 240	
	CSIR-SARI		CSIR-CRI		Total responses	Percentage
	No.	%	No.	%		
Excellent	19	25.67	30	31.25%	49	28.82%
Very good	36	48.65	43	44.79	79	46.47
Good	13	17.57	15	15.63	28	16.47
Fair	4	5.41	7	7.29	11	6.47
Don't know	2	2.70	1	1.04	3	1.77
Total	74	100	96	100	170	100

Source: Field data 2021

The results show that a significant relationship of respondents in both institutes indicated that they are very good at using e-resources i.e. 36 (48.65%) and 43 (44.97%) respondents from CSIR-SARI and CSIR-CRI respectively. This is closely followed by those respondents who feel they are excellent at using e-resource, i.e. 19 (25.67%) and 30 (31.25%) respondents from CSIR-SARI and CSIR-CRI respectively. Furthermore, 13 (17.57%) and 15 (15.63%) respondents from CSIR-SARI and CSIR-CRI respectively indicated they are good at using e-resources. 4 (7.29%) and 7 (5.41%) respondents from CSIR-SARI and CSIR-CRI respectively revealed they have a fair knowledge of using e-

resources. Those who don't know their level of competence were only 2 (2.70%) and 1 (1.04%) from CSIR-SARI and CSIR-CRI respectively.

In total 49 (28.82%) of respondents feel they are excellent at using e-resources. 79 (46.47%) of the respondents indicated they are very good at using e-resources. 28 (16.47%) of the respondents indicated they are good at using e-resources. 11 (6.47%) of the respondents indicated they have a fair knowledge of using e-resources and 3 (1.77%) revealed they do not know their level of competence.

The findings show 79 (46.47%) of respondents forming the majority felt that there were 'very good at using e-resources to access information.

4.6.5 Preference of e-resources to print information materials

If e-resources are easy to use, subjects would prefer them to other means of accessing information. Based on this, respondents were further assessed on their preference of e-resources to print materials. Table 4.8 represents the results.

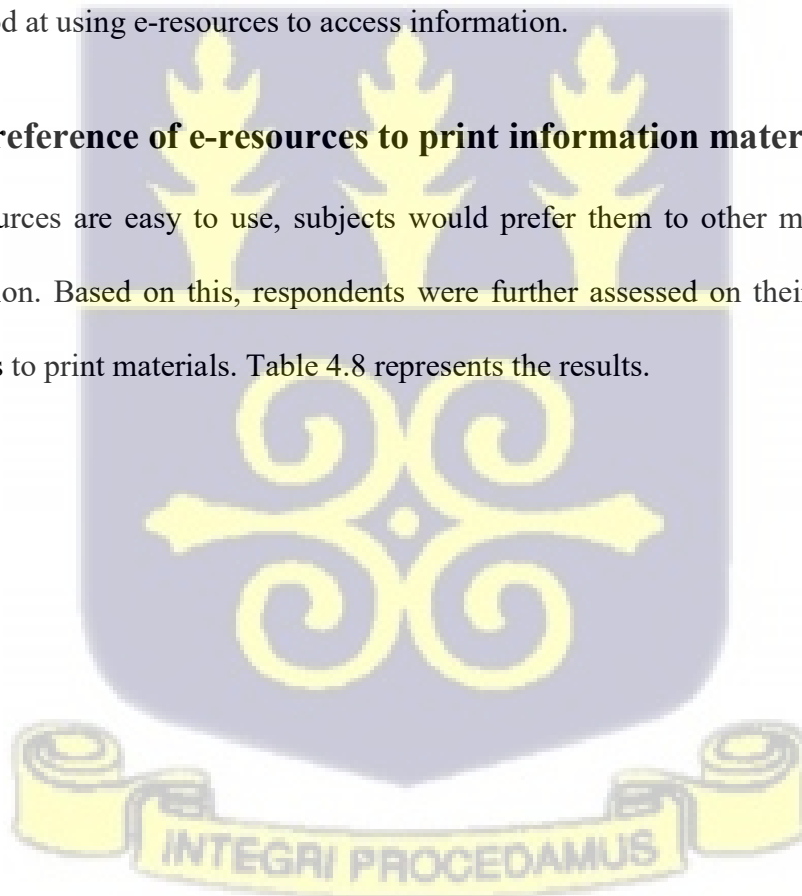


Table 4.8 preference of e-resources to print materials

Preference e-resource use to print	INSTITUTES				N 240	
	CSIR-SARI		CSIR-CRI		Total Responses	Percentages
	No.	%	No.	%		
It is time saving	37	50.00	62	64.58	99	58.24
It is easy to use	21	28.38	18	18.75	39	22.94
It is more useful	8	10.81	11	11.46	19	11.18
I can retrieve current information	8	10.81	5	5.21	13	7.64
Total	74	100	96	100	170	100

Source: Field data 2021

The results show that majority of respondents in both institutes opined the e-resources are time saving i.e. 37 (50.00%) and 62 (64.58%) respondents from CSIR-SARI and CSIR-CRI respectively. 21 (28.38%) and 18 (18.75%) respondents from CSIR-SARI and CSIR-CRI respectively revealed that e-resources are easy to use. Also, 8 (10.81%) and 11 (11.46%) respondents from CSIR-SARI and CSIR-CRI respectively showed that e-resources are more useful to their research work. Last retrieving current information recorded 8 (10.81%) from CSIR-SARI respondents and 2 (5.21%) from CSIR-CRI respondents. In total 99 (58.24%) of the respondents reveal that e-resources are time saving. 39 (22.65%) respondents showed that e-resources are easy to use. 19 (11.18%) respondents indicated that e-resources are more useful and a total of 13 (7.64%) declared that e-resources enable them to retrieve current information.

The results show that majority of respondents in both institutes opined that e-resources are time-saving.

4.7 USEFULNESS OF E-RESOURCES

This section of the objectives was to assess the usefulness of e-resources to research staff of CSIR-SARI and CSIR-CRI. To achieve this objective some questions were posed to subjects to enable the researcher analyse and come out with findings.

Therefore, responses were sought from subjects regarding their views on the usefulness of e-resources to their research work. Responses of subjects are shown in Table 4.9

Table 4. 9 Responses on the usefulness of e-resources to research work

Usefulness of e-resources	INSTITUTES				N 240	
	CSIR-SARI		CSIR-CRI		Total Responses	Percentages
	No.	%	No.	%		
Yes	72	97.30	96	100	168	98.82
No	2	2.70	0		2	1.18
Total	74	100	96	100	170	100

Source: Field data 2021

The analysis in Table e 4.9 shows that 72 (100 percent) and 96 (100 per cent) respondents in CSIR-SARI and CSIR-CRI respectively indicated that e-resources are useful to their research work. Only 2 (2.70) respondents in CSIR-SARI indicated no to whether e-resources were useful. None of the respondents in CSIR-CRI indicated that they do not find e-resources useful. That is, all respondents in CSIR-S

ARI maintained that e-resources are useful to their research work. However, only 2 subjects in CSIR-revealed e-resources are not useful.

The results show that majority of respondents in both institutes felt e-resources are useful to their research work.

4.10 Impact of e-resource on research work.

A Useful e-resource would have an impact on the user. Responses were, therefore, sought from subjects on the impact e-resources have on their research activities. Figures 4.7 present the views of the respondents.

Figures 4.7 Responses on the impact of e-resources.

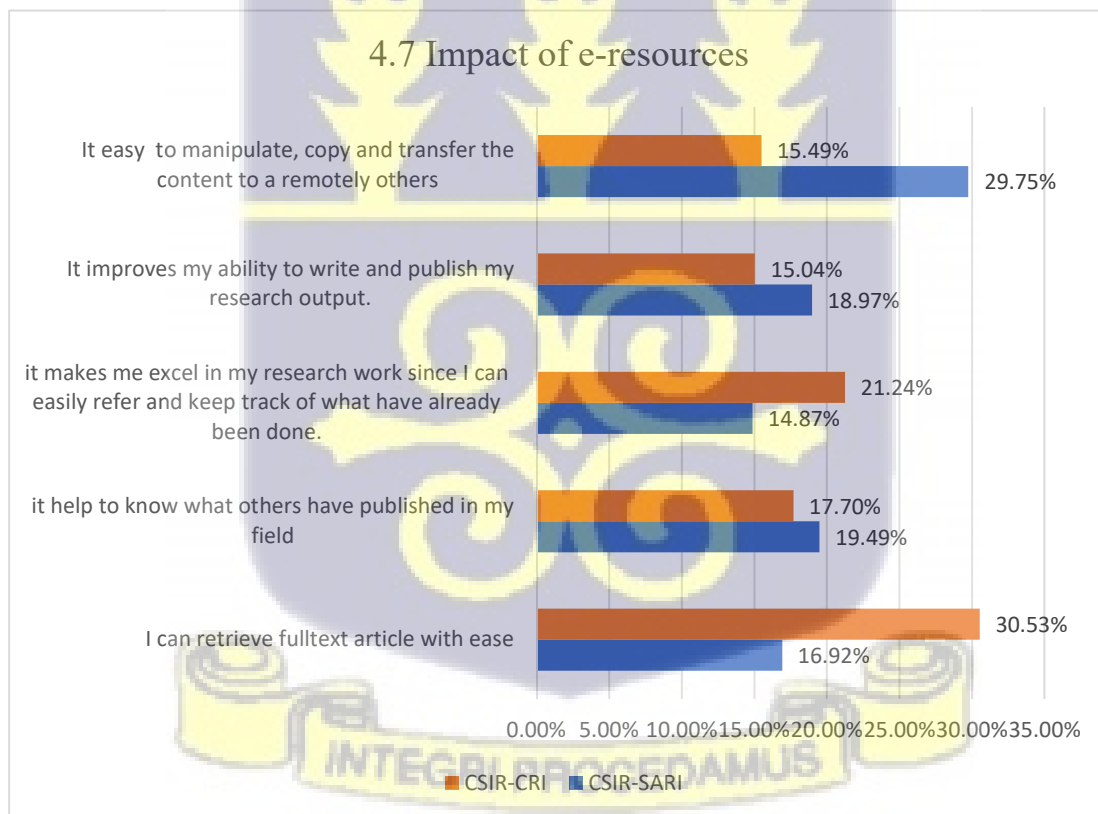


Figure 4.7 revealed that majority of the respondents in CSIR-SARI indicated that they can retrieve full-text articles with ease i.e 30.53%. However, majority of the respondents in

CSIR-CRI showed that It is easy to manipulate, copy and transfer the content remotely to others i.e. 29.75%. Further analysis showed that 58 (29.75 percent) and 35 (15.49 percent) in CSIR-SARI and CSIR-CRI respectively revealed that e-resources are easy to manipulate, copy and transfer the content remotely to others. 37 (18.95 percent) and 34 (15.04 percent) in CSIR-SARI and CSIR-CRI respectively feel It improves their ability to write and publish my research output. 29 (14.87 percent) and 48 (21.24 per cent) respondents of CSIR-SARI respectively, opined that it makes them excel in their research work since they can easily refer to and keep track of what has already been done. 38 (19.49 per cent) and 40 (17.70 per cent) respondents of CSIR-SARI and CSIR-CRI respectively use revealed that it helps them to know what others have published in their field. Lastly, 33 (16.92 per cent) and 69 (30.53 percent) respondents of CSIR-SARI respectfully revealed that they can retrieve full-text articles with ease.

Majority of respondents in CRI felt that “they can retrieve fulltext articles with ease whiles the majority of respondents in SARI feel e-resources are easy to manipulate, copy and transfer to content remotely to others.

4.7.4 Rate of usefulness of e-resources

As part of the usefulness of the study, the rate of usefulness of e-resources to research staff was examined. Table 4.10 presents the results.



Table 4.10 Responses on the rate of usefulness of e-resources to research staff

usefulness of e-resources to research work	INSTITUTES				N 240	
	CSIR-SARI		CSIR-CRI		Total Responses	Percentages
	No.	%	No.	%		
Highly Useful	54	72.97	58	60.42	112	60.42%
Useful	16	21.62	25	26.04	41	96.87%
Little Useful	4	5.41	13	13.54	1351	100%
Not useful	0		0		0	0
Total	74	100	96	100		
$X^2 = 3.56$ D/F = 6 Significance = .001						

Source: Field data 2021

Using Pearson Chi-Square (X^2) test, it is found that a P value (3.56) and a significant level of 0.001, which reveals that significant differences are observed in the usefulness of e-resources among users in under study research institutes.

Table 4.9 discloses that the majority of respondents indicated e-resources are highly useful to their research work. Further analysis shows that 54 (72.97%) and 58 (60.42%) respondents from CSIR-SARI and CSIR-CRI respectively indicated that e-resources are highly useful. 16 (21.62%) and 25 (26.04%) respondents from CSIR-SARI and CSIR-CRI respectively revealed that e-resources are useful. Additionally, 4 (5.41%) and 13 (13.548%) respondents from CSIR-SARI and CSIR-CRI respectively showed that e-resources are little useful and not useful recorded non in both institutes.

The findings implied that majority of research staff felt that e-resources are highly useful to their research work.

4.7.2 Usefulness of specific resources to research work.

After rating the usefulness of e-resources, subjects were asked to rate the usefulness of different types of e-resources to their research work. Table 4.11 present the views of the respondents.



Table 11. Responses of different types of e-resources according to their usefulness to research work.

E-resource	Highly useful		Useful		Little useful		Don't know		Not useful	
	CSIR-SARI	CSIR-CRI	CSIR-SARI	CSIR-CRI	CSIR-SARI	CSIR-CRI	CSIR-SARI	CSIR-CRI	CSIR-SARI	CSIR-CRI
AGORA	48 (64.86%)	34 (35.42%)	17 (22.97%)	47 (48.96%)	6 (8.11%)	12 (12.50%)	3 (4.05%)	2 (2.08%)	0	1 (1.04%)
OARE	14 (18.91%)	15 (15.63%)	30 (40.54%)	36 (37.50%)	14 (18.92%)	15 (15.63%)	14 (18.92%)	21 (21.86%)	2 (2.70%)	9 (9.34%)
JSTOR	25 (33.78%)	35 (35.46%)	33 (44.59%)	44 (45.83%)	11(14.86)	13 (13.54%)	5 (6.76%)	3 (3.13%)	0	1 (1.04%)
SCOPUS	24 (32.43%)	56 (58.33%)	33 (44.59%)	33 (34.38%)	10 (13.51%)	6 (26.25%)	7 (9.46%)	1 (1.04%)	0	0
SCIENCEDIRECT	31 (41.89)	54 (56.25%)	32 (43.24%)	28 (29.17%)	9 (12.16%)	10 (10.42%)	2 (2.70)	3 (3.13%)	0	1(1.04%)
WORLD BANK PUBLICATIONS	9 (12.16%)	15 (15.63%)	19 (25.67%)	24 (25.99%)	19 (25.67%)	21 (21.88%)	19 (25.67%)	21 (21.88%)	8 (10.81%)	15 (15.63%)
SAGE Journals	13 (17.57%)	26 (27.08%)	31 (41.89%)	48 (50.00%)	21 (28.37%)	20 (20.83%)	9 (12.16%)	2 (2.08)	0	0
EMERALD	9 (12.16%)	25 (26.04%)	22 (29.73%)	42 (43.75%)	23 (31.08%)	19 (19.79%)	12 (12.22%)	7 (7.29%)	8 (10.81%)	3 (3.13%)
BRITANICA ONLINE	9 (12.16%)	12 (12.50%)	22 (29.73%)	15 (15.63%)	17 (22.97%)	27 (28.13%)	20 (27.03)	24 (25.00%)	6 (8.11%)	18 (18.75%)
RESEARCHGATE	33 (44.59%)	32 (33.33%)	29 (39.19%)	36 (37.50%)	7 (9.46%)	21 (21.86%)	4 (5.41%)	6 (6.25%)	1 (1.35%)	1 (1.04%)
EBSCO JOURNALS	18 (24.32%)	30 (31.25%)	29 (39.19%)	34 (37.50%)	14 (18.92%)	25 (26.04%)	8 (10.81%)	5 (5.21%)	5 (6.76%)	2 (2.08%)
CD-ROMS	9 (12.16%)	5 (3.19%)	19 (25.68%)	20 (21.28%)	23 (31.08%)	24 (25.53%)	16 (21.62%)	25 (26.60%)	7 (9.46%)	22 (23.40%)
COMPENDIUMS	8 (10.81%)	6 (6.25%)	20 (27.03%)	15 (15.63%)	22 (29.73%)	21 (21.88%)	18 (24.32%)	41 (42.71%)	6 (8.11%)	13 (13.54%)
TEEAL	10 (13.51%)	18 (18.75%)	21 (28.38%)	22 (22.92%)	16 (21.62%)	6 (6.25%)	20 (27.03%)	34 (35.42%)	7 (9.46%)	16 (16.67%)

The findings of the research revealed that a significant number of research staff in both institutes rated the various e-resources as highly useful and somewhat useful. Further analysis shows that majority of respondents from CSIR-SARI i.e. 48 (64.86%) rated AGORA highly useful whiles respondents from CSIR-CRI i.e. 47 (48.96%) respondents

rated AGORA as useful. 34. (35.42%) respondents from CSIR-CRI rated it as highly useful.

Also, majority of respondents from CSIR-SARI and CSIR-CRI i.e. 30 (40.54%) and 36 (37.50%) respectively, rated OARE useful.

For JSTOR majority of respondents from CSIR-SARI and CSIR-CRI i.e. 33 (44.59%) and 44 (45.83%) respectively, rated it as useful.

Additionally, majority of respondents from CSIR-CRI i.e. 56 (58.33%) rated SCOPUS as highly useful whilst CSIR-SARI recorded a majority rating i.e. 33 (44.59%) for SCOPUS as useful.

Moreover, 54 (56.25%) respondents forming the majority, from CSIR-CRI rated SCIENCEDIRECT as highly useful whilst majority of 32 (43.24%) respondents from CSIR-SARI indicated that SCIENCEDIRECT is useful.

Additionally, majority of respondents from CSIR-SARI and CSIR-CRI i.e. 21 (21.88%) and 24 (25.67%) rated WORLDBANK PUBLICATIONS as little useful and useful respectively.

In relation to SAGEJournals majority of respondents from both institutes i.e. CSIR-SARI and CSIR-CRI representing 31 (41.89%) and 48 (50.00%) respectively indicated that it is useful to their research work.

With regards to RESEARCHGATE majority of respondents from CSIR-SARI and CSIR-CRI i.e. 31 (41.89%) and 48 (50.00%) revealed that it is useful to their research work.

EBSCO JOURNALS also had majority of respondents from CSIR-SARI and CSIR-CRI i.e. 29 (31.25%) and 34 (37.50%) rating it as useful to their research work.

However, CD-ROM had majority of respondents from both institutes rating it as little useful. That is 23 (26.04%) and 24 (25.53%) for CSIR-SARI and CSIR-CRI respectively.

Additionally, majority of respondents i.e 20 (27.03%) from CSIR-SARI showed that COMPENDIUMS were useful whilst respondents i.e. 22 (29.73%) from CSIR-CRI revealed that COMPENDIUMS were little useful to their research work.

Last but not the list, TEEAL had majority of respondents from both institutes rating it as useful to their research work. That is 21 (28.38%) and 22 (22.92%) for CSIR-SARI and CSIR-CRI respectively.

Based on the above analysis, it could be deduced that respondents from both institutes revealed that the various e-resources are either highly useful or useful. With exception of CD-ROMS, COMPENDIUMS, and TEEAL which majority of respondents indicated are little useful to their research work, all the other categories of e-resources were rated as either highly useful or useful.

This is an indication that respondents consider the various e-resources as either highly useful or useful to their research work.

4.7.3 Level of satisfaction and coverage of e-resources.

The Findings on the level of satisfaction and coverage of e-resources in CSIR libraries are analysed and shown in Table 4. 12 below.

Table 4.12 Responses level of satisfaction and coverage of e-resources

satisfaction and coverage of e-resources	INSTITUTES				N 240	
	CSIR-SARI		CSIR-CRI		Total Responses	Total Percentages
	No.	%	No.	%		
Highly satisfied	13	17.57	30	31.25	43	25.29
Satisfactory	27	36.49	39	40.63	66	38.82
Fairly Satisfied	19	25.67	16	16.67	35	20.59
Unsatisfactory	15	20.27	11	11.45	26	15.29
Total	74	100%	96	(100%)	170	100

Sources: field data 2021

Majority of the respondents in both the institutes feel satisfied with the level and coverage of e-resources i.e. 27 (36.49 percent) and 39 (40.63 percent) in CSIR-SARI and CSIR-CRI respectively. This is followed by respondents who feel highly satisfied with the level and coverage of e-resources, these respondents constitute, 13 (17.57 percent) and 30 (31.25 percent) in CSIR-SARI and CSIR-CRI respectively. 19 (25.67 percent) and 16 (16.67 percent) in CSIR-SARI and CSIR-CRI respectively feel fairly satisfied with the level and coverage of e-resources. Only 15 (20.27 percent) respondents of CSIR-SARI and 11(11.45 percent) respondents of CSIR-SARI use feel dissatisfied with the level and coverage of e-resources. In total 66 (36.49 percent) of respondents in CSIR feel satisfied with the level and coverage of e-resources. 23 (25.29 percent) of respondents in CSIR feel highly satisfied with the level and coverage of e-resources. 35 (20.59 percent) of respondents in CSIR feel fairly satisfied with the level and coverage of e-resources. The total number and percentage of those who feel dissatisfied with the level and coverage of e-resources were 26(15.29 percent).

The findings revealed that majority of the respondents in both institutes feel satisfied with the level and coverage of e-resources.

Usefulness of e-resources by level of satisfaction and coverage

Table 4.13 Responses on usefulness of e-resources by level of satisfaction and coverage

Usefulness * level of satisfaction coverage of e-resources Crosstabulation											
Count											
		Level of satisfaction and coverage of e-resources								N 240	
		Highly satisfied		Satisfactory		Fairly Satisfied		Unsatisfactory		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
Usefulness	Highly Useful	29	6.62	43	8.92	24	4.98	23	4.77	119	24.69
	Useful	11	2.28	19	3.94	8	1.66	0	0	38	7.88
	Little Useful	3	0.62	4	0.83	3	0.62	3	0.62	13	2.70
Total		43	8.92	66	13.69	35	7.26	26	5.39	482	100
X ² = 5.091E		DF=12		Significance = 0.002							

The results suggest that there is a significant relationship between the usefulness of e-resources and the level of satisfaction and coverage at a significance level of 0.002. The results also show that as many as 170 respondents from both institutes gave an indication that the usefulness of e-resources depends on the level of satisfaction and coverage of those

e-resources. They find e-resources useful when their information need is satisfied by that e-resource. Also if that e-resource covers enough subjects in their field of work.

4.9 CHALLENGES ASSOCIATED WITH THE USE OF ELECTRONIC RESOURCES

The last objective of the study was to find out the challenges of using e-resources.

Figure 4.8 show the responses

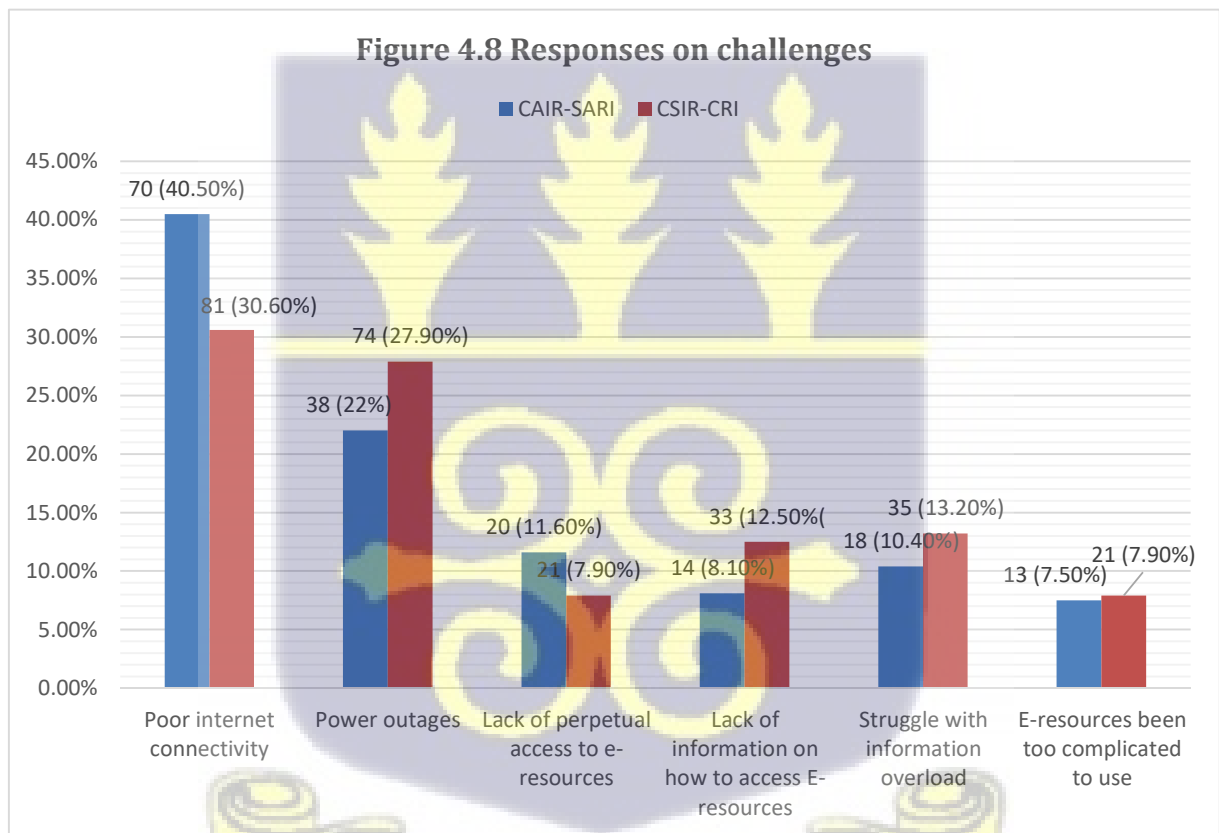


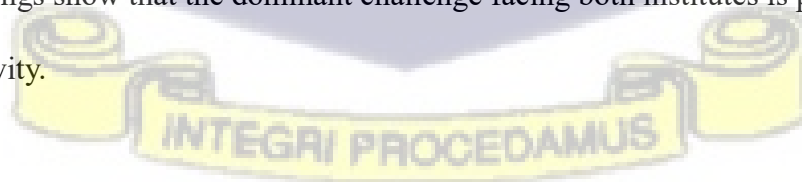
Figure 4.8 shows that majority of the respondents in both the institutes indicated poor internet connectivity as the major challenge faced by research staff in the bit to use e-resources i.e. 70 (40.50 percent) and 81 (30.60 percent) respondents in CSIR-SARI and CSIR-CRI respectively.

The second major challenge as revealed by the research was power outages. The findings show that 38 (22.00 percent) and 74 (27.90 percent) respondents in CSIR-SARI and CSIR-CRI respectively indicated power outages as a challenge to accessing and using e-resources.

Additionally, while respondents in CSIR-SARI indicated lack of perpetual access as the third challenge, respondents in CSIR-CRI revealed that struggle with information overload is the third challenge hindering their smooth access and use of e-resources. That 20 (11.60 percent) respondents in CSIR-SARI said lack of perpetual access is the third challenge while 35 (13.20 percent) respondents in CSIR-CRI indicated struggle with information as the challenge hampering their use of e-resources.

Moreover, the section of the CSIR-SARI respondents with respect to the outstanding challenges encountered with the use of e-resources are lack of information on how to access e-resources 14 (8.10 percent), struggle with information overload 18 (10.40 percent) and e-resources being too complicated to use 13 (7.50 percent). For the CSIR-CRI, 21 (7.90 percent) indicated lack of perpetual access to e-resources 33 (12.50 percent) indicated lack of information on how to access e-resources, and 21 (7.90 percent) feel e-resources are too complicated to use.

The findings show that the dominant challenge facing both institutes is poor internet connectivity.



CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 INTRODUCTION

The purpose of this study was to examine the use of electronic resources by the Research staff of CSIR-SARI and CSIR-CRI for their research activities.

To achieve the main purpose of the study, a survey research methodology was employed. The methodology used for this study has led to several revelations by the research staff from which this particular chapter seeks to discuss. The discussions of the findings are based on issues raised in the objectives. This discussion is presented in six sub-sections. First, the findings on the types of e-resources used are discussed. Secondly, awareness about e-resources in CSIR libraries. Thirdly, findings on use and ease of use of electronic resources by research staff. Next, findings on the usefulness of electronic resources by Research staff. Finally, Findings of challenges" associated with the use of electronic resources by the research staff of CSIR-SARI and CSIR-CRI.

4.1 DEMOGRAPHIC INFORMATION

The demographic information are gender and institutes. This study involved 240 research staff from two institutes of CSIR (CSIR-SARI and CSIR-CRI). The results show that 74 (31%) of the respondents were from the CSIR-SARI and 96 (40%) from CSIR-CRI.

Regarding gender, 83 % of those who responded to the questionnaire in CSIR-SARI were males whilst 17% who answered the questionnaire were females. In CSIR-CRI 62 % of those who responded to the questionnaire were males whilst 38% of females who answered

the questionnaire were female. It is therefore evident from the findings that a larger part of the responses drawn from both institutes were male respondents.

5.2 TYPES OF E-RESOURCES USED BY RESEARCH STAFF

According to AACR2, 2005 Update, an electronic resource is: "Material (data and/or program(s)) encoded for manipulation by a computerized device. This material may require the use of a peripheral directly connected to a computerized device (e.g., CD-ROM drive) or a connection to a computer network (e.g., the Internet). The different types of e-resources the study considered were AGORA, OARE, JSTOR, SCOPUS, SCIENCEDIRECT, WORLDBANK PUBLICATIONS, SAGE JOURNALS, EMERALD, BRITANNICA ONLINE, RESEARCHGATE, CD-ROMS, and TEEAL.

The findings of the study revealed a favourable percentage of regular usage of AGORA, JSTOR, SCOPUS, SCIENCEDIRECT and RESEARCHGATE in both institutes. 55 (74.32%) and 62(64.58%) respondents from CSR-SARI and CSIR-CRI respectively use AGORA regularly. The second most used e-resource was ResearchGate for CSIR-SARI (67.57%) and (65.60%) for CSIR-CRI. The third most regularly used e-resource is SCIENCEDIRECT (65.60%) for CSIR-SARI and 58 (62.40%) for CSIR-CRI. The third most regularly used e-resource was SCIENCEDIRECT (52.70%) for CSIR-SARI and 58 (52.41%) for CSIR-CRI. JSTOR came out as the next regularly use e-resource by research staff of both institutes i.e.36 (48.65%) and 57 (69.38%) respondents from CSR-SARI and CSIR-CRI respectively. Further analysis showed that SCOPUS recorded 35 (47.30%) for CSIR-SARI and 50 (53.80%) for CSIR-CRI. 36 (20.73%) and 47 (43.38%) respondents from CSIR-SARI and CSIR-CRI respectively revealed they use OARE. 36 (24.32%) and 47(23.96%) respondents from CSIR-SARI and CSIR-CRI respectively use World Bank

publications. 36 (29.73%) and 47(33.33%) respondents from CSIR-SARI and CSIR-CRI respectively showed that they use |SAGE Journals regularly. Furthermore, 36 (24.32%) and 47 (44.79%) respondents from CSIR-SARI and CSIR-CRI respectively opined they use EMERALD. BRITTANCA ONLINE recorded 36 (17.57%) responses for CSIR-SARI and 47(19. 79%) responses for CSIR-CRI. 36 (17.57%) and 47(16.67%) respondents from CSIR-SARI and CSIR-CRI respectively use CD-ROMS. 36 (41.89%) and 47 (40.63%) respondents from CSIR-SARI and CSIR-CRI respectively use TEEAL to access information. Those who use other e-resources were 36 (5.41%) and 47 (6.25%) respondents from CSIR-SARI and CSIR-CRI respectively.

This shows that majority of respondents use most of these e-resources regularly with CD-ROMS being the least. This is consistent with research conducted Mwantimwa, Elia & Ndenje-Sichalwe (2017) on the “Utilisation of E-Resources to Support Teaching and Research in Higher Learning Institutions, Tanzania”. Their results show that 83 (48.7%) of the academic staff and researchers used Emerald, 58 (48.1%) JSTOR, 37 (31.1%) SAGE Publications, 33 (27.7%) Taylor and Francis, 29 (24.4%) Cambridge University Press, 27 (22.7%) IMF e-Library and 26 (21.8%) said they accessed and used Wiley Online Library Full. These results imply that Emeralds, JSTOR and Sage Online Journals were accessed and used by noticeable percentage of academic and research staff.

Similarly, a study conducted by Manjack, Dangani, and Fari (2019), revealed that electronic journals with a frequency of 179 have the highest response rate more than any others in GSU, E-books have 174, E-newspapers have 172, AGORA has 158, E-magazines have 151, Institutional Repository has 148, Science Direct has 128, TEEAL has 121, HINARI has 113, JSTOR has 73, DVD has 43 and CD-ROMs with the frequency of 25

have the lowest response rate. In FUK the electronic books with a frequency of 86 have the highest response rate more than any others, E-newspapers have 83, E-journals and E-magazines have 79 each, AGORA has 63, Institutional Repository has 62, HINARI has 56, Science Direct has 52, CD-ROMs have 49, OARE has 47, TEEAL has 42 and DVDs with a frequency of 14 have the lowest response rate. They concluded that electronic books with a mean of 130.0 have the highest mean while DVD with a mean of 28.5 has the lowest mean.

Moreover, e-resources such as ACM, AGORA, TEAL, EBSCOHOST, HINARI, IEEE, IET, Science Finder, JSTOR, EMERALD, Scopus, ProQuest, ERIC, McGraw Hill e-books, Pearson e-books, and e-library were heavily used by researchers and academic staff of different universities (Egberongbe, 2011; Santhi and Gopalakrishnans; 2016).

5.3 AWARENESS OF ELECTRONIC RESOURCES

A research conducted by Acheampong, et al. (2020). On Investigating Awareness and usage of Electronic Resources by Research Scientists in Ghana, revealed that all respondents (100 %) indicated that they were aware of e-resources. The study revealed a very high level of access to electronic resources among researchers in CSIR. That is, 92 per cent of researchers at CSIR have access to electronic resources while 8 per cent indicated that they did not have access to electronic resources in their institutes. Eight 8 per cent of the respondents who did not have access to electronic resources blamed it on the lack of inadequate internet infrastructure in their various institutes.

Similarly, Ansari (2020) in his study Use and Awareness of E-resources among Research Scholars of Literature Subjects in Banaras Hindu University revealed that most of the

respondents were aware of the features of e-resources. They are aware that e-resources are available online and give innovative ways of searching according to the need for information. It provides multiple access and provides bibliographic data, abstract and full text. Some respondents were confused about the feature of e-resource.

The finding of Nanda (2017) also shows that 98.21% of faculty members and 100% of research scholars were aware of e-journals. His results show that 92.85% of Faculty and 84.74% research scholars know about the online database subscribed by their library.

The present study confirm the above studies in terms of research scholars' awareness of e-resources. 70 (94.60 per cent) and 94 (97.90 per cent) in CSIR-SARI and CSIR-CRI respectively responded yes that they are aware of e-resources. Only 4 (5.40 per cent) and (2.10 per cent) in CSIR-SARI and CSIR-CRI respectively responded no that they are not aware of e-resources in the libraries. The finding shows that in total, 164 (96.47 per cent) agreed that they are aware of e-resource whilst insignificant number of respondents i.e. 6 (3.53 per cent) indicated that they are not are of e-resources.

The indications here are that there is a need for Library orientation and user education on e-resources for newly recruited research staff. Again, it also implies that those who indicated no depend largely on print materials for their information needs.

Specific E-Resource Awareness

According to Akpojotor (2016), Awareness'is knowledge about particular information and manifested through a particular behaviour. The findings of this study revealed a favourable percentage of awareness of specific electronic resources in both institutes. In total, 41 (63.08 percent) and 32 (51.61 per cent) respondents in CSIR-SARI and CSIR-CRI

respectively were aware of electronic resources. It was also revealed that 91.0% of respondents in CSIR-SARI and 45% in CSIR-CRI were aware of OPAC, 74.0% and 32% of respondents in CSIR-SARI and CSIR-CRI respectively were aware of Compendiums, 65.0% and 32% respondents in CSIR-SARI and CSIR-CRI respectively were aware of CD-ROMS whilst, 7.0% and 18% respondents in CSIR-SARI and CSIR-CRI respectively were aware of TEEAL. This shows that majority of the respondents were aware of OPAC with CD-ROM being the least. It was shown that some of the ways through which respondents became aware of electronic resources were through CSIR libraries, notices, flyers, and newsletters. Research conducted by Acheampong, et al (2020) “Investigating Awareness and usage of Electronic Resources by Research Scientists in Ghana” revealed that e-resources awareness and use are very common among research scientists. Scientists largely depend on e-resources to search, retrieve and communicate research findings making e-resources an essential part of finding reliable, timely, and relevant information. All respondents (100 %) indicated that they were aware of e-resources. This is similar to Ansari (2020), whose study shows that most of the respondents were aware of e-resources. They are aware that e-resources are available online and give innovative ways of searching according to the need for information. It provides multiple access and provides bibliographic data, abstract and full text. The findings also agreed with Subha and Natarajan (2019) who examined the awareness, availability, and usability of e-resources by the faculty members of Arts & Science Colleges in Erode District, Tamil Nadu(India). Their results showed that nearly all the users were aware of the e-resources and access to all types of e-resources.

The findings are a sharp contrast with Bayugo and Agbeko (2007) who in their study of information-seeking behaviour of health science faculty at the college of health sciences. University of Ghana, stated that "academics were unaware of the two full-text journal databases (HINARI and PERI) retrieved from the library". On sources of awareness, the research findings of this study are not in agreement with Mawuenyegah-Fiati (2010) who reported that majority of respondents 42 (43.3%) got to know of electronic resources in their course work, 25 (25.8%) got to know from their lecturers while the orientation by the Balme library received the lowest percentage with 11(11.3%).

From the responses, research staff believes that electronic resources have not been well publicised to research staff of CSIR that out of the 32 responses that were given, majority 31 representing (96.9%) of the respondents were aware of electronic resources and only 1 was not aware.”

How respondents got to know about E-resources.

The finding of this study revealed that majority of respondents indicated they got to know e-resources through notices. That the results show that notices were the highest means by which respondents got to know about electronic resources. The results show showed that 108 (27.76%) of the respondents got to know about e-resources through the library. 119 (30.59%) of the respondents got to know e-resources through Notices. 69 (17.74%) of the respondents revealed that they got to know e-resources through flyers. Also, a total of 58 (14.91) and 35 (9.00%) indicated that they got to know about e-resources through newsletters and posters respectively. Further analysis reveals majority of respondents indicated they got to know e-resources through notices.

These results are similar to Mwantimwa & Ndenji-Sichalwe (2017), their results indicate that 58 (48.7%) were informed through the institution's library website, 55 (46.2%) library staff, 25 (21%) social networks, 21 (17.6%) friends, 20 (16.8%) brochures and 17(14.3%) through seminars. Seventeen (14.3%) others cited notice-boards, four (3.4%) academic mentors, and two (1.7%) indicated staff webmail as the basis of their awareness.

The current study is also in agreement with a study done by Zibani (2017), his results show that out of 71 respondents, a total of 42 (40%), indicated that they got to know about e-resources through the library orientation, 27 (26%) respondents indicated that through the library website and 18 (17%) said they got the knowledge through friends. Furthermore, 15 (14%) respondents indicated that they got to know about e-resources through the library brochures while three (3%) indicated that they got to know about the e-resources through other means such as word of mouth.

Level of Awareness of E-resources

Level of awareness is the state of being aware of e-resources and whether or not research staff uses these e-resources for their research work. The results of this study 51 (68.92 per cent) and 70 (72.91 per cent) in CSIR-SARI and CSIR-CRI respectively indicated that their aware and uses e-resources for their research work. 18 (24.32 per cent) and (21.88 per cent) revealed they are but don't use e-resources. Lastly, 5 (6.76 per cent) and 5 (52.20 per cent) of respondents in CSIR-SARI and CSIR-CRI respectively opened they are aware but don't know how to use e-resources.

The result is similar to a study conducted by Pal (2020) on the Utilization and Awareness of Library E-resources Among the Students of National Law University and Judicial

Academy, Assam. His results revealed that 102 (70.83%) of the respondents are aware and use SUPPLIS followed by 98 (68.05%) of the respondents who are aware and use JUDIS. 88 (61.11%) of the respondents are aware and use high court websites and 76 (52.77%) are aware and use Indian Kanoon. Aware but don't use: A majority 56 (38.88%) of the respondents are aware of Indian Kanoon but they don't use it. 27 (18.75%) of the respondent don't use JUDIS but they are aware of it. Not aware: 19 (13.19%) of respondents are not aware of JUDIS followed by 12 (8.33%) of respondents who are not aware of High court websites and Indian Kanoon. The least number of respondents who are not aware of SUPPLIS.

A contrary result was obtained by " Lwoga & Sukums (2018) in their study of health sciences faculty's usage behavior of e-resources found that "in addition to Google search engine, Wikipedia and four scholarly databases and search engines, the level of awareness of other 19 scholarly databases and search engines which are either subscribed or open access resources was less than 50%. In addition to Google search engine, Wikipedia, and five scholarly databases and search engines, the self-reported usage of other 18 scholarly databases and search engines was less than 50% in the 'daily' and 'weekly' categories.

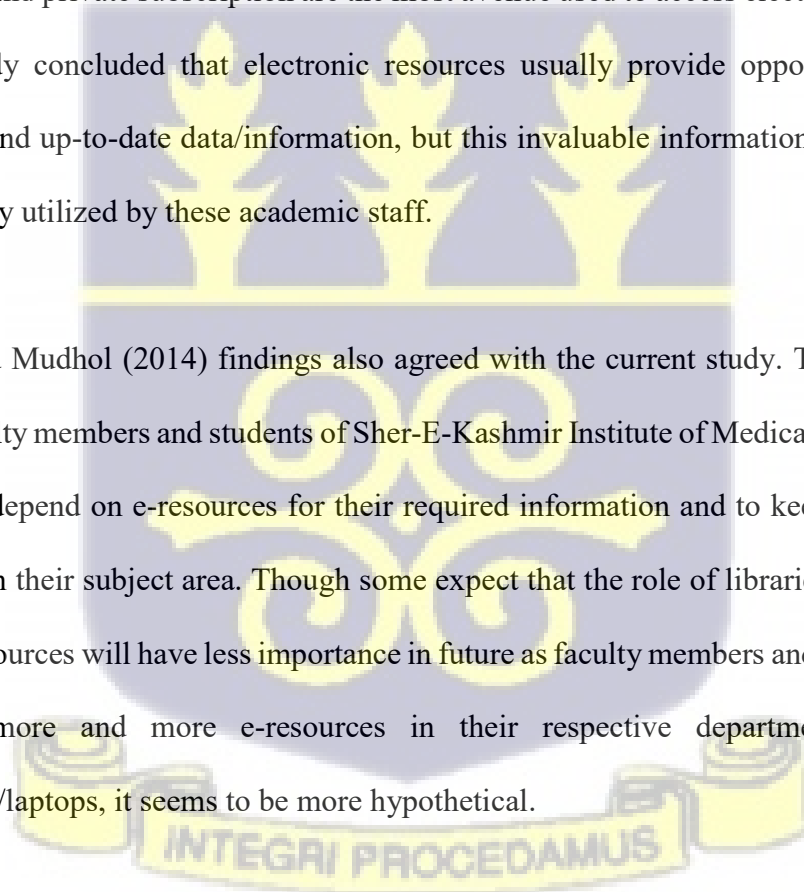
5. 4 USE AND EASE OF USE OF E-RESOURCES

Ease of use is a basic concept that describes how easily research staff can use e-resources to access the needed information. The findings revealed that majority of research staff find e-resources easy to use. Table 4.5 shows evidence from the findings that, in total 148 (87.06 per cent) respondents indicated that they find e-resources easy to use whilst, 22 (12.94 per cent) respondents disclosed that they do not find e-resources easy to use.

This research confirms the findings by Arshad and Ameen (2018) who disclose that perceived ease of searching e-databases fosters the usage of the resources in teaching, learning, and research. Other authors (such as Jeong, 2011; Donghua, 2009; Hindagolla, 2014; Donghua, 2008) have associated the use of e-resources with users' ability to use the e-resources easily (ease of use).

The findings also agreed with Tella et al. (2018) whose finding shows that majority of academic staff, University of Ilorin, Nigeria use e-resource for research, curriculum development and self-educational development. Their study also revealed that search engines and private subscription are the most avenue used to access electronic information. The study concluded that electronic resources usually provide opportunity of getting current and up-to-date data/information, but this invaluable information sources have not been fully utilized by these academic staff.

Bhat and Mudhol (2014) findings also agreed with the current study. The finding shows that faculty members and students of Sher-E-Kashmir Institute of Medical Science (SKIMS) heavily depend on e-resources for their required information and to keep themselves up-to-date in their subject area. Though some expect that the role of libraries as a gateway to the e-resources will have less importance in future as faculty members and medical students access more and more e-resources in their respective departments or personal desktops/laptops, it seems to be more hypothetical.



5.5 FREQUENCY OF USE OF ELECTRONIC RESOURCES BY RESEARCH STAFF

The fourth objective of the study was to assess the frequency of use of electronic resources by research staff. The findings of the study as indicated in table 4.4 show that a total of that 36 (48.65%) and 47(48.96%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources daily. 21(28.38%) and 26 (27.08%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources weekly. Additionally, 6 (8.11%) 21(28.38%) and 9 (9.38%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources fortnightly. 2(2.70%) and 7(7.29%) respondents from CSIR-SARI and CSIR-CRI respectively use e-resources monthly and those respondents who occasionally, use e-resources were 9 (12.16%) and 7 (7.29%) from CSIR-SARI and CSIR-CRI respectively.

In total 83 (48.82%) of the respondents uses e-resources daily. 47 (27.65%) of the respondents use e-resources weekly. 15 (8.82%) of the respondents use e-resources fortnightly. Furthermore a total of 9 (5.29%) and 16 (9.00%) indicated that they use e-resources monthly and occasionally posters respectively. This finding agreed with a study by Ankrah and Atuase (2018). Their results showed that 72(28.6%) respondents accessed e-resources on daily basis, 147(57.9%) of "respondents indicated that they use e-resources more than once a week, 45(17.9%) of them accessed them more than once a month while 36(14.3%) respondents rarely accessed them." Similarly, Patel & Darbar (2017) also in their study "Availability and Use of E-Resources by Users of CKSVIM Library, Vadodara: A Study" found that 83 (35.32%) of the respondents use e-resources daily followed by using e-resources once in week 73 (31.06%), 70 (29.79%) use 2-3 times in a week and 9 (3.83%)." Amoo (2018), revealed in his study that 32.0% of the respondents indicated daily

usage of e-resources, 18.0% of them stated that they use e-resources twice daily, 42.0% indicated weekly usage whilst 5.0% also indicated monthly usage. This shows that majority of the respondents use electronic resources available at the University library weekly. Several studies reported similar results on the frequency of use of e-resources. Thanuskodi (2012) found that maximum respondents used e-resources daily. Siwach, & Malik (2019), found that only 16.36% of users were using the e-journals daily, 33.22% used 2/3 times a week, 13.66% used once a week and 36.76% used occasionally. Nanda (2017) found that about 54.23% of research scholars and 51.78% of faculty members were accessing the e-journals on daily basis. Sethi & Panda (2012) revealed that 25% of the respondents used e-resources frequently while they were used 2-3 times in week by 25% and occasionally by 23.43%. Bhat & Mudhol (2014) in their study on the use of e-resources by faculty members and students of Sher-E-Kashmir Institute of Medical Science (SKIMS) revealed that 2-3 hours of access to the internet was quite common among the gastroenterology and general medicine faculties and students. In a comprehensive study titled "Engagement of users with e-resources across agricultural libraries of Northern India", Bhat (2018) explored the frequency at which users tend to use e-resources along with the average time invested by them per day in using e-resources. The study found that majority of the users use e-resources 'daily' and '2-3 times a week'

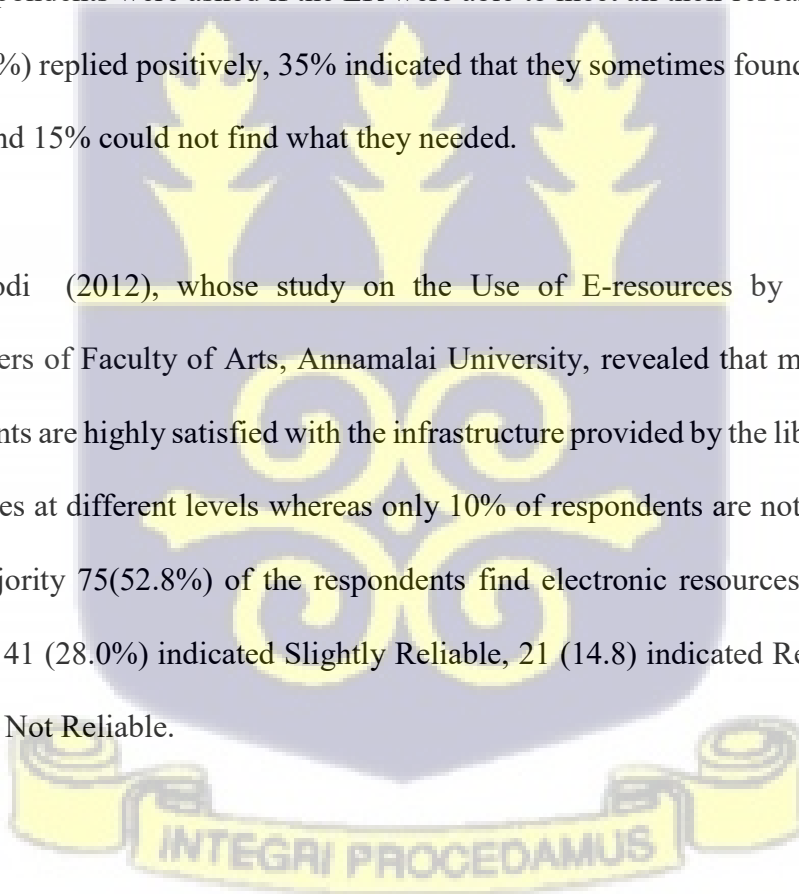
Level of satisfaction and coverage of electronic resources"

"Satisfaction is the state that results after a user has favourably or positively experienced a service or a product" (Cooper and Dempsey 1998). The findings of this study revealed that in total 25.29% of the respondents indicated they are highly satisfied with the coverage of e-resources, and 38.32% of them are satisfied. 20.58% of them indicated that they are fairly

Satisfied, and 15.29% said they are Dissatisfied. This is an indication that there is a split in the satisfaction level of electronic resources. The findings in this study are similar to Sohail & Ahmad (2017), who revealed that 28(56%) faculty members and 21(23.33%) students were 'Satisfied' 31 (62%) faculty members and 22(24.44%) students were 'Very satisfied' and 14(28%) faculty members and 5(5.55%) students were 'dissatisfied' with e-resources and services. The highest 53(37.85%) respondent are very satisfied and only 7(5%) respondents are dissatisfied with library electronic resources.

A study by Hendal (2020) also sought Users 'satisfaction with the use of e-resources, when respondents were asked if the ER were able to meet all their research needs. Half of them (50%) replied positively, 35% indicated that they sometimes found what they needed and 15% could not find what they needed.

Thanuskodi (2012), whose study on the Use of E-resources by the Students and Researchers of Faculty of Arts, Annamalai University, revealed that majority 50.56% of respondents are highly satisfied with the infrastructure provided by the library for accessing e-resources at different levels whereas only 10% of respondents are not satisfied with the same majority 75(52.8%) of the respondents find electronic resources information very Reliable. 41 (28.0%) indicated Slightly Reliable, 21 (14.8) indicated Reliable and 5 (3.5) indicated Not Reliable.



5.6 USEFULNESS OF ELECTRONIC RESOURCES TO RESEARCH STAFF

The Technology Acceptance Model shows that the usefulness of a technology is founded on the fact that it will improve the work of the users. Daramola (2016) affirms this when he that, electronic resources in academic libraries broaden the range of available information within the library and add value to the content by making them accessible through digital means.

This study supports TAM as a total of 92.94% of the respondents in both institutes "indicated that e-resources were useful to their research work. At the institutes' level, the findings show that 67 (90.54 percent) respondents in CSIR-SARI and 91(94.75 percent) respondents of CSIR-CRI respectively, indicated the e-resources were useful. Only a total of 7 (9.46 percent) and 5 (5.21 percent) respondents of CSIR-SARI and CSIR-CRI respectively indicated no to the usefulness of e-resources to their research work.

This is supported by the study conducted by Sebastian & Muthumari (2020), Their study sought to identify the impact of e-resources. 154(43.8%) respondents under study suggested that the use of e-resources has improved their learning/professional competence, 132(37.50%) indicated their dependency on e-resources and 66(18.80%) were happy with the e-resources since it has accelerated their research process. This study also agreed with Patel & Darbar (2017) on usefulness of e-resources, whose study revealed that 151(64.26 per cent) respondents have said it is highly useful, 60 (25.53%) respondents have said it is useful, 19 (8.08%) respondents have said it is less useful and very few 5 (2.13%) respondents have said it is not useful.

This study also agreed with Kwadzo (2016) on awareness and usage of electronic databases at University of Ghana, whose study revealed that 53.1% indicated that electronic resources had a great impact on academics, while 18.8% indicated little impact. Omoosejimi et al. (2015) also revealed that the use of ERs has had a tremendous impact on the academic performance of undergraduate students." Majority of the respondents 41 (50.0%) indicated that e-resources have an impact on their academics as it makes them retrieve information with ease. This was followed by 30 (36.6) who indicated that it helps to expand their knowledge-base, 7 (8.5%) believed that it makes them excel in their academics, since studying on a computer makes them sit long and 4 (4.9%) indicated that it enhances their ability to recall what they have learned easily since it is easy to visualize computer-based information. This corroborates with the findings of Acheampong (2016) who revealed that majority of 215 (39.8%) "of the respondents indicated" that "e-resources" make them retrieve information with ease and 150 (27.8%) indicated that it helps them to expand their knowledge-base. In addition, most of the respondents are comfortable using electronic resources as 86.0% indicated yes and only 14.0% indicated no. With regards to skillfulness in using electronic resources, 55.0% indicated yes and 42.0% indicated no. however only 29.0% indicated that they are skilled in formulating search queries, 47.0% indicated no and 21.0% stated that they do not know. This shows a low level of skillfulness and that training programs must be organized to provide students with the needed skill to use electronic resources effectively. A similar study by Ozoemelem (2009) revealed that 32 (41.03%) of the respondents are skilled in formulating search queries and 46 (58.97%) are not. A study by Bashorun et al. (2011) at the University found

that respondents had no ICT skills to use electronic resources and this affected the effective use of electronic resources.

5.7 CHALLENGES OF USING ELECTRONIC RESOURCES

Research staff's quest to use e-resources for their research work encounters some challenges in terms of access and usage. A number of challenges in the use of electronic resources were revealed in this study. This included; Poor internet connectivity, Power outages, Lack of perpetual access to e-resources, Lack of information on how to access E-resources, Struggle with information overload, and E-resources being too complicated to use. These challenges hinder the smooth attainment or achievement of an objective or goal of using e-resources. The findings show that the dominant challenges faced by respondents are poor internet connectivity in accessing and using the desired information. In total, 40.50 percent and 30.60 per cent respondents in CSIR-SARI and CSIR-CRI respectively face the problem of poor internet connectivity. Both respondents in CSIR-SARI and CSIR-CRI indicated poor internet connectivity as the most significant challenge hindering e-resources access and use. This finding agrees with Ternenge and Kashimana (2019) who observed that slow and poor internet connectivity was a common problem students' faced when accessing e-resources. This may serve as an obstruction to learning and research work, especially to research staff.

Furthermore, Kelefa Mwantimwa, Elia & Ndenje-Sichalwe, (2017) contends that majority (68.1%) of the respondents indicated their inability to access full-text articles was the most challenging problem. Other major challenges mentioned were slow Internet connectivity and unreliable power supply.

Additionally, 22.40 percent) and 27.90 per cent respondents of CSIR-SARI and CSIR-CRI respectively, felt difficulty in using e-resource due to power outages. Respondents in both institutes indicate these power outages as the second major challenge hindering the use of e-resources. This finding is supported by existing literature that shows power outages as challenges to the use of e-resources. Tella, Orim, Ibrahim, etc. al.(2018) asserted that the use of e-resources by academic staff is reported to be hindered by slow Internet service, lack of constant power supply, low availability of e-resources, and inadequate online access. Mwantimwa, Elia &Ndenje-Sichalwe (2017). Other challenges revealed by the research were the Lack of perpetual access to e-resources. A total of 11.60 percent respondents in CSIR-SARI and 8.90 percent respondents of CSIR-CRI respectively, opined that lack of perpetual access to e-resources hinders the use of e-resources.

This implies that they are not able to use e-resources when subscribing to a particular e-resource seized. In addition, website does not exist in perpetuity. Okogwu (2019) supported this finding when he stated that at the end of the license period if the selector decides to cancel the subscription, it results in a loss of access to the content. It is critical to check access to the resource on regular basis and follow up with the provider in the case of loss of access, which requires special staff having technical skills and knowledge. There is a lack of perpetual access to e-resources. A majority of e-resources are licensed for a limited time reiterated (yu & breivold, 2008).

Lack of information on how to access E-resources, was also identified by research staff as another challenge they faced in their use e-resources. This kind of challenge means research staff is able to maximise the use of resources because they did not have the guidelines on how a particular e-resource can be used to retrieve the needed information.

As indicated by Soni, Kapil & Shrivastava (2018) that lack of skills is a problem in accessing and searching e-resources. The finding also agreed with Ankrah & Atuase (2018).

In addition to these findings was the revelation that research staff struggles with information overload when using e-resources. This has become one of the challenges they face as e-resources users. These findings mean that research staff are unable to access relevant information given the mass of information that is presented as a possible option for their search. The finding of this study validated the opinion of Abdulrahman and Onuoha (2019) who opined that the major challenges of e-resource use were highlighted as follows; slow internet speed, difficulty in finding relevant information, overload of information on the Internet, it takes too long to view/download pages etc.

Lastly, the research reveals that E-resources being too complicated to use was another challenge research staff faced when using e-resources. The complication arises as a result of the several passwords, search terms, and links respondents have to follow to retrieve and use the desired information. This finding is in agreement with the study carried out by Okogwu (2019) on the difficulties of accessing electronic resources among postgraduate library users in university libraries in southeast Nigeria.

4.7 SUMMARY

The discussion of the various research findings of the study was treated in this chapter relative to interrelated literature. From the discussions, it was recognised that there was a positive relationship between perceived usefulness, perceived ease of use and actual usage of e-resources for research and learning in CSIR. Additionally, it was proven that research staff were aware of e-resources and use them on daily basis for their research work.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

6.1 Introduction

The chapter presents the summary of findings, conclusion and recommendations.

The objectives of the study were:

1. To compare the types of e-resources used by the research staff of CSIR-SARI and the research staff of CSIR-CRI
2. To examine the awareness of e-resources by the research staff of CSIR-SARI and CSIR-CRI
3. To examine the use and ease of use of electronic resources by research staff of CSIR-SARI and CSIR-CRI
4. To assess the frequency of use of electronic resources by Research staff of both institutes
5. To examine the usefulness of electronic resources by the research staff of both institutes.
6. To identify the challenges" associated with the use of electronic resources by the research staff of CSIR-SARI and CSIR-CRI.
7. To make recommendations based on the findings of the research.

6.2 SUMMARY OF FINDINGS

Electronic resources have demonstrated to be one of the means of searching for relevant, current and timely information by research staff of CSIR-SARI and CSIR-CRI. Indeed E-resources awareness among research staff CSIR-SARI and CSIR-CRI, are high. The study shows that e-resources awareness and use are very common among research staff. Research staff largely depend on e-resources to search, retrieve information and use for their research

work, making e-resources an essential means of finding timely, current and useful information. The use of electronic resources had also improved their research output. Nevertheless, the use of e-resources is hindered by poor internet connectivity, power outages and information overload among others.

The following are the major findings that came up from this study:

- Majority of respondents in both institutes use AGORA for their research work whilst CD-ROMS and Compendiums have been the least e-resources used.
- majority of respondents are aware of these categories e-resources and research staff of CSIR-CRI. On-line Public Access Catalogue (OPAC) is the most aware e-resources among the others.
- nearly 100% of research staff are aware of e-resources
- majority of respondents indicated they got to know e-resources through notices. That the results show that notices were the highest means by which respondents got to know about e-resources.
- majority of respondents are aware and use e-resources and research staff of CSIR-CRI are more aware. However, there a number of respondents who revealed they are aware but don't use e-resources.
- Majority of respondents felt that e-resources are well publicised to research staff of CSIR-SARI and CSIR-CRI.
- Over 90% of respondents in both institutes use e-resources for their daily research work.
- Majority of the respondents use electronic resources daily for their research activities.

- majority of research staff find e-resources easy to use.
- 79 (46.47%) of respondents forming the majority felt that there were 'very good' at using e-resources to access information.
- Majority of respondents in both institutes opined that e-resources are time-saving.
- The results show that majority of respondents in both institutes felt e-resources are useful to their research work.
- Majority of respondents in CRI felt that "they can retrieve fulltext articles with ease while majority of respondents in SARI feel e-resources are easy to manipulate, copy and transfer to content remotely to others.
- Respondents consider the various e-resources as either highly useful or useful to their research work
- The dominant challenge facing both institutes is poor internet connectivity.

6.3 CONCLUSION

Electronic resources are important to library collection in the 21st century as they are used by libraries and librarians to meet the information needs of various clientele. The use of e-resources for research work has led to many studies by several authors

According to the findings of past studies and the findings of this study, majority of research staff are aware and use e-resources for their research work. This study also found that research staff considers e-resource to be highly useful to their research work.

Moreover, the finding of the study confirmed that e-resources are easy to use and it provides timely information to users. Additionally, the research showed that the impacts of e-resources on research activities are enormous. Some of these impacts are; e-resources are easy to manipulate, copy and transfer the content of a document remotely to others. It also makes them excel in their research work since they can easily refer to and keep track of what has already been done.

In light of the above findings, the research, therefore, proposed that further research should be conducted in this area (e-resources within CSIR) to find out the impact of electronic resource use on research output in CSIR since this work only touches on the impact of e-resources to research staff.

Although e-resource use is high within CSIR, two main problems hold back optimum usage. These are poor internet connectivity and power outages.

6.4 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. It was revealed in the study that despite majority of research staff being aware of electronic Resources, there are still 1.25% of them who indicated that they are not aware of these resources. Therefore, CSIR libraries should intensify their publicity drive by constantly finding innovative ways to create research staff awareness of these electronic resources.

2. Since, Compendiums and CD-ROMS are the least electronic resource, respondents are aware off library management can organize Awareness program and training on the use of Compendiums and CD-ROM as it contains useful information that can be accessed to support research work.

3. The research revealed a significant number of research staff who got to know about Electronic resources through notices. CSIR Libraries can create awareness of e-resources by constantly placing notices of these resources on the notice boards and at vantage points. Notices can also be placed on the institutes' websites and official social media sites. Other means of creating awareness by distribution of flyers and brochures on e-resources, sending text messages to research staff on e-resources, and placing adverts in newsletters to draw research staffs' attention and make them aware of the available e-resources, should be employed.

4. It is revealed in the study that 5.29% and 9% of respondents use e-resources monthly and occasionally respectively. Due to this, the Library management should provide research staff training and instructional programs on how to use the library's electronic resources. The training programs should be structured and organized regularly to ensure that more research staff uses e-resources either daily or weekly. It should also involve training on search strategies and how to formulate terms to access each e-resources so as to make the use of e-resources easier for research staff.

5. CSIR libraries should strengthen consortium (CARLIGH) to share the cost of subscription to e-resources; and establish institutional repositories to promote remote access and use of local content materials.

6. The study revealed that the majority of the respondents specified poor internet connectivity and power outages as the main challenges they face in electronic resource usage. As a result, management of CSIR institutes should provide efficient and effective Internet connections and ensure that there is a constant supply of electricity to encourage “ensure constant use of electronic resources by research staff.

6.5 Areas for further studies

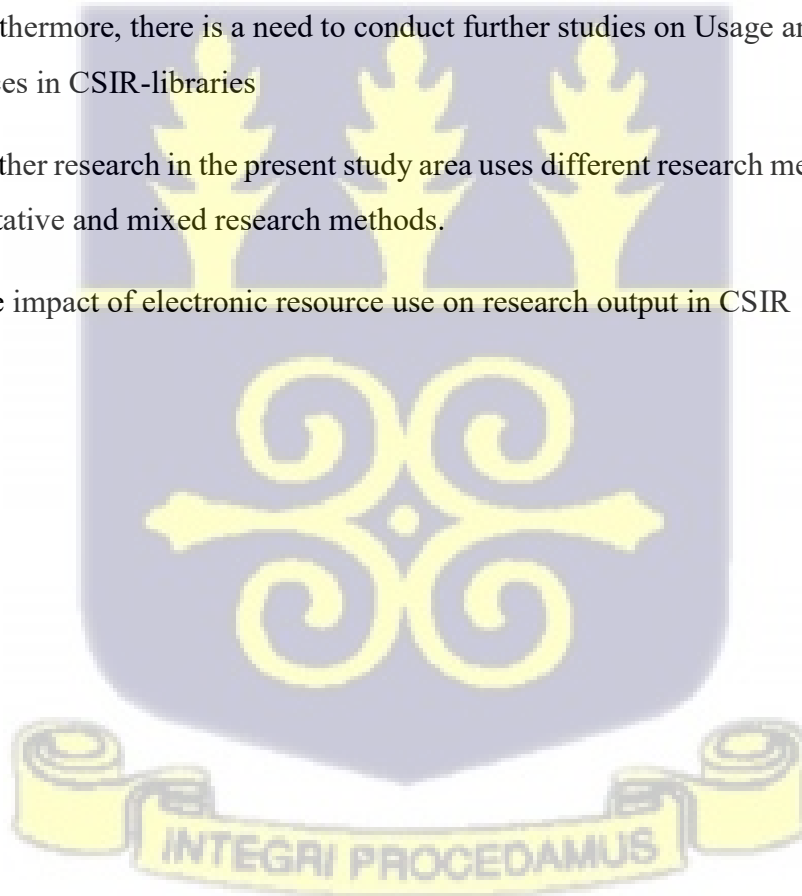
The present study was limited in scope to two research institutes (CSIR-SARI and CSIR-CRI). In view of the findings there is a need to investigate the following:

6.5.1 Further studies should be undertaken in the other thirteen CSIR research institutes

6.5.2 Furthermore, there is a need to conduct further studies on Usage and acceptability of e-resources in CSIR-libraries

6.5.3 Further research in the present study area uses different research methods for instance the qualitative and mixed research methods.

6.5.4 The impact of electronic resource use on research output in CSIR



REFERENCES:

- Abdel-Gaber D. & Abdel-Aleem Ali A, (2020), Electronic Resources as a Main Tool for Improvement of Research Output of Academic Staff: A Case Study of Princess Nourah bint Abdulrahman University. *Journal of Library and Information Sciences*, 8(1), 70-82.
- Abdulrahman, Y & Joseph,O (2019). "Challenges associated with accessing and utilizing library electronic information resources by economics education students' in south east, nigeria" *library philosophy and practice (e-journal)*. 2711. <https://digitalcommons.unl.edu/libphilprac/2>
- Acheampong, L. D., Mingle, N. A., Kofi, P. S. O., & Bekoe, S. (2020). Investigating awareness and usage of electronic resources by research scientists in Ghana. *DESIDOC Journal of Library and Information Technology*, 40(4), 204–210. <https://doi.org/10.14429/djlit.40.4.14906>
- Adegbore, A. M. (2011). University faculty use of electronic resources: a review of the recent literature. *PNLA Quarterly*, 75(4), 65–75. <https://gateway.library.qut.edu.au/login?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=lxh&AN=67047610&site=ehost-live&scope=site>
- Adeleke, D. S., & Emeahara, E. N. (2016). Relationship between Information Literacy and Use of Electronic Information Resources by Postgraduate Students of the University of Ibadan. *Library Philosophy and Practice (e-journal)*, 1381, 1-16. <http://digitalcommons.unl.edu/libphilprac/1381>
- Adom D., Kamil E., Agyem H. A. (2018) theoretical and conceptual framework: Mandatory ingredients of quality research. *International Journal of Scientific Research*. (4) 1
- Ahmed, A. and AlRiyace, S (2017). Knowledge and Use of Electronic Information Resources by Medical Students at Al-Jouf University in Saudi Arabia. *Library Philosophy & Practice*

- Akpojotor, O.J. (2016). Awareness and usage of electronic information resources among postgraduate students of library and information science in Southern Nigeria. *Library Philosophy and Practice (e-journal)*
- Akporhonor, B. A., & Akpojotor, L.O. (2016). Challenges Confronting Postgraduate Library and Information Science Student in the Use of Electronic Resources in Southern Nigeria. *Library Philosophy and Practice (e-journal)*. Paper 1319. <http://digitalcommons.unl.edu/libphilprac>
- Alzahri, J.A. (2016). Use of Electronic Information Resources by Academic Staff at Umm Al Qura University Saudi Arabia. *Majallat Al-Markaz Al-'Arabī Lil-Buḥūth Wa-Al-Dirāsāt Fī 'Ulūm Al-Maktabāt Wa-Al-Ma'lūmāt*, (.3) 6
- Ameyaw, S., Kwakye, J. O., Asante, E. (2016). Electronic Resources Usage in Private Universities: Evidence from Valley View University, Ghana. *ADRR Journal of Arts and Social Science*, 14(4), 1-15 <https://journals.adrri.org/index.php/adrri/jass/article/view/266>
- Ankrah, E. & Atuase, D. (2018). "The Use of Electronic Resources Postgraduate students of the University of Cape Coast" *Library Philosophy and Practice (e-journal)*. 1632. <https://digitalcommons.unl.edu/libphilprac/1632>
- Ansari, M. N., Zuberi, B. A. (2010). Use of Electronic Resources among Academics at the University of Karachi" (2010). *Library Philosophy and Practice (e-journal)*. 385. <https://digitalcommons.unl.edu/libphilprac/385>
- Ansari, M. S. (2020). "Use and Awareness of E-resources among Research Scholars of Literature Subjects in Banaras Hindu University" *Library Philosophy and Practice (e-journal)*. 4667. <https://digitalcommons.unl.edu/libphilprac/4667>
- Anyim, W. O. (2018). E-Library Resources and Services: Improvement and Innovation of Access and Retrieval for Effective Research Activities in University E-libraries in Kogi State Nigeria. *Library Philosophy and Practice*. <https://digitalcommons.unl.edu/libphilprac/1647>

Amina, A. B., & Lucky, A. O. (2016). Challenges confronting postgraduate library and information science student in the use of electronic resources in southern Nigeria. *Library Philosophy and Practice*. <https://link.gale.com/apps/doc/A449417578/AONE?u=anon~d14f8ebb&sid=googleScholar&xid=dddc3b34>

Amoo H. O. (2018). The use of electronic resources by “graduate "students of the University of Ghana. *This Dissertation is submitted to the “University Of Ghana, Legon,*

Asom F., Suleiman, M. & Kudus D. (2018). Impact of Awareness and Accessibility of Electronic Information Resources in University Libraries on Research by Postgraduate Students of Federal University of Agriculture Makurdi and Federal University of Technology Minna Nigeria. *British Journal of Education, Learning and Development Psychology* 1 (1) 1-10

Arkkelin, D. (2014). Using SPSS to Understand Research and Data Analysis. *Psychology Curricular Materials 2014*, 194. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.139.2050&rep=rep1&type=pdf>

Arshad, A. & Ameen, K. (2018). Usefulness of e-journals consortium in Pakistan: Academic staff's perceptions and expectations. *Serials Review*. <https://doi1080/00987913.2018>.

Babbies, E.R. 2013. The practice of social research. *Wadsworth Cengage Learning*.

Babu, K. M. (1945). Utilization of Electronic Information Resources and Services by the Students in the Engineering Colleges Bangalore City – A Study. *Journal of Interdisciplinary Cycle Research*. XII(1076), 1076–1091

Bhat, I., & Mudhol, M. V. (2014). Use of E-resources by Faculty Members and Students of Sher-E-Kashmir Institute of Medical Science (SKIMS). *DESIDOC Journal of Library & Information Technology*, 34(1).

Bamigboye, O. B. , Odunlade, R. O., Agboola, I.O. & Emmanuel, S.O.(2018), Electronic Resources as a Panacea for Research Output of Academic Staff: A Case Study of Nigerian University. *Journal of Library and Information Sciences*, 6(1), pp. 32-36
DOI: 10.15640/jlis.v6n1a5
URL: <https://doi.org/10.15640/jlis.v6n1a5>

Bankole, O. (2013). The use of internet services and resources by scientists at Olabisi Onabanjo University, Ago Iwoye, Nigeria. Program: *electronic library & information systems*. 47. 10.1108/00330331211296295.

Bamigboye, D., Bamidele, O., Odunlade, D., Opeyemi, R., Idayat Odunola, A., & Sunday Oluwafemi, E. (2018). Electronic Resources as a Panacea for Research Output of Academic Staff: A Case Study of Nigerian University. *Journal of Library and Information Sciences*, 6(1). <https://doi.org/10.15640/jlis.v6n1a5>

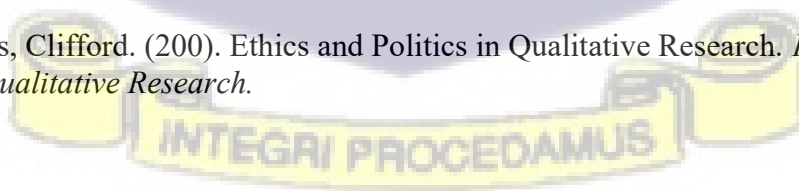
Bhat, Nazir. (2017). Engagement of users with e-resources across agricultural libraries of Northern India. *Library Management*. 39. 00-00. 10.1108/LM-04-2017-0039.

Bhat, I. & Mudhol, M. (2014). Use of E-resources by Faculty Members and Students of SherE-Kashmir Institute of Medical Science (SKIMS). *DESIDOC Journal of Library & Information Technology*. 34. 28-34.

Bihari Sethi, B, and Panda, K. C., (2012) Use of E-Resources by Life Scientists: A Case Study of Sambalpur University, India). *Library Philosophy and Practice (e-journal)*. 681. <https://digitalcommons.unl.edu/libphilprac/681>

Burhansab, P. A., Batcha, M.S., and Ahmad, M. (2020). "Investigating Awareness and usage of Electronic Resources by the Library Users of Selected Colleges of Solapur University" *Library Philosophy and Practice (e-journal)*. <https://digitalcommons.unl.edu/libphilprac/4309>

Christians, Clifford. (200). Ethics and Politics in Qualitative Research. *Handbook of Qualitative Research*.



Connaway, L. S. & Powell, R. R. (2010). *Basic research methods for librarians (5th ed.)*. Santa Barbara: Libraries Unlimited.

Cooper, R. & Dempsey, P.R. (1998). Remote library users—needs and expectations. *Library Trends*, 47(1), 42 - 64.

Dadzie, P.S.. (2005). Electronic resources: Access and usage at Ashesi University College. *Campus-Wide Information Systems*. 22. 290-297.
10.1108/10650740510632208.

Daniel, J. (2015). Sampling: the foundation of good research. In *Public health research methods* (pp. 511-552). SAGE Publications, Inc.,
<https://www.doi.org/10.4135/9781483398839>

Daramola, C. F. (2016). Perception and Utilization of Electronic Resources by Undergraduate Students: The Case of the Federal University of Technology Library, Akure. *American Journal of Educational Research*, (4)5, 366-370
<http://pubs.sciepub.com/education/4/5/1>

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319. <http://dx.doi.org/10.2307/249008>

Dayakar, G.. (2018). Use of E-Resources in higher education: Advantages and Concerns. *Journal of Applied and Advanced Research*. 2. 17. 10.21839/jaar.2018.v3iS1.160.

Denzin NK, Lincoln YS. (2013) Chapter 1: Introduction: *The Discipline and Practice of Qualitative Research*. Landsc Res. Published online.

Donghua, T. (2008). Understanding intention to use e-information resources: a Theoretical extension of the technology acceptance model. AMIA Annual Symposium Proceedings Archive, pp. 717-721.

Donghua, T. (2009). Intention to use and actual use of e-information resources further Exploring TAM. AMIA Annual Symposium Proceedings Archive, pp. 629-633

- Egberongbe, H. S. (2011). The use and impact of electronic resources at the University of Lagos. *Library Philosophy and Practice (e-journal)*, 472
- Eiriemiokhale K. A. (2020). Frequency of Use and Awareness of Electronic Databases by University Lecturers in South-west, Nigeria. *Library Philosophy and Practice (e-journal)*
- Fleming, J. & Zegwaard, K. (2018). Methodologies, methods and ethical considerations for conducting research in work-integrated learning. *International Journal of Work-Integrated Learning*. 19. 205-213.
- Fraenkel, I.R. & Wallen, N.E. (2012). *How to Design and Evaluate Research in Education* 5th ed. New York: McGraw-Hill
https://saochhengpheng.files.wordpress.com/2017/03/jack_fraenkel_norman_wallen_helen_hyun-how_to_design_and_evaluate_research_in_education_8th_edition_-mcgraw-hill_humanities_social_sciences_languages2011.pdf
- Folitse, B. Y.; Osei, S. K.; Dzandu, L. P.; Obeng-Koranteng, G. (2017). A study on the agricultural research scientists' Knowledge in the use of internet resources. *CSIRSpace Ghana*.
<http://hdl.handle.net/123456789/256>
- Franklina A.Y. & Florence D. D. P. (2017). Awareness and Use of Electronic Resources in University Libraries: A Case Study of University for Development Studies Library. *Library Philosophy & Practice (e-journal)*
- Gupta, S. (2017). E-ShodhSindhu consortium: awareness and use". *SRELS Journal of Information Management*, vol. 54, no.2, pp. 91-99
DOI: 10.17821/srels/2017/v54i2/109142
- Hamed Taherdoost, H (2016). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *International Journal of Academic Research in Management (IJARM)*, 5.hal-02546796
- Hendal B.A. (2020) Kuwait University faculty's use of electronic resources during the COVID-19 pandemic. *Digital Library Perspectives* (36) 4 pp. 429-439
DOI 10.1108/DLP-04-2020-0023

- Hiller, S., (2002). How different are they? A comparison by academic area of library use, priorities, and information needs at the University of Washington. *Issues in Science and Technology Librarianship*.
<http://www.istl.org/istl/02-winter/article1.html>.
- Hindagolla, M. (2014). Understanding user acceptance of e-information resources: effects of content relevance and perceived abilities. *Modern Society and Culture*, vol. 59, no.12, pp.239-255.
- Ho, L.H.S. (2020), "Are library electronic resources providing adequate support for research? A case study of a federal university in the United Arab Emirates", *Collection and Curation*, 39(1), pp. 15-21.
<https://doi.org/10.1108/CC-02-2019-0003>
- Isah, A., & Bwalya, K. J. (2014). The adoption and Usage of Digital Library Resources by Academic Staff in Nigerian Universities : A Case Study of University of Ilorin. *Digital Libraries 2014, Doctoral C.*
- Joel A. P. (2020). Awareness and Purpose of Electronic Information Resources among Postgraduate Students of Library and Information Science in Borno State East African Scholars Journal of Education, Humanities and Literature 3 (8), 362-366
- Jeong, H. (2011). An investigation of user perceptions and behavioral intentions towards the e-library. *Library Collections, Acquisitions and Technical Services*, vol. 35, pp. 45-60
- Kavithanjali, J. (2019). E – Resources: Their Importance, Types, Issues and Challenges: An Analysis. *IJRAR- International Journal of Research and Analytical Reviews*, 6(1), 775-778.
- Kumar, S and Singh, M. (2011). “Access and use of electronic information resources by scientists of National Physical laboratory in India: A case study”, *Singapore Journal of library and information management*. (40)33-49. pp.34.
- Kothari C. R. (2004). *Research Methodology Methods and Techniques, (second edition)*. New Age International (P) Ltd., Publishers
<http://dl.saintgits.org/jspui/bitstream/123456789/1133/1/Research%20Methodology%20C%20R%20Kothari%20%28Eng%29%201.81%20MB.pdf>

- Kwadzo, G. (2015). Awareness And Usage Of Electronic Databases By Geography And Resource Development Information Studies Graduate Students In The University Of Ghana. *Library Philosophy and Practice (e-journal)*
- Lucky, U. H. (2012). Use of Electronic Resources and its Impact: A Study of Dhaka University Library Users. *Eastern Librarian*. 23. 74-90.
10.3329/el.v23i1.12122.
- Lwoga, E. L., & Sukums, F. (2018). Health sciences faculty usage behaviour of electronic resources and their information literacy practices. *Global Knowledge, Memory and Communication*, 67(1/2), 2-18. doi:10.1108/GKMC-06-2017-0054
- Madhusudhan M. (2010). Use of electronic resources by research scholars of Kurukshetra University. *The Electronic Library*. 28. 492-506.
10.1108/02640471011033684
- Madondo, T., Sithole, N., & Chisita, C. (2017). Use of Electronic Information Resources by Undergraduate Students in the Faculty of Management and Administration at Africa University, Mutare, Zimbabwe. *Asian Research Journal of Arts & Social Sciences*, 2(2),1-12
<https://doi.org/10.9734/arjass/2017/29633>
- Manjack F.U., Dangani,B.U., Fari, S.A. (2019), & utilization of electronic information resources by undergraduate students in university libraries in Gombe state, Nigeria
- Mwantimwa, K., Mwabungulu, E. & Kassim, M. (2021). Academic Staff and Researchers' Use of Electronic Resources in Tanzania: A Comparative Study. *The International Journal of Education and Development using Information and Communication Technology*. 17. 55-75.
- Mwantimwa K., Elia E. & Ndenje-Sichalwe, E (2017), Utilisation of E-Resources to Support Teaching and Research in Higher Learning Institutions, Tanzania. *University of Dar es Salaam Library Journal* (12) 2 pp-98-123

- Mahapatra, R. K. (2017). Use of e-Resources among Social Scientists in Selected Institutes in Bhubaneswar: A study. *International Journal of Information Dissemination and Technology*, 7(2), 102-106
- Manda, P., & Nawe, J. (2008). Impact of the Use of Electronic Resources on Research Output.
- Nanda, A. (2017). Use and awareness of e-journals by the faculty and research scholars of Veer Surendra Sai University of Technology: A study. *DESIDOC Journal of Library & Information Technology*, 37(4), 274-280. doi:10.14429/djlit.37.4.10871
- Navin K. S., Kapil K. G. & Jitendra S. (2018). Awareness and Usage of Electronic Resources among LIS Scholars of Jiwaji University, Gwalior : A Survey. *Journal of Library & Information Technology*, (38). 1
- Nie, N., Dale, B. & Hadlai, H.C. (1970). *SPSS: Statistical Package for the social sciences*. New York: McGraw-Hill 7
- Neuman, W. L. (2014). *Social research methods: qualitative and quantitative approaches (7th ed)*. Harlow: Pearson Education Limited.
http://letrunghieutvu.yolasite.com/resources/w-lawrence-neuman-social-research-methods_-qualitative-and-quantitative-approaches-pearson-education-limited-2013.pdf
- Ngeme F. & Adesina A. S. (2021), Accessibility and Usage of Electronic Information Resource on Research Output of Librarians in Ekiti, Ondo and Osun States (2010 – 2015). *creativecommons*.
<https://creativecommons.org/licenses/by-nc/4.0> (the “License”)
- Obeng-Koranteng, G. & Dzandu, M. (2013). Evaluation of the Use of Electronic Resources by Agricultural Research Scientist In Ghana: A Study of the Food Research Institute and Animal Research Institute. *UGSpace*
<http://197.255.68.203/handle/123456789/7689>

- Okite-Amughoru, F., Bopape S., & Makgahlela, L. (2015). Challenges of using electronic information resources for academic research by postgraduate students at Delta State University, Abraka, Nigeria. *African Journal Published Online*: (33) 4
- Okogwu, F. I, (2019). "difficulties of accessing electronic resources among postgraduate library users in university libraries in southeast nigeria. library philosophy and practice (e-journal). 2425. <https://digitalcommons.unl.edu/libphilprac/2425>
- Okoli, C., & Schabram, K. (2010). Working Papers on Information Systems A Guide to Conducting a Systematic Literature Review of Information Systems Research. *Working Papers on Information Systems*, 10(2010). <https://doi.org/10.2139/ssrn.1954824>
- Olusola B. Dr B. & Sunday E. (2018). "Electronic Resources as a Panacea for Research Output of Academic Staff: A Case Study of Nigerian University", *Journal of Library and Information Sciences* Volume 6, Number 1, pp. 32-36
- Omosekejimi, A.F., Eghworo, O.R. and Ogo, E.P. (2015), "Usage of electronic information resources (EIRs) by undergraduate students of Federal University of Petroleum Resources Effurun", *Information and Knowledge Management Journal*, (5) 4, pp. 94-103.
- Pal, N. (2017), Utilization and Awareness of Library E-resources Among the Students of National Law University and Judicial Academy, Assam: A Study. *Redesigning and Reimagining Libraries in New Technological Era*
- Patel M.K.& Darbar M. (2017), Availability and Use of E-Resources by Users of CKSVIM Library, Vadodara: A Study, *International Research: Journal of Library & Information Science* 7 (4)
- Qasim, J., & Khan, A. M. (2015). Awareness and use of e-journals by the scientists of CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi, and Indian Institute of Chemical Biology (IICB), Kolkata, India: A comparative study. *Library Philosophy and Practice*, 0_1. <http://digitalcommons.unl.edu/libphilprac/1202>

- Ramamani B. (2017). Use of E-Resources by Faculty and Research Scholars of speech and hearing Institutions in India: A study. *International Journal of Research in Library Science* (3) 1, 162-176
- Ram G. G. & Amit K. T. (2012), Utilization of Electronic-resources by the postgraduate students, research scholars and faculty members of Indian Institute of Technology, Kharagpur” *J Scientometric Res.* Vol 3 (2) pp76-81.
- Ranganadham S. (2017), Use of Electronic Resources of Sree Vidyanikethan Engineering College, A. Rangampeta, Tirupathi: A Survey. *International Journal of Library and Information Studies* V.7(2)
- Reitz, J. M. (2014) *Online Dictionary for Library and Information Science.* Santa Barbara. Libraries Unlimited.
https://www.abc-clio.com/ODLIS/odlis_A.aspx
- Sabouri, M.S., Shamsaii, A.H., Sinaki, J.M., and Aboueye, F. (2010). Use of Electronic Resource by Users in the Faculty of Agriculture, Islamic Azad University. *Middle-East Journal of Scientific Research*, 6(5), 490-499
- Salah, A, & Samea L. S, (2020). The Opportunities and Challenges of Using Electronic Information Resources in Higher Education Teaching and Learning: A Case Study.” *International Journal of Arts, Science and Humanities*, (7) 4,
DOI: <https://doi.org/10.34293/sijash.v7i4.2283>
- Sami L. K, Uppal G. (2016). Awareness and use of electronic information resources in the research institute libraries of Mohali, Punjab. *Journal of Library, Information and Communication Technology*, 8(1-2), 1-7.
- Santhi, K. M. (2020) Use of Electronic Resources in Indian Academic Institutions. *Journal of Xi'an University of Architecture & Technology*, (XII) IV.
- Santhi, K. M. & Gopalakrishnan, S. 2016. “Use of electronic resources in VIT University: An empirical study”. *International Journal of Research in Library Science*, (2) 2, pp. 44 – 54.

- Sebastian, R. and Muthumari, P. (2020). Impact and Usefulness of E-resources on Delivering Knowledge in Contemporary Learning Environments of Medical Colleges in Kerala: A Study *Library Philosophy and Practice (e-journal)*. 3931. <https://digitalcommons.unl.edu/libphilprac/393>
- Sharon J., Ole G.E., Julia G., Glenda L., Lynn S., & Nadia Z. (2012). Key Issues for E-Resource Collection Development: A Guide for Libraries. *IFLA - International Federation of Library Associations and Institutions*.
- Sethi, B. B. & Panda, K. (2012). Use of E-Resources by Life Scientists: A Case Study of Sambalpur University, India. *Library Philosophy and Practice*.
- Shashikala, H. M; & Srinivasaragavan, S. (2019). Usage of E-Resources by the Faculty Members and PG Students of Kempegowda Institute of Medical Sciences Hospital and Research Centre (KIMS), Bangalore, Karnataka: A Study. *Asian Journal of Information Science & Technology (AJIST)* (9) 2, p81-86. 6p.
- Sivakami, N., & Rajendran, N. (2019). Awareness, Access and Usage of E-resources among Faculty Members in Arts and Science Colleges. *Library Philosophy and Practice*, 1-9
- Sohail, M. & Ahmad, S.. (2017). Use of Electronic Resources and Services by Faculty Members and Students of Fiji National University. *DESIDOC Journal of Library & Information Technology*. 37. 165-171.
- Soni N., Kapil G. & Shrivastava J. (2018). Awareness and Usage of Electronic Resources among LIS Scholars of Jiwaji University, Gwalior : A Survey. *DESIDOC Journal of Library and Information Technology*. 38. 56-62. 10.14429/djlit.38.1.11524
- Subha, S., Natarajan, N. O. (2019). Utilization and Impact of Electronic Information Resources among the Faculty Members of Arts & Science Colleges in Erode District, Tamil Nadu: A Case Study. *Asian Journal of Information Science & (AJIST)*, 9(1), 38-42.
- Siwach, A. & Malik, S. (2019). Use of Electronic Resources by Science Faculty and Researchers in Selected North Indian Universities. *Library Philosophy and Practice*.

- Sohail, M. & Alvi, A. (2014). Use of Web Resources by Medical Science Students of Aligarh Muslim University. *DESIDOC Journal of Library & Information Technology*. 34. 125-130. [10.14429/djlit.34.4006](https://doi.org/10.14429/djlit.34.4006).
- Sohail M. & Ahmad S. (2017). Use of Electronic Resources and Services by Faculty Members and Students of Fiji National University. *DESIDOC Journal of Library & Information Technology*, (37) 3
- Taherdoost, Hamed. (2016). Sampling Methods in Research Methodology; How to Choose A Sampling Technique for Research. *International Journal of Academic Research in Management*. 5. 18-27.
- Tella, A., Orim, F., Ibrahim, D.M. et a (2018). The use of electronic resources by Academic staff at The University of Ilorin, Nigeria. *Educ Inf Technol* 23, . <https://doi.org/10.1007/s10639-017-9577-2>
- Thanuskodi, S. (2012). Use of E-resources by the Students and Researchers of Faculty of Arts, Annamalai University. *International Journal of Library Science*, 1(1), 1–7. <https://doi.org/10.5923/j.library.20120101.01>
- Velmurugan, Senthur. (2019). e- resources. https://www.researchgate.net/publication/337242694_e-resources/citation/download
- Tella, A., Orim, F., Ibrahim, D.M. (2018). The use of electronic resources by academic staff at The University of Ilorin, Nigeria. *Educ Inf Technol* 23, 9–27 <https://doi.org/10.1007/s10639-017-9577-2>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- Ternenge, T. S., & Kashimana, F. (2019). Availability, Accessibility, and Use of Electronic Information Resources for Research by Students in Francis Sulemanu Idachaba Library University of Agriculture, Makurdi. *Library philosophy and practice (e journal)*, 1-40. 2352 <https://digitalcommons.unl.edu/libphilprac/2352>

- Waghmode, D., Laxman, M., Ara Shaikh, D. A., & Shukla, D. (2021). An Exploratory Study on Motives And Use Of Electronic Resources By Graduate Students In Navi Mumbai. *Journal of Contemporary Issues in Business and Government*, 27(2), 4823-4829.
- Welman, C. Kruger, F. & Mitchell, B. (2005). *Research methodology: Oxford University Press*
- Siwach, A. K., & Malik, S. K. (2019). Use of Electronic Resources by Science Faculty and Researchers in Selected North Indian Universities. *Library Philosophy and Practice*, NA
<https://link.gale.com/apps/doc/A622150283/AONE?u=anon~13a28665&sid=googleScholar&xid=002f35aa>
- Yu, H & Breivold, S. (2008). *Electronic resource management in libraries: Research and practice*. New York: Information Science Reference.
https://orgmonkey.net/publications/kennedy%20chapter_yu%20book%5B1%5D.pdf
- Zibani P. (2017), *Marketing of electronic resources as a tool for information service delivery and access at the university of Zululand. (Master's Thesis) dissertation submitted in partial fulfillment of the requirements for the award of degree of masters in information science at the university of zululand*
- Okogwu, F. (2019). Difficulties of accessing electronic resources among postgraduate library users in university libraries in Southeast Nigeria. *Library Philosophy and Practice*. <https://hdl.handle.net/10520/EJC185822>



APPENDIX A

Dear Colleagues,

This questionnaire seeks to elicit information from the research staff of CSIR on the use of electronic resources (e-resources), as part of a Master of Philosophy Degree Programme.

Please be assured that your responses to the questions would be kept confidential and would be used solely for academic purposes.

Your co-operation is fully appreciated.

Thank you.

Yours faithfully,

Issah Issifu



QUESTIONNAIRE

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender: Male Female

2. Name of the institute:.....

3. Division/Section /group etc.:

4. What is your rank?

Chief Research Scientist Principal Research Scientist Senior

Research Scientist Research Scientist Principal Technologies

Others (please specify)

SECTION B: AWARENESS OF ELECTRONIC RESOURCES

5. Are you aware of electronic resources?

Yes No

6. .If yes, which of the following electronic resources are you aware of? (Please tick as many as applicable)

a) . CD ROMS b). Compendiums c). Online Public Access

Catalogue (OPAC) d). Academic Databases

Others specify:.....

7. How did you get to know about these electronic resources? (Please tick as many as applicable) Through:

the library Notices flyers Newsletters Posters

Others (please specify)

8. What is your level of awareness of e-resources?

a). Aware & Using b). Aware but not using c). Aware but don't know how to use

9. Have e-resources been well-publicized to researchers of CSIR?

Yes No

10. If No, what should be done?

.....
.....

SECTION C: USE OF E-RESOURCES

11. Do you use electronic resources in your daily activity?

Yes No

12. On average, how frequently do you use electronic resources?

a) Daily b) Weekly c). Fortnightly d). Monthly
e). Occasionally

13. which of the following electronic resources do you use regularly (tick as many as Applicable)

a) AGORA b). OARE c). JSTOR d). SCOPUS

e). SCIENCEDIRECT f). Bank Publications g). SAGE Journals

h). EMERALD i). BRITANNICA ONLINE j). ResearchGate

k). EBSCO Journal Service l). CD-ROMS (CAB ABSTRACT, FAO,

INASP, AGROMISA, CTA, etc.) m). Compendiums n). TEEAL

Others (please specify).....

14. Do you find e-resources easy to use?

Yes No

15. How would you rate your level of competence using e-resources for literature search?

a). Excellent b). Very good c). Good d). Fair

e). Poor f). Don't know

16. Why do you prefer the use of e-resource to print?

a). It is Time

Saving

b). More Useful

c) It is Easy to Use

d). I can retrieve current information



4. SECTION D: USEFULNESS OF E-RESOURCES

17. Does the use of e-resources have any usefulness to your research work?

Yes No

18. If yes, what impact does it have on your research work? (tick as many as

Applicable).

a). It makes me retrieve full-text articles with ease

b). It helps me to know what others have published in my field of work

c). It makes me excel in my research work since I can easily refer and keep track of what have already been done.

d). It improves my ability to write and publish my research output.

e). It easy to manipulate, copy and transfer the content to a remotely others

19. How will you rate the usefulness of electronic resources to your research work?

a). High useful b). Somehow useful c). Little useful d). Not useful

e). Don't know



20. Rate the following e-resources according to their usefulness to your research work

E-resource	High useful	somehow useful	little useful	Not useful	Don't know
AGORA					
OARE					
JSTOR					
SCOPUS,					
SCIENCEDIRECT					
World Bank publications					
SAGE Journals					
EMERALD,					
BRITANNICA ONLINE					
Research gate					
EBSCO Journal Service					
CD-ROMS (FAO, INASP, AGROMISA, CTA, etc.), Compendiums					
TEEAL					

21. How would you rate the level of satisfaction and coverage of Electronic resources in CSIR libraries

-
- a) Very satisfied b). Satisfactory c). Fairly satisfied
- d.) Unsatisfactory

6. SECTION E: CHALLENGES

22. Which of these challenges do you face when using electronic resources? (Please tick as many as applicable)

- a) Poor internet connectivity
- b) Power outage
- c) Lack of perpetual access to e-resources
- d) Lack of information on how to access E-resources
- e) Struggle with information overload
- f) E-resources are too complicated to use

23. If you wish to make any additional comments on any section of the study, please use this space:

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Thank you very much for taking the time to complete the questionnaire. May God bless you.

