JOURNAL OF INFORMATION AND KNOWLEDGE MANAGEMENT
2024, VOL. 15, NO. 2, 27-43: ISSN: 2141-4297 (print) 2360-994X (online)
https://dx.doi.org/10.4314/iijikm.v15i2.3

To cite this article: Jibrin, A, Mohammed, Z. Umar, L, & Maifatu, M. N. (2024) Digital literacy competencies of postgraduate students for access and use of digital information resources and services in university libraries in Kaduna State. Information Impact: *Journal of Information and Knowledge Management*, 15:2, 27-43, DOI https://dx.doi.org/10.4314/iijikm.v15i2.3

To link to this article: https://dx.doi.org/10.4314/iijikm.v15i2.3

Digital Literacy Competencies of Postgraduate Students for Access and Use of Digital Information Resources and Services in University Libraries in Kaduna State

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Abstract

This study was carried out to determine the digital literacy competencies of postgraduate students for access and use of digital information resources and services in university libraries in Kaduna State. In order to achieve this, two research questions and one null hypothesis were formulated and tested in the study. Survey research method was adopted for the study. The population of the study consisted of 18,130 postgraduate students from the 3 universities namely; Kashim Ibrahim Library (KIL) of Ahmadu University, Zaria, Kaduna State University (KASU) Library and Nigerian Defence Academy (NDA) Library and 377 of them were drawn as the sample size of the study. A structured open-ended questionnaire was developed by the researcher. For data analysis, tables, frequency counts and percentages were used. One-way ANOVA was used to test the hypothesis. It was discovered that postgraduate students studied have possessed digital literacy competencies such as ability to define specific information needs prior to the search; can use a number of search engines when sourcing; can select online materials for my use etc. Also, it was found that there is significant difference among the postgraduate students in the digital literacy competencies they possessed to access and use digital information resources and services in the University Libraries of Kaduna State. The need for the regular training in order to equip postgraduate students with relevant soft skills on digital literacy organized by the university library management is highly recommended.

Keywords

Digital literacy, postgraduate students, university libraries, electronic information resources,

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Introduction

It is a statement of fact to argue that attaining proficiency in digital literacy competence is a targeted educational objective in higher education, given its status as a prerequisite for citizens to navigate, work, and thrive in the digital era where technology and the internet play a pervasive role in daily life. Recognizing education as a potential means of preparing citizens for the digital environment, it is crucial to embed digital literacy competencies in academic practices at the university level. According to Leu (2019) digital literacy competence is intricately linked with information communication technology (ICT), enabling active engagement with the internet and other ICTs. This engagement involves tasks such as identifying important questions, locating information, critically evaluating its utility, synthesizing information, and effectively communicating answers to queries. Digital literacy competencies encompass a specific set of knowledge that empowers students to function and participate fully in a digital world. Despite the general perception of contemporary students as digital natives proficient in technology use, digital literacy competencies entail the ability to locate, organize, understand, evaluate, and create information using digital technologies and the Internet (Chan et al., 2017; Sadaf & Johnson, 2017; Phuapan et al., 2016; Leahy & Dolan, 2016).

Digital literacy competencies involve the adept application of digital skills in conjunction with critical thinking across diverse digital platforms and devices. Possessing digital literacy competencies imply a combination of digital skills, competence, knowledge, practical ability, research, digital learning, understanding, evaluation, interpretation, creation, and communication. Ukachi (2014) defines competency as a set of knowledge and attitudes that an individual must have for a specific context. Digital competency refers to the set of knowledge, skills, and attitudes individuals need to use digital technologies effectively. In this regard, it is imperative for postgraduate students to possess some digital literacy competencies in order to access and use digital information resources and services deployed for them in their university libraries. Competence is the ability to integrate and apply contextually-appropriate knowledge, skills and psychosocial factors (e.g., beliefs, attitudes, values and motivations) to consistently perform successfully within a specified domain, (Vitello et al, 2021).

In the same vein, According to Commonwealth of Australia (2020) digital literacy incorporates the ability to search and navigate, create, communicate and collaborate, think critically, analyse information, and address safety and wellbeing using a variety of digital technologies. These skills are essential for individuals to participate effectively in today's society. Digital literacy skills exist on a continuum with varying degrees of competency required depending on the context (personal and community; workplace and employment; education and training) within which the skills are applied. More so, Mishra et al (2017) expanded the concept of digital literacy competencies to encompass cognitive skills, defining it as "the ability to understand and use information in multiple formats with an emphasis on critical thinking rather than information and communication technology skills." Hague and Payton (2020) further detailed eight components of digital literacy, including creativity, critical thinking and evaluation, cultural and social understanding, collaboration, finding and selecting information, effective communication, e-safety,

and functional skills. In a broader sense, the attributes of digital literacy competencies can be understood as the proficiency of postgraduate students in utilizing digital applications for tasks such as searching, retrieving, and utilizing information in the library context. As university libraries increasingly automate their systems, operations, resources and services due to the advances in information and communication technologies, more digital contents are being created and acquired. Consequently, it is imperative for postgraduate students to be digitally literate, in order to enable them to efficiently search and utilize digital information resources and services. Postgraduate students lacking adequate digital literacy competencies may face challenges in accessing, retrieving, and utilizing digital information and services, as noted by Tella and Mutula (2018), who argued that students with higher digital literacy competencies are more likely to readily access and utilize electronic information resources and services.

Statement of the Problem

In the digital age, the proliferation of technology and the Internet has brought transformative changes in every human endeavour, including library and information service delivery. In fact, the evolving growth of the Internet underscores the increasingly profound impact of digital information resources and services in our university libraries. According to National Bureau of Statistics (NBS) database revealed that the number of Internet subscribers stood at 163.8 million as of December 2023. (Punch, 25th February, 2024). In the digital age, individuals inevitably require appropriate literacy competencies to effectively utilize these technologies. As noted by Leahy and Dolan (2016), accessibility to technology implies that individuals must possess the necessary competencies to utilize it efficiently and safely.

Digital literacy competencies are identified as a crucial asset for postgraduate students in accessing relevant information in university libraries through ICT facilities and the Internet. Possessing digital literacy competencies facilitate effective information searching and usage and thereby help in producing quality researches. This development has made it possible for postgraduate students to remotely access and use digital information resources and services through their personal computers, smartphones, and tablets, provided they are registered students of their respective universities. Regrettably, the researcher observed that despite the availability of digital information resources and services for access and use by postgraduate students in the university libraries in Kaduna State.

On this note, the researchers speculate that, could this scenario might be as a result of postgraduate students' lack of digital literacy competencies needed for access and use of the vast literature scatted on the net for smooth running of their research writing? It is against this backdrop that this study was carried out to determine the digital literacy competencies of Postgraduate Students for access and use of digital information resources and services in university libraries in Kaduna State

Research Questions

The following research questions guided this research:

1. What digital literacy competencies do the postgraduate students possessed for access and use of digital information resources and services in the university libraries in Kaduna State, Nigeria?
2. To what extent do the digital literacy competencies of postgraduate students helped improve their access and use of digital information resources and services in the university libraries in Kaduna State, Nigeria?

Hypothesis

The following null hypothesis was tested:

H01: There is no significant difference among postgraduate students in the digital literacy competencies possessed for access and use of digital information resources and services in the university libraries in Kaduna State, Nigeria.

Digital Literacy Competencies among Postgraduate Students

Over the years, the concept of information technology literacy has shifted from technical approaches to more reflective ones regarding Information and Communication Technologies (ICTs). This shift was highlighted by the ICT Literacy Panel proposed in 2002 by the Educational Testing Service (ETS). In this panel, ICT Literacy refers to the ability to use communication technologies and tools for accessing, managing, integrating, evaluating, and creating information in a manner that facilitates successful integration into daily life. Building upon this model, a research group from PISA has developed an ICT Assessment tool, still in the testing phase, encompassing sections such as basic technical skills, short scenarios (addressing basic e-mail functions), web search proficiency (the ability to select and evaluate internet research), and simulation tasks (dealing with the comprehension of experimental models).

Advancements in Information Literacy research have also taken place. In 2000, the Association of College and Research Libraries (ACRL) advocated for new standards in defining digital literacy. These standards emphasized the capacity to determine the nature and extent of needed information and the critical evaluation of information as essential components (ACRL, 2000). Regardless of the terminology used, authors unanimously acknowledge the complexity of the concept. Digital literacy competence is not merely the outcome of simple elements of ability or instrumental knowledge; instead, it represents a complex integration of cognitive processes, dimensions, methodological approaches, and ethical awareness.

Among the various expressions employed, the term "digital competence" was chosen to align with the European Recommendation and the widespread use of the term "competence" in educational language. This definition underscores the coexistence of dimensions characterized by technological, cognitive, and ethical levels, highlighting their integration.

- Technological Dimension: The capacity to navigate and address challenges in new technological contexts with flexibility.
- Cognitive Dimension: The ability to read, select, interpret, and evaluate data and information while considering their relevance and reliability.
- Ethical Dimension: The capability to engage constructively with others, demonstrating a sense of responsibility through the use of available technologies.

• Integration between Dimensions: Understanding the potential of technologies that facilitate information sharing and collaborative knowledge-building.

The understanding of digital literacy is multi-dimensional and overlapping. Its terms and definitions evolved around the time; some researchers consider it skills and competencies, while others consider it a combination of multiple literacies (Reddy et al., 2022). Digital literacy, according to Faloon (2020), is a set of abilities to use the website to access, discover, organize, and modify electronic information as well as participate in online communication and other online information and communication networks. He further stated that digital literacy competencies are set of skills to access the internet, find, manage and edit digital information; join in communications, and otherwise engage with an online information and communication network. Digital literacy is the ability to properly use and evaluate digital resources, tools and services, and apply it to lifelong learning processes (1997). The importance of digital literacy in today's world helps people be more perceptive when seeking out information and communicating with one another. Digital literacy is also crucial for fostering imaginative and creative thinking, which is necessary for conducting critical analysis and resolving issues relating to digital sensitivities, (Ahmad et al, 2023)

Studies in Nigeria, including those by Okeji et al, (2020), Osinulu (2021) & Ilori et al (2023) have reported varying levels of digital literacy among university students, librarians and library staff. They found that there is a high level of digital literacy competence among the respondents investigated. Also, findings from Ozoemelem (2009), Asemi & Riyahiniya (2009), and Rosenberg (2006) all highlighted the challenges universities face in providing comprehensive digital literacy programs, especially for postgraduates and academic staff. Also, Previous studies on digital literacy competencies have extensively discussed the topic within professional bodies such as the Society of College, National, and University Libraries (SCONUL, 2011), the American Library Association (2011), ACRL (2011), the American Association of School Librarians (1998), and UNESCO (2008). According to these organizations, digital literacy involves the ability to use information and communication technologies for finding, evaluating, creating, and communicating information, requiring a combination of cognitive and technical skills.

Additionally, the International Federation of Library Associations and Institutions (IFLA) (2006) described digital literacy competence as the ability to identify when information is needed and the capability to carry out specific tasks or solve problems. Also, to efficiently seek information, organizing digital sources, interpreting, analyzing, and retrieving necessary information, appraising accuracy and reliability, and observing ethical use of digital sources are crucial aspects of digital literacy competence. According to IFLA (2006), digital literacy competence is an integral component alongside other literacy skills like information literacy, computer literacy, network literacy, information technology literacy, and media literacy. UNESCO (2008) views digital literacy as a tool for teaching and learning, emphasizing that individuals need to understand why, when, and how to apply digital systems and tools, developing the ability to operate them successfully.

Methodology

For the purpose of this study, a descriptive survey research design was used. The population for the study comprised of postgraduate students in public universities in Kaduna State, namely Ahmadu Bello University (ABU) Zaria (9820), Kaduna State University (KASU) (2978), and Nigerian Defence Academy (NDA) Kaduna (5332) with the overall total of 18, 130 postgraduate students. The sample size of Three Hundred and Seventy-Seven (377) postgraduate students was selected using the Krejcie and Morgan sample size table of 1970. A structured open-ended questionnaire was developed by the researcher and the questionnaire was administered personally with the assistants of 2 research assistants. A duration of three (3) weeks was used to administer the questionnaire. The face and content validity of the instrument was realized through experts' assessment and corrections. The data analysis was firstly done using descriptive statistics such as frequency counts and percentages for the research questions. Thereafter, inferential statistics using One-way ANOVA was used to test the hypothesis respectively.

Findings and Discussion

Out of the three Hundred and Seventy-Seven (377) copies of the questionnaire distributed to the postgraduate students across the three Universities in Kaduna State, Nigeria, three hundred and seventy-four (374) copies of them were returned, duly completed and found fit for analysis. This represents 99.2% response rate. The analyses, findings and discussion were presented as follows:

Digital Literacy Competencies Possessed by Postgraduate Students for Access and Use of Digital Information Resources and Services in the University Libraries in Kaduna State

The researcher attempted to determine the digital literacy competencies possessed by the postgraduate students for access to digital information resources and services in the university libraries studied. To achieve this, a five-point Likert scale was used to collate the opinions of the respondents in that regard. However, the 5-point Likert scale was collapsed to 3 points to ease analysis and comprehension as follows: SA- Strongly Agree; N- Neutral; D- Disagree. The responses of the respondents are presented in table 1:

Table 1: Digital Literacy Competencies Possessed by Postgraduate Students for Access and Use of Digital Information Resources and Services in the University Libraries in Kaduna State.

S/N	Digital Literacy Competencies for Access and use	University Libraries Studied								
		KIL, ABUZ			KASU Library			NDA Library		
		SA	N	D	SA	N	D	SA	N	D
1.	I am able to define my specific information needs prior to the search	125 (61.5)	3 (1.5)	75 (37.0)	40 (65.5)	3 (4.9)	18 (29.5)	77 (70.0)	1 (.9)	32 (29.0)

2.	I can use a number of search engines when sourcing Information	147 (72.5)	7 (3.4)	49 (24.1)	21 (34.5)	0 (0.0)	40 (65.5)	37 (34.0)	5 (4.5)	68 (62.0)
3.	I can select online materials for my use	57 (28.0)	19 (9.4)	127 (63.0)	38 (62.2)	3 (4.9)	20 (33.0)	77 (70.0)	1 (.9)	32 (29.0)
4.	I can store information from electronic sources by printing or saving to disk/flash drive	145 (71.5)	5 (2.5)	53 (26.1)	41 (67.2)	0 (0.0)	20 (33.0)	72 (65.5)	5 (4.5)	33 (30.0)
5.	I can use Boolean search techniques	76 (37.4)	24 (11.8)	103 (51.0)	10 (16.4)	6 (9.8)	45 (74.0)	13 (12.0)	21 (19.1)	76 (69.1)
6.	I can select materials on topics accurately	122 (60.0)	24 (11.8)	57 (28.1)	40 (65.5)	3 (4.9)	18 (29.5)	20 (11.2)	11 (10.0)	79 (72.0)
7.	I can limit online search by fields	129 (64.0)	10 (4.9)	64 (31. 5)	40 (65.5)	6 (9.8)	18 (29.5)	25 (23.0)	16 (14.5)	69 (63.0)
8.	I can use mailing list to exchange information	120 (59.1)	10 (4.9)	73 (36.0)	40 (65.5)	3 (4.9)	18 (29.5)	70 (64.0)	11 (10.0)	29 (26.4)
9.	I can use discussion groups to exchange information	65 (32.1)	25 (12.3)	113 (56.0)	18 (29.5)	3 (4.9)	40 (65.5)	25 (23.0)	18 (16.4)	67 (61.0)
10.	I can use news groups to obtain information	97 (48.0)	23 (11.3)	83 (41.0)	6 (2.0)	10 (16.4)	45 (74.0)	30 (27.3)	23 (20.9)	57 (52.0)
11.	I can access blogs for needed information	86 (42.4)	14 (6.9)	103 (51.0)	11 (18.0)	8 (13.1)	42 (69.0)	34 (34.1)	16 (14.5)	60 (54.5)
12.	I have the ability to recognize the source of an electronic document by looking at the hyperlink.	79 (38.1)	12 (5.9)	112 (55.2)	19 (31.1)	0 (0.0)	42 (69.0)	33 (30.0)	15 (13.6)	62 (55.5)
13.	I can conveniently access needed information from Electronic Information Sources for problem solving independently	133 (65.5)	13 (6.4)	57 (28.1)	40 (65.5)	0 (0.0)	21 (34.5)	71 (65.0)	14 (12.7)	25 (23.0)
14.	I can effectively use the library OPAC to search for specific library materials	74 (36.4)	27 (13.3)	102 (50.2)	7 (11.5)	14 (23.0)	40 (65.5)	43 (39.1)	18 (16.4)	49 (45.0)

15.	I am very good in the downloading /uploading of information	132 (65.0)	0 (0.0)	71 (35.0)	38 (62.2)	0 (0.0)	23 (38.0)	85 (77.3)	5 (4.5)	20 (18.2)
16.	I have good Internet navigation skill	149 (73.0)	7 (3.0)	49 (42.1)	42 (69.0)	0 (0.0)	19 (31.1)	85 (77.3)	5 (4.5)	20 (18.2)

Key: SA – Strongly Agreed N – Neutral D – Disagree

Table 1 showed the digital literacy competencies in accessing and use of digital information resources and services by the postgraduate students in university libraries in Kaduna State. It is crystal clear from the table that postgraduate students in all the university libraries studied have strongly agreed to have possessed some kind of digital literacy competencies as contained in statements under item 1, 2, 3, 4, 6, 7, 8, 13, 15 and 16 respectively. These competencies include: ability to use of a number of search engines while in search of digital information resources; the ability to define specific information needs; ability to select online information resources; storing of information from electronic sources; selection of materials on any topic; ability to limit online search; use of mailing list to exchange information; ability to conveniently access information; ability to download/upload information; and ability to navigate the Internet very well respectively. This finding is a pointer to the fact that a majority of the postgraduate students in the university libraries studied were digitally competent especially with regards to access and use of digital information resources and services provided in their respective university libraries.

However, it was found that postgraduate students across the university libraries studied disagreed to have possessed competencies under item 5, 9, 10, 11, 12 and 14 respectively. These digital competencies as represented under the items are: use of Boolean search techniques; use of discussion groups to exchange information; use of newsgroup; ability to access blogs and use hyperlinks in search for in formation and I can effectively use the library OPAC to search for specific library materials respectively.

The above findings corroborate that of conference organized by (UNESCO, 2020), at Geneva. The findings indicated that 67% of the sample that have access to digital resources possessed digital literacy competencies. Hence, they have the ability to define specific information needs; ability to select online information resources; storing of information from electronic sources; selection of materials on any topic; ability to limit online search; use of mailing list to exchange information; ability to conveniently access information; ability to download/upload information; and ability to navigate the Internet very well order to effectively manage and use digital information resources respectively.

In the same vein, Yevelson-Shorsher & Bronstein (2018) reported that digital literacy competencies enable learners to access and evaluate information in response to identified needs, define key terms and topics, locate information and present information in the appropriate context. However, the finding means that ability to

use a number of search engines while in search of digital information resources found to be the major influencing to postgraduate student when access digital information resources and services. While almost all the items mentioned has the element of least scores regardless of the university.

Extent of Digital Literacy Competencies helped improve Access and Use of Digital Information Resources and Services by Postgraduate Students in the University Libraries in Kaduna State

In order to determine the extent to which digital literacy competencies helped improve access and use of digital information resources and services by the postgraduate students in the university libraries studied, the researcher provided a list of statements for the postgraduate to indicate their agreement or otherwise. A five-point Likert scale was used to collate the opinions of the respondents but the 5-point Likert scale was collapsed into 3 points to ease analysis and comprehension as follows: SA- Strongly Agree; N- Neutral; D- Disagree. The responses of the respondents are presented in table 2.

Table 2: Extent to which Digital Literacy Competencies helped Improve Access and Use of Digital Information Resources and Services by Postgraduate Students in the University Libraries in Kaduna State

S/N	Extent to which Digital Literacy Competencies Improved Use of Digital Information Resources	University Library Studied								
		KIL, ABUZ			KASU Library			NDA Library		
		SA	N	D	SA	N	D	SA	N	D
1.	It has improved my capability on how and where to find the digital information I need	151 (74.5)	0 (0.0)	52 (25.5)	47 (77.1)	0 (0.0)	14 (23.0)	79 (72.0)	5 (4.5)	26 (24.0)
2.	It has improved and make my findings it easy to locate digital information sources	160 (78.0)	8 (3.9)	35 (18.4)	47 (77.1)	0 (0.0)	14 (23.0)	74 (67.3)	10 (9.1)	26 (24.0)
3.	It has changed my capacity on selection of digital information that is most appropriate to	158 (77.2)	7 (3.4)	38 (19.2)	46 (75.4)	0 (0.0)	15 (25.1)	79 (72.0)	5 (4.5)	26 (24.0)

	my needs.									
4.	It has improved my ability to select search strategies by date, subject and language.	125 (66.0)	8 (3.9)	74 (30.5)	45 (74.0)	0 (0.0)	16 (26.2)	84 (79.2)	0 (0.0)	26 (24.0)
5.	It has improved my digital information literacy competence by learning from my information problem solving experience	160 (78.0)	8 (3.9)	35 (18.4)	46 (75.4)	0 (0.0)	15 (25.1)	79 (72.0)	5 (4.5)	26 (24.0)
6.	It has improved my ability to use many resources at the same time to make research	144 (56.1)	25 12.3)	34 (17.1)	42 (69.0)	3 (4.9)	16 (26.2)	79 (72.0)	6 (5.5)	25 (23.0)
7.	It has boosted my ability to use digital information to answer questions or solve problems	156 (76.2)	0 (0.0)	47 (28.0)	13 (21.4)	0 (0.0)	48 (79.0)	74 (67.3)	0 (5.4)	36 (41.0)
8.	It has improved my capability to evaluate www sources	105 (52.0)	11 (4.9)	87 (43.0)	13 (21.4)	3 (10.0)	45 (74.0)	74 (67.3)	11 (10.8)	25 (23.0)
9.	It has improved my capability to organize, apply and communicate information to others digitally	136 (76.0)	22 (9.1)	45 (22.1)	46 (75.4)	0 (4.5)	15 (25.1)	69 (63.0)	5 (14.3)	36 (41.0)
10.	It has improved my capability to search strategies using Boolean logic and keywords	92 (45.4)	29 (4.9)	82 (40.4)	12 (20.0)	3 (12.7)	46 (75.4)	60 (55.0)	11 (14.9)	32 (33.0)

11.	It has improved my synthesis to figure out newly gathered digital information with previous information	98 (38.1)	10 (4.9)	95 (47.0)	14 (23.0)	3 (10.0)	44 (72.1)	74 (67.3)	11 (12.8)	25 (33.0)
12.	It has facilitated my synthesis to build upon existing digital information	98 (38.1)	26 (4.9)	79 (39.0)	14 (23.0)	3 (4.9)	44 (72.1)	66 (60.0)	9 (17.2)	35 (32.0)
13.	It has improved my actions toward defining the digital information I need has improved	131 (69.0)	35 (13.4)	37 (15.3)	46 (75.4)	0 (9.1)	15 (25.1)	69 (63.0)	10 (6.4)	31 (28.8)
14.	It has improved my determination on the authoritativeness, correctness and reliability of the digital information sources	148 (73.2)	13 (6.4)	42 (20.4)	15 (25.1)	0 (11.8)	46 (75.4)	61 (55.5)	13 (11.3)	36 (41.0)
15.	It has improved my capacity to organize digital information to present a sound central idea supported by relevant material in a logical order	135 (67.3)	22 (9.1)	45 (22.1)	46 (75.4)	0 (16.4)	15 (25.1)	56 (51.0)	18 (11.3)	36 (41.0)
16.	It has improved my capability to organize, apply and communicate	155 (80.0)	23 (9.2)	25 (10.1)	46 (75.4)	0 (0.0)	15 (25.1)	74 (67.3)	0 (3.9)	36 (41.0)

Key: SA – Strongly Agreed N – Neutral D – Disagree

Table 2 above showed the extent to which digital literacy competencies helped improve access and use of digital information resources and services by the postgraduate students in university libraries in Kaduna State. It is crystal clear from the table that postgraduate students in all the university libraries studied have strongly agreed to have possessed some kind of digital literacy competence and have helped improve their access and use of digital information resources and services as contained in statements under item 1, 2, 3, 4, 5, 6, 7, 9, 13, 14, 15 and 16 respectively. These competences include: the ability to define specific information needs; ability to select online information resources; storing of information from electronic sources; selection of materials on any topic; ability to limit online search; use of mailing list to exchange information; ability to conveniently access information; ability to download/upload information; and ability to navigate the Internet very well respectively. This finding is a pointer to the fact that a majority of the postgraduate students in the university libraries studied were digitally competent and that has helped them greatly to improve their access and use of digital information resources and services provided in their respective university libraries.

However, it was found that postgraduate students across the university libraries studied disagreed to have possessed competences under item 8, 10, 11, and 12 respectively and therefore has not helped them improve their access and use of digital information resources and services. These digital competences as represented under the items are: use of a number of search engines while in search of digital information resources; use of Boolean search techniques; use of discussion groups to exchange information; use of newsgroup; ability to access blogs and use hyperlinks in search for information. The improvement of digital literacy competences plays important roles in research, learning, and teaching. Students who lack digital literacy competences experience frustration in their academic activities. According to Hadimani & Rajgoli (2010), medical students require advanced degree of digital literacy competences to achieve success in their activities.

Test of Hypothesis

Under this section, inferential analysis was done in order to test the hypotheses formulated for the study with the view to either retain or reject the hypothetical statements made by the researcher. This was done at the fixed alpha level of 0.05.

Hypothesis I: There is no significant difference among postgraduate students in the digital literacy competences possessed for access and use of digital information resources and services in the university libraries in Kaduna State, Nigeria.

Table 3: One Way Analysis of Variance on Digital Literacy competence possessed for Access and Use of Digital information resources and services by postgraduate students of university libraries in Kaduna State

Variables	Sources	Sum of Squares	df	Mean Square	F	Sig.
Digital Literacy competence for information resources	Between Groups	55.795	2	27.897	20.521	.000
	Within Groups	504.365	371	1.359		
	Total	560.159	373			
Digital Literacy competence for information services	Between Groups	61.091	2	30.545	21.521	.000
	Within Groups	526.571	371	1.419		
	Total	587.662	373			

(Critical value for F at 2, 371 df and at 0.05) = 3.00

The result of the test in table 4 revealed that the postgraduate students differed significantly in their digital Literacy competence for access and use of digital information resources and services by their university libraries. The observed F-value was 20.521 obtained at 2, 371, degree of freedom (df) with a p-value of 0.000 ($p < 0.05$). The variability on digital Literacy competence for information services by post graduates from the different university libraries was significant. Observed F-value was 21.521 obtained at 2, 371, degree of freedom (df) with a p-value of 0.000 ($p < 0.05$). With these observations, there is enough evidence to reject the null hypothesis. The null hypothesis that, there is no significant difference among the Postgraduate Students in the Digital Literacy Competence possessed to access and use digital information resources and services in the University Libraries in Kaduna State is therefore rejected. The mean score for post graduate students of the different universities on the two variables are summarized in Table 5.

Table 4: Mean scores on Digital Literacy competence for access and use of digital information resources and services by postgraduates in university libraries studied

		Digital Literacy competence for information resources			Digital Literacy competence for information services		
University	N	Mean	Std. Dev.	Std. Error	Mean	Std. Dev.	Std. Error
KASU	61	2.44	1.258	0.161	2.45	1.295	0.166
ABU	203	3.43	1.173	0.082	3.46	1.176	0.083
NDA	110	3.55	1.099	0.105	3.64	1.160	0.111
Total	374	3.31	1.225	0.063	3.34	1.255	0.065

From the table 5, mean scores of the post graduate tended to vary by students' university. To determine the groups that were significantly different from the others in their digital literacy competence for information resources and services, the means were subjected to a post hoc test using the Scheffe procedure. The result is summarized in Table 6.

Table 5: Result of Scheffe test on mean scores of digital literacy competence for digital information resources and services in university libraries for postgraduate students.

Dependent Variable	University(I)	University(J)	Mean Difference (I-J)	Std. Error	Sig.
Digital Literacy competence for information resources	KASU	ABU	-.99282*	.17025	.000
		NDA	-1.11432*	.18613	.000
	ABU	KASU	.99282*	.17025	.000
		NDA	-.12150	.13804	.379
	NDA	KASU	1.11432*	.18613	.000
		ABU	.12150	.13804	.379
Digital Literacy competence for information services	KASU	ABU	-1.00833*	.17395	.000
		NDA	-1.19078*	.19019	.000
	ABU	KASU	1.00833*	.17395	.000
		NDA	-.18245	.14105	.197
	NDA	KASU	1.19078*	.19019	.000
		ABU	.18245	.14105	.197

*** The mean difference is significant at the .05 level.**

The result of the test in the table 6 revealed that variability in the digital literacy competence for information resources and services by post graduate students of ABU were significant different from those of KASU but not significantly different from those of NDA. Between post graduate students of NDA and those of KASU, there was significant difference in their digital literacy competence for information resources and services.

Conclusion

The use of digital literacy by postgraduate students has been discovered to be necessary for access to digital information resources and services to fulfill their primary aim of obtaining certificates in their area of study. It is therefore necessary for the postgraduate students to acquire digital literacy competences and skills in order to optimize access and use of digital information resources and services provided by their university libraries. More so, the challenges associated with the postgraduate students' digital literacy competences should be thoroughly addressed in order to improve access and use of digital information resources and services for enhanced research productivity in the universities studied. Hence, this calls for the re-engineering of the university library's functions, operations, staffing and processes to align with the dynamics of digital information environment. Ultimately, this development, will promote, enhance and guarantee access and use of digital information resources and services in the university libraries studied and above all increase the quality of the postgraduate students' research output.

Recommendations

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

1. The University library management should as a matter of policy introduce regular training of postgraduate students on digital literacy skills and competences in order to equip them with the required competences for access and use of digital information resources and services. This will go a long way in improving and promoting access and use of such digital resources and services.
2. there is the need for training and retraining of library staff to be acquainted with operation of modern digital information resources and service, couple with digital literacy competence that will boost and make their services very effective.
3. A course titled "Digital information literacy competences and skills" should be introduced as a course unit for all postgraduate students in the university studied as a faculty course. This course should be designed and taught by library and information professionals.

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