

## **Awareness and utilisation of digital resources among postgraduate students in selected universities in North-Central, Nigeria**

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### **Abstract**

This study investigated awareness and utilization of digital resources among postgraduate students of selected universities in North-Central Nigeria. A total of 92 participants who were registered library users took part in the study. Their mean age was 31.69years (SD=6.54years). Fifty-three (57.6%) were male while 39 (42.4%) were female. A 35-item structured questionnaire tagged "Awareness and Utilization of Digital Resources Questionnaire" (AUDRRQ) was used to collect data from participants who were sampled from the universities using the random sampling technique. Findings showed that participants were very much aware of availability of web-based resources (Google, yahoo, and Alta Vista search engines) but less so of other digital resources including full- text articles, bibliographies, data base and Open Access Resources. Further findings revealed that the most utilized digital resources include data bases, books, catalogues and journals. Also, it was found that the internet was the most frequently used digital resource on a daily basis. The problems encountered in the use of the digital resources by the participants were slow internet speed, lack of access to full-text articles, physical inconveniences, lack of online resources in related topics, unorganized environment and difficulty to read through screen. The results of the three hypotheses revealed that; there is a significant positive relationship between awareness and utilization of digital resources; there are significant problems associated with accessing digital resources and there is a significant negative relationship between utilization and problems of accessing these resources by the participants. It was concluded that postgraduate students investigated are aware and utilize some but not all digital resources to a significant level and that they encounter significant problems in accessing the digital resources. It recommended that university libraries be better funded to enable them provide better resources and services that will enhance awareness and usage of digital resources in their libraries.

**Keywords:** Awareness, utilization, digital resources, postgraduate students, universities, North-Central, Nigeria

### **Introduction**

In the recent years, libraries have become both more sophisticated and more dependent on new technologies for their services. For example, libraries migrated from card catalogues to online catalogues (Michael & Henkeline, 2023). With so many changes in the profession, service delivery and the demands of users have also changed. Today, librarians not only render services to patrons at the reference and circulation desk but also in cyberspace. This new type of service is called digital or virtual service, the emergence of which is as the result of culminating factors, including the advent and wide use of the internet and the development of software capable of providing synchronous and asynchronous

service (Marke & Waziri, 2023). Digital/virtual reference is quite new, but has quickly become popular because of demands by patrons to access information anytime anywhere.

Traditionally, reference service is most often referred to as reference and information services, which is the rendering of personal assistance to users in the pursuit of information (Uzoigwe & Eze, 2018). Provision of such personalized information services has remained the central theme of the library and information profession. The importance of these services grew over time with the introduction of new technologies and services in libraries and information dissemination.

Advances in information technologies have rapidly evolved the role of libraries and librarians. As a result, libraries face new challenges, competitors, demands and expectations. Mamoh (2020); Ademodi (2011); Idris, Orji and Abana (2011) asserted that, libraries are redesigning services and information products for value added service delivery to satisfy the changing information needs of the user community. The World Wide Web (WWW), viewed as an educational resource, however, exhibits some deficiencies that cannot be ignored. According to Samuilla and Barui (2023), these deficiencies include, uneven and erratic coverage, transience and unpredictability (one is not sure this piece of information will still be there tomorrow), and manifest dangers (students may encounter inappropriate information). But worst of the tragedy is that whole segments of society become disenfranchised. While most families and homes in developed countries have some degree of access to the Internet, only a fraction of citizens in the developing world can tap this wealth of information.

Digital reference service addresses these problems by providing reliable sources of appropriate material. They empower according to Rubia, Arif, Sidra and Haroon (2017), educators to create collections specifically for their students, collections with diverse forms of information from different sources. They permit alternative means of distribution (e.g., CD-ROM/DVD). The powerful technologies employed for retrieval efficiency according to Thorpe (2017) have enabled library/information centers to create multimedia information databases which provide easy retrieval and access with personal computer connected to the network. This has led to the concept of digital library and consequently digital reference service. In digital libraries, Oguniyi, Efosa and Sheji (2013) are of the opinion that the question of loss of

documents is overruled while the searching of information is effective and efficient due to global indexing and search engines.

### **Statement of the problem**

Traditional libraries are still handling large print materials that are expensive and bulky. On the contrary, information seekers are no longer satisfied with only print materials. They want to supplement the print information with more dynamic digital resources. This demand is particularly very high among postgraduate researchers who need such resources for their dissertations and theses. However, research has shown that, many of them lack the skills and techniques to access such digital resources and services from the Internet. Although, digital services are available in most modern libraries today due to availability and use of diverse information technologies Muhammad (2021), with competent librarians for effective service delivery to clientele/patrons (Ademodi, 2011; Idris, Orji & Abana, 2011) many researchers seem to be unaware of these resources. Their lack of awareness tends to low utilizations of the digital reference resources available in university libraries. This scenario leads to increased demand for digital information resources. The rise of the Internet, especially broad band connections, Olubiyo and Jamagha (2022), averred the spread of mobile connectivity have potentially affected people's use of libraries. This study sets out to investigate the awareness and utilization of digital reference resources by postgraduate students in university libraries North-central, Nigeria.

### **Purpose of the study**

Generally, the purpose of the study is to investigate the awareness and utilization of digital reference resources among postgraduate students in selected

universities, North-Central Nigeria. Specifically, the study set out to:

1. evaluate the level of awareness of availability of digital resources in these university libraries by postgraduate students;
2. examine the digital resources utilized by postgraduate students for research in these university libraries;
3. ascertain the frequency of use of digital resources by postgraduate students in these university libraries; and
4. find out the problems associated with the use of digital resources by postgraduate students in these university libraries.

### Research questions

The following questions are answered in this study:

1. What is the level of awareness of availability of digital resources by postgraduate students in universities North-Central Nigeria?
2. What are the digital resources utilized by postgraduate students for research in these libraries?
3. What is the frequency of use of digital resources by postgraduate students in these libraries?
4. What are the problems associated with the use of digital resources by postgraduate students in these libraries?

### Hypotheses

The following hypotheses are tested in this study:

1. There is no significant relationship between awareness and frequency of use of digital resources among postgraduate students of federal universities in North-Central Nigeria.
2. There are no significant problems associated with use of digital resources by postgraduate students

in university libraries in North-Central Nigeria.

3. There is no significant relationship between frequency of use of digital resources and the problems associated with use of e-resources by postgraduate students in universities in North-Central Nigeria.

### Literature review

This section undertakes the review of literature on awareness and utilization of digital reference resources by users of university libraries. In this study, focus is on postgraduate student users of the digital resources. Togia and Tsigilis (2010) investigated awareness and use of electric information resources by education graduate student of Aristotle University of Thessaloniki, Greece. Data was collected by the use of the questionnaire, On training, the study results indicated that participants showed preference for seminars run by the instruction service. One major drawback of this study was lack of clear findings on participants' awareness of digital resources, and sequent lack of this findings linking awareness to utilization of the digital information resources.

Yebowaah and Plockey (2017) investigated awareness and use of electronic resources in the University for Development Studies Library: Ghana as a case study. The major challenges associated with use of the e-resources were found to include low internet speed (38.8%) inadequate computers (11.3%), inadequate staff/lack of staff assistance (12.5% search). Although the participants were not strictly postgraduate students, these findings may influence students because lecturers may refer them to the e-resources that they know are relevant to the students use. Hence, they may serve as a source of awareness and refer all to postgraduate students they teach.

Ananda, Tejashini, Akshatha, and Jagdeesh, (2017) carried out a study on use and awareness of electronic information resources among undergraduates and postgraduate students of T. John College, Bangalore-India. The researches employed the survey design and a structured questionnaire was used to collect information from a sample of 100 students. Challenges encountered for using e-information resources included in order of magnitude, technical problems (53.1%), non-familiarity with the e-resources and inability to use e-resources (21.0%) by the students. One notable weakness about the finding is that data on awareness and use was not disaggregated for undergraduates and postgraduate students.

A study by Kashyap (2017) investigated the use of e-resources by postgraduate students of Government Nagarjun Postgraduate Science College Raipur, Chhattisgarh, India. The survey design method was used. Data was collected from a sample of 201 postgraduate students using a structured questionnaire. The results revealed that majority (23.1%) of the participants use e-newspapers, followed by-books (19.6%). This is surprising because newspapers are not authentic sources for academic purposes. The major problems faced by participants were slow downloading (32.6%), unease to study on computer screen (12.4%) and lack of training (11.5%).

Girakaduwa (2019) studied usage of electronic resources, services and challenges faces by the library users in University of the Visual and Performing Arts, Sri Lanka. A total of 450 library users took part in the study. Data was collected by use of online structured questionnaire. The main challenges to usage were identified as lack of infrastructural facilities, lack of user education and user awareness programs and lack of IT skills. Uzoigwe & Eze (2018) in Girakaduwa (2019) found that

majority of postgraduate students were aware of availability of e-resources and similarly use them.

In Nigeria, a few studies have investigated on awareness and utilization of e-resources in university libraries with a focus on postgraduate students in universities in North-Central, Nigeria. A study by Mamoh,(2020) investigated the utilization of digital reference resources and services by postgraduate students in university libraries in Benue State. Findings revealed that postgraduate students in the study area, to a high extent utilize digital reference resources. Further finding revealed the problems to utilization of the e-resources to include among others, irregular/inadequate power supply, lack of technical skills, lack of funds for purchasing e-resources and high cost of maintenance of the resources.

Adeleke, (2017) investigated availability, use and constraints to use of electronic information sources by postgraduate students at the University of Ibadan, Nigeria. Findings of the study revealed that internet and email were ranked as most available and used by the participants. There was low use of CD-ROM, e-journals and e-books by the participants in spite of available, which suggest that availability of e-resources does not automatically translate to actual usage. The findings further revealed the constraints to effective e-information resources use by the postgraduate students to include interrupted power supply as the most potent. Other factors were slow speed of computer, lack of technical skills to use search engines to retrieve information as well as slow internet speed.

## **Methods**

The research design adopted for this study is descriptive survey design. Descriptive surveys are those studies which aim at collecting data on, and describing in a systematic manner, the characteristic features or facts about a given population

(Abu-Bader 2021). This study is aimed at obtaining data on and describing awareness and utilization of digital reference services among postgraduate students in selected universities, North-Central Nigeria, their sources of acquiring reference services and the resources available. Survey research provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. It includes cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection with the intent of generalizing from a sample to a population (Abu-Bader, 2021).

The area of study is North-Central Nigeria, the study covers six universities. The population comprised all postgraduate students of the six universities involved who are registered library users. The random sampling technique was adopted for postgraduate students that were found using the library. This was intentionally done to ensure that those that will answer the questionnaire were postgraduate students that were familiar with the library and its resources.. The total sample was 92 participants. Almost the same sets of users were found to be using the library and this was responsible for the small size of the sample. Another factor for some university is the fact that they were on holiday when the research was carried out; while some postgraduate students felt that they were too busy to be filling questionnaire.

The instrument for data collection was the questionnaire. A questionnaire titled: "Awareness and Utilization of Digital resources among Postgraduate Students in Federal Universities" (AUDSPSFU), which is formulated in accordance with the research questions. The questionnaire is adapted by the researcher and consists of four parts (A-D) made up of nine items. Question (1-3) requires the respondent to fill in the correct answer. In section B, questions 4 and 5, respondents are given options to tick Yes

or No. While (6, 7, 8 and 9) are designed in-line with Likert scale format and requires respondents to tick any of the options to indicate their level of agreement or disagreement with the statement on a four scale response format. The reliability of the questionnaire was (.80) Cronbach's alpha.

The data was organized and analyzed following the research questions since the research design is descriptive survey. Also, descriptive method of data analysis was used in answering the research questions. Means and standard deviation were used to answer the research questions.

## Results

The results of this study are presented in this section.

The result from Table 1 shows that 57.6% of the participants were males, 42.4% were females. With regards to age of participants, the mean age of the participants was 31.69 years with a standard of deviation of 6.54years. 39.10% were in the age bracket of 26-30years of age. Other age groups and corresponding frequencies and percentages are as presented.

The institutions and library services of participants were analyzed and the result is represented in Table 2. The first segment of Table 2 presents the number of participants from each of the participating institutions. 31.50%. Next were 18.50% each and the lowest corresponding to 4.30%. The result indicates that 67.40% affirmed that their institutions subscribe to digital resources. Majority of participants affirmed their institutions subscribe to digital resources while 52.2% affirmed that the library provides adequate training on how to access digital resources. Regarding the importance of pre-training to utilization of e-resources, 80.4% opined that this is important.

**Research question one:** What is the level of awareness of availability of digital resources by postgraduate students in universities North-Central Nigeria?

The data in Table 3 provide answer to this question.

**Table 1: Social Demographic Characteristics of Participants**

Gender	Frequency	Percent	Mean Std. Deviation
Male	53	57.6	
Female	39	42.4	
<b>Total</b>	<b>92</b>	<b>100.00</b>	
<b>Age</b>			
21-25	12	13.0	
26-30	36	39.1	
31-35	11	12.0	
36-40	11	12.0	
41 and over	10	10.9	
No response	12	13.0	
<b>Total</b>	<b>92</b>	<b>100.00</b>	
<b>Educational qualification</b>			
First degree	70	76.1	
Masters' degree	12	13.0	
No response	10	10.9	
<b>Total</b>	<b>92</b>	<b>100.0</b>	<b>31.696.54</b>

**Table 2: Institutions and Library Services Offered**

Institution	Frequency	Percent
Kogi State University, Anyigba	17	18.5
University of Agriculture, Makurdi	15	16.3
Nasarawa State University, Keffi	10	10.9
University of Abuja	17	18.5
University of Ilorin	29	31.5
Plateau State University	4	4.3
<b>Total</b>	<b>92</b>	<b>100.00</b>
<b>Subscription status of e-resource</b>		
Yes	62	67.4
No	16	17.4
No response	14	15.2
<b>Total</b>	<b>92</b>	<b>100.00</b>
<b>Adequate training on how to access e-resource</b>		
Yes	48	52.2
No	32	34.8
No response	12	13.0
<b>Total</b>	<b>92</b>	<b>100.0</b>
<b>Opinion on importance of pre-training for use of e-resources</b>		
Yes	74	80.4
No	17	18.5
No response	1	1.1
<b>Total</b>	<b>92</b>	<b>100.0</b>
<b>Institutions' membership with IEEE, DENLET, INDEST-AICTE</b>		
Yes	40	43.5
No	26	28.3
Others	6	6.6
Not sure	20	21.7
<b>Total</b>	<b>92</b>	<b>100.0</b>

**Table 3: Level of Awareness of Availability of Digital Reference Resources to Postgraduate students, North-Central Nigerian Universities Libraries**

S/N	Digital reference resource/services	Not aware	Fairly aware	Quite aware	Very much aware
<b>Search engines:</b>					
1	Google	9(9.9)	6(6.6)	21(23.1)	55(60.4)
2	Alta Vista	14(15.6)	5(5.6)	19(21.1)	52(57.8)
3	Yahoo	15(16.5)	9(9.9)	27(29.7)	40(44.0)
4	MSN	21(23.1)	8(8.8)	23(25.3)	39(42.9)
5	Rediff	27(30.0)	11(12.2)	25(27.8)	27(30.0)
6	ASK	29(32.6)	12(13.5)	16(18.0)	32(36.0)
7	Lycos	29(32.6)	16(18.0)	19(21.3)	25(28.1)
8	Excite	31(34.4)	12(13.3)	17(18.9)	30(33.3)
9	Web crawler	21(24.1)	12(13.8)	16(18.4)	38(43.7)
<b>e-resources:</b>					
1	e-book	1(1.1)	16(17.4)	14(15.2)	61(66.3)
2	e-journals	4(4.4)	14(15.4)	13(14.3)	60(65.9)
3	e-dictionaries	2(2.2)	10(11.0)	19(20.9)	60(65.9)
4	e-theses	7(7.7)	13(14.3)	14(15.4)	57(62.2)
5	e-magazines	3(3.3)	11(12.0)	15(16.3)	63(68.5)
6	Online catalogs	2(2.2)	13(14.1)	15(16.3)	62(67.4)
7	Blogs	2(2.2)	12(13.0)	13(14.1)	65(70.7)
8	List servers	6(6.5)	13(14.1)	14(15.2)	59(64.1)
9	e-databases	3(3.3)	9(9.9)	16(17.6)	63(69.2)
<b>Digital library consortiums:</b>					
1	INDEST-AICTE	57(63.3)	23(25.6)	8(8.9)	2(2.2)
2	UGC-INFONET	60(66.7)	18(20.0)	10(11.1)	2(2.2)
<b>Full-text e-resources:</b>					
1	ACM digital library	54(58.7)	32(34.8)	4(4.3)	2(2.2)
2	ASME journals	48(52.7)	32(35.2)	7(7.7)	4(4.4)
3	EBSCO databases	46(51.7)	25(28.1)	4(4.5)	14(15.7)
4	Elsevier's science direct	41(46.8)	24(27.3)	3(3.4)	20(22.7)
5	Emerald full-text	41(46.1)	24(27.0)	5(5.6)	19(21.3)
6	IEEE/IEE electronic	43(48.9)	24(27.3)	11(12.5)	10(11.4)
7	Pro quest science	43(48.3)	26(29.2)	13(14.6)	7(7.9)
8	Springer link	47(53.4)	18(20.5)	19(21.6)	4(4.5)
<b>Bibliographic data-bases:</b>					
1	COMPENDEX	47(52.8)	31(34.8)	10(11.2)	1(1.1)
2	J-Gate Custom Content	42(47.2)	32(36.0)	9(10.1)	6(6.7)
3	MathSciNet	42(47.2)	29(32.6)	11(12.4)	7(7.9)
4	SciFinder Scholar	39(43.8)	30(33.7)	7(7.9)	13(14.6)
5	Web of Science	36(40.4)	30(32.6)	7(7.9)	16(18.0)
<b>Open Access Resources:</b>					
1	Open Access e-Journals	29(31.9)	10(11.0)	25(27.5)	27(29.7)
2	Open Access Directories	28(30.8)	9(9.9)	26(28.6)	28(30.8)
3	IRs @member Institution	33(37.9)	8(9.2)	24(27.6)	22(25.3)

It can be observed that with regard to search engines, participants were very much aware of Google (60.4%), Alta Vista (57.8%) and Yahoo engines (44%). On the other hand, they were least aware of Excite

(33.3%), Lycos (28.1%), and ASK (36%) engines respectively. In terms of e-resources, the result indicates that participants were very much aware of availability of blogs (70.7%), e-magazines

and e-databases (68.5% and 69.2% each) as well as E-books (66.3%) and online catalogs (67.4%). Participants were least aware e-theses (7.7%) and list-servers (6.5%) respectively. Majority of participants were not aware of availability of either INDEST-AICTE (63.3%) or UGC-INFONET (66.7%).

In terms of full-text e-resources, the findings indicate majority of participants were not aware of availability of these services/resources compared to those who were aware. For instance, 58.7% of participants were not aware of ACM digital library, 53.4% were not aware of Springer Link, while 52.7% were not aware of ASME journals. Unawareness of availability levels ranged from 58.7% to 46.1% while very much awareness ranged from 22.7% (Elsevier's Science Direct) to 2.2% (ACM Digital library).

In respect to bibliographic databases, the result revealed that most participants were not aware of availability of these resources. For instance, 52.8% of

participants were not aware of availability of COMPENDEX just as 47.2% each were not aware of availability of J-Gate Custom content and MathSciNet respectively. Those who were only fairly aware ranged from 36.0% (J-Gate Custom Content) to 32.6% (Web of Science).

With regards to Open Access Resources, more participants were aware than not aware of their availability. For instance, awareness for Open Access Directories was 30.8% (very much aware) and 28.6% (quite aware) while for Open Access Journals, it was 29.7% (very much aware) and 27.5% (quite aware). The resource with the least level of awareness was IRs @Member Institutions with 37.9% "not aware" and 25.3% "very much aware" availability.

**Research question two:** What are the digital resources utilized by postgraduate students for research in these libraries? The data in Table 4 are used to answer this question.

**Table 4: Digital reference services/resources utilized for research purposes by the postgraduate students**

S/N	E-resources/services for research	Frequency		Percent	
		No	Yes	No	Yes
1	e-book	27	62	30.3	69.7
2	e-journals	34	52	39.5	60.5
3	e-dictionaries	37	51	42.0	58.0
4	e-theses	37	48	43.5	56.5
5	e-magazines	36	48	42.9	57.1
6	e-catalogs	31	54	36.5	63.5
7	e-databases	26	62	29.5	70.5

The result from Table 4 shows that participants use about seven different digital reference digital resources for research purposes as presented. The most utilized of the e-resources is the e-database amounting to 70.5%. Least utilized e-resources by the participants. (58.5%).

**Research question three:** What is the frequency of use of digital resources by postgraduate students in these libraries? This question is answered with the data in Table 5.



**Table 5: Frequency of use of digital reference services by the postgraduates students**

S/N	Digital reference service/resource	Daily	2-3times weekly	Once a week	Occasionally
1	Internet	78(91.8)	5(5.9)	0	2(2.4)
2	CD ROM Services	8(17.4)	14(30.4)	10(21.7)	4(30.4)
3	Electronic Journals	8(15.1)	13(24.5)	6(11.3)	26(49.1)

Frequency of use of the internet on daily basis is 91.8%. CD ROM Services are used on daily basis by 17.4% of participants, while electronic journals are used by 15.1% of participants on daily basis and 49.1% occasionally. The most frequently used digital resource is the internet.

**Research question four:** What are the problems associated with the use of digital resources by postgraduate students in these libraries? Table 6 data are used to answer this question.

**Table 6: Problems associated with digital reference services delivery to the postgraduate students**

S/N	Factor/problem	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
1	Lack of online resources in related subjects	24(27.3)	11(12.5)	6(6.8)	39(44.3)	8(9.1)
2	Physical Inconvenience	18(20.5)	11(12.5)	3(3.4)	47(53.4)	9(10.2)
3	Library does not subscribe to e-resources	14.(15.9)	19(21.6)	15(17.0)	28(31.8)	12(13.6)
4	Access speed of internet is slow	6(6.8)	6(6.8)	3(3.4)	54(61.4)	19(21.6)
5	Inability to find relevant information	13(14.9)	28(32.2)	10(11.5)	28(32.2)	8(9.2)
6	Lack of access to full-text article	6(7.0)	14(16.3)	6(7.0)	47(54.7)	13(15.1)
7	Unorganized environment	17(19.8)	12(14.0)	12(14.0)	33(38.4)	12(14.0)
8	Difficult to read through screen	25(29.8)	14(16.7)	4(4.8)	32(38.1)	9(10.7)
9	Unaware of ideas	25(29.8)	15(17.9)	12(14.3)	25(29.8)	7(8.3)

It can be observed that the three topmost problems in order of magnitude include slow access speed of the internet (83.0%), lack of access to full-text articles (69.8%) and physical inconvenience (63.6%) as affirmed by the participants. Participants further agreed that the least among the problems are non-subscription to digital resources by the libraries (45.4%), inability to find relevant information (41.4%) and unawareness of ideas (38.1%).

**H<sub>01</sub>:** 1. There is no significant relationship between awareness and frequency of use of digital resources among postgraduate students of federal universities in North-Central Nigeria. This hypothesis is tested using correlation for this simple linear relationship and linear regression for a prediction relationship. The results are presented in Tables 7a and 7b.

**Table 7a: Pearson’s correlation analysis showing the relationship between awareness of e-resources and frequency of use by the postgraduate students**

Variables	N	Df	R	Sig.	Remark
e-resources awareness	92	90	.32	.003	Significant
Frequency of use	92				

The result of the Pearson’s product-moment correlation analysis shows that there is a significant positive relationship between awareness of e-resources and the frequency of utilization of same by the postgraduate students ( $r(df;90) = .32, P < .01$ ). This result means that as participants’ awareness of e-resources increases, there is a concomitant increase in the frequency of use of the e-resources. Similarly, increase in the frequency of use of the e-resources is associated with a significant increase of awareness of the e-resources by the participants. On the basis

of this finding, the null hypothesis was rejected and the alternate one confirmed. Thus, there is a significant relationship between awareness and frequency of use of e-resources by the postgraduate students.

In order to test for the predictive relationship, a linear regression analysis was used. Awareness of e-resources was taken as the predictor variable while frequency of use of e-resources as the outcome variable. The result of the analysis is presented in Table 7b.

**Table 7b: Simple linear regression analysis showing the predictive relationship between awareness and frequency of use of e-resources by the postgraduate students**

Variables	B	Std. Error	$\beta$	T	Sig.	R	R <sup>2</sup>	df	F	P
(Constant)	1.87	.85	-	2.21	.03	.32	.10	1.85	9.34	.01
Awareness of e-resources (IV)	0.04	.01	.32	3.06	.003					
Frequency of use of e-resources (d.v)										

The result in Table 7b shows the predictive relationship between awareness of digital resources and frequency of use of the resources by postgraduate students in North-central Nigeria universities libraries. The result of the regression analysis shows that awareness of digital resources significantly predicts the frequency of use of e-resources by the postgraduate students ( $\beta = .32, p < .01$ ). The R<sup>2</sup> value of .10 indicates that awareness of e-resources accounts for about 10% of the variance in the frequency of use of the e-resources among the postgraduate students.

The ANOVA Statistic shows a significant F-ratio (i.e.  $F(1, 85) = 9.34,$

$P < .01$ ). This value indicates that the model is a good fit of the data.

On the basis of this finding, the null hypothesis was rejected and the alternative hypothesis confirmed. This means that awareness of e-resources significantly predicted the frequency of use of e-resources by postgraduate students in university libraries in North-Central Nigeria investigated.

**H<sub>02</sub>:** 2. There are no significant problems associated with use of digital resources by postgraduate students in university libraries in North-Central Nigeria.. This hypothesis is tested using Chi-square goodness-of-fit test.

**Table 8: Chi-square Goodness-of-Fit showing problems associated with use of e-resources encountered by the postgraduate students**

Problems	$\chi^2$	Df	Sig.	Remark
Not many online resources available in related subject	40.71	4	.001	
Physical inconveniences	67.91	4	.001	
Library does not subscribe	9.16	4	.06	
Access speed is slow	102.80	4	.001	
Unable to find relevant information	22.25	4	.001	
Lack of information to useful text article	67.84	4	.001	
Unorganized	19.23	4	.001	
Difficult to read through screen	31.60	4	.001	
Unaware of ideas	15.29	4	.001	

The result shows that only one was not significant. That is “library does not subscribe (to digital resources) ( $\chi^2$  (df; 4) = 9.16,  $P > .05$ ). All the other 8 encountered by Postgraduate students are significant ( $\chi^2$ ) at  $p$ -less than 0.05 levels of significance. Null hypothesis was rejected and the alternative hypothesis confirmed.

**H<sub>03</sub>:** There is no significant relationship between frequency of use of digital resources and the problems associated with use of e-resources by postgraduate students in universities in North-Central Nigeria. This hypothesis is tested using Pearson’s product-moment correlation. The result is presented in Table 9.

**Table 9: Pearson’s Product-Moment Correlation analysis showing the relationship between frequency of use and problems associated with use of e-resources by the postgraduate students**

Variables	N	Df	R	Sig.	Remark
Frequency of use of e-resources	87	85	-.28	.01	Significant
Problems associated with use of e-resources	87				

The result of the Pearson’s correlation analysis indicates that there is a significant but negative correlation between frequency of use of digital resources and problems associated with use of such. ( $r(df;85) = -.28, P < .01$ ).

### Discussion

This study was conducted with the main purpose to investigate the awareness and utilization of digital resources among postgraduate students in selected universities, North-Central Nigeria. Four specific objectives and corresponding research question were stated to guide the study. Three hypotheses were postulated and tested. These form the cornels for the discussion of findings from the data analysis in this subsection of the study. The findings of the research questions are discussed first followed discussion of the

hypotheses. Conclusion is drawn from the discussion, and recommendations based on the findings,

The first research question investigated the level of awareness of availability by postgraduate students of digital reference resources such as search engines, e-resources, digital library consortium, full-text e-resources, bibliographic data bases and open access resources. Findings revealed that awareness of availability was highest for e-resources such as blogs and e-journals, followed by search engines such as Google and Alta Vista. However, there is low awareness of availability for the other digital awareness investigated. This finding suggests that the web is a well-known digital resource by students, including postgraduate students. Hence, they are likely to use it more frequently

than the other digital resources. This finding supports many previous studies in the literature (Togia&Tsigilis, 2009; Kashyap, 2017; Ananda et al; 2017; Yebowaah, 2017; Olajide & Adedokun, 2018).

The finding that there was less awareness of availability of the other digital sources that are more specialized and perhaps, may possess richer contents than resources on the web is worrisome, particularly for the fact that postgraduate work is advance study that requires knowledge in specialized areas with deep content resources.

The second research question sought to ascertain the digital resources that are utilized by the postgraduate students for research purposes. Generally, postgraduate students use averagely all the seven e-services for the research. These were e-journals, theses, catalogs, magazines and dictionaries. The implication of the finding is that the research purpose, the postgraduate students make use of the diverse sources of e-services and this could enrich their research work in content and quality. This is the expectation foe postgraduate students' use of e-journals for research work (Togia and Tsigilis 2019).

The third research question inquired into the frequency of use of digital references by the postgraduate students in university libraries in North-Central Nigeria. Findings indicate very high daily frequency use (91.8%) of the internet but very low for CD-ROM and e-journals. This finding confirms that high awareness of availability of digital resources by the postgraduate students translated in high usage of this resource on daily basis. The individuals investigated in this result were postgraduate students, who it was expected should be more discerning in their use of digital resources, still relied on the internet instead for "more sophisticated and authenticated resources" (Togia&Tsigilis, 2009) which some

scholars express concern about the use of information from them by students (Thomson, 2003; Togia et al; 2009).

In research question four, the study identified the problem encountered by the postgraduate students in accessing digital reference services in the university libraries investigated. The two top most of these were slow access speed of the internet and lack of access to full-text articles. The slow speed of the internet costs users in time and data while lack of access to the latter limits the quality and sophistication of information for research work of the postgraduate students. These findings support the prevalent evidence on the most of the problems encountered by users of digital reference services in university libraries (e.g. Adeniran, 2013; Yeboah, 2017; Olajide and Adedokun, 2018).

The first hypothesis tested the relationship between awareness and frequency of use of digital services by the postgraduate students. There was both an association and predictive relationship between the two variables. The latter implies that, being aware of availability of digital resources significantly predicts the frequency of usage of the resources. This implies that barring any other impediments, the more aware graduate students are of digital resources the more frequently they would tend to use. This finding supports the position of other researchers (Okwu & Boma, 2022). (Okoli, Ukwedeh, & Idah,2021).

The second hypothesis tested to find out if postgraduate students encounter significant problems with use of digital resources in their university libraries. This study found that the students' numerous significant problems. These included slow access speed of the internet, lack of relevant information/text articles as well as unorganized library environment. Others included inability to read through screen and lack of relevant search skills/ideas by the students.

The third hypothesis tested the association between frequency of usage and the problems associated with use of digital resources. The finding revealed there is an expected significant negative relationship. This implies that, if library users encounter significant problems in accessing digital resources, the frequency of use would be significantly reduced due to discouragement.

### Conclusion

The findings of this study led to the following conclusion. There is high awareness of availability of web-based digital resources such as e-journals, and search engines but less so for databases among the participants. The postgraduate students utilized the digital resources, mostly e-databases for research and to a lesser extent e-books and e-journals for the same purposes. The frequency of use of the internet on daily bases was very high among the postgraduate students. There is a significant link between awareness and usage of digital reference resources such that higher level of awareness influenced utilization of the e-resources. Postgraduate students encounter significant problems in accessing digital references.

The following are recommended based on the results of the study:

1. Management of the university libraries should put in place consistent programs for all postgraduate students to create awareness for the digital resources available in their libraries.
2. Reference libraries in particular should take initiatives to encourage use of digital resources by postgraduate students to enhance their research work.
3. University management should increase budgetary allocations to their libraries to enable them acquire digital equipment such as computers, upgrade their search

engines and provide alternative sources of power supply to enhance effective use of the digital library resources.

4. University libraries should carry out regular trainings for library users to enhance their skills in use of digital resources in their libraries.

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