

RELATIONSHIP BETWEEN MEDIA RESOURCES UTILIZATION AND POSTGRADUATE STUDENTS' RESEARCH OUTPUTS IN FEDERAL UNIVERSITY LIBRARIES IN NIGERIA

By

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Abstract

The study investigated the relationship between media resources utilization and post-graduate students' research outputs in Nigerian federal university libraries. A sample of 2,016 postgraduate students was selected from a population of 40,328 from six universities. Data was collected using observation checklists and structured questionnaire, with a response rate of 77.5%. The results showed a low relationship between media resource utilization and postgraduate research outputs. Availability of hard disk drives, computers, and Internet was found to be 9.7%, but the utilization level fell below the benchmark of 2.5. The challenges include irregular electricity supply and poor Internet connectivity. The null hypotheses of no significant relationship were rejected. The study concludes that university libraries, particularly in developing countries, are crucial for impactful scientific research globally, with ICT playing a key role in building knowledge, facilitating learning, and increasing collaboration. The National Universities Commission should ensure allocation of adequate funds for the provision of media resources in the library for quality research output by postgraduate students

Keywords: *Information and Communication Technology (ICT); Library media resources; Postgraduate students; Research output; Nigerian Federal Universities*

Introduction

In the 21st century, libraries play crucial roles by serving as knowledge hubs to provide the right information to the right users at the right time, format, and in the much-needed quantity. University libraries owe it a key duty to keep pace with technological advancement in order to cope with the users' complex information needs. Universities are the engine of social and economic growth.

According to the Encyclopedia Britannica (2023), the word university is an institution of higher education, usually comprising a college of Liberal Arts and Sciences, providing facilities for teaching and research and is authorized to grant academic degrees. The name is from the Latin word "*universitas*," meaning 'a whole' that admits both undergraduate and postgraduate students. On the other hand, postgraduate (PG) students are the second category of students in universities. PG students are those who undergo courses in universities (either part-time or full-time) after obtaining the first degree (NUC, 2023). According to Hornby, in Nworgu (2015), there are three categories of postgraduate students. They are Postgraduate Diploma (PGD) students, Master's

degree programme students and Doctoral (Ph.D) students. PGD programme is usually a one-year duration programme while the Masters programme is expected to be completed in a minimum of one year and a maximum of two years, as the case may be. The Doctoral degree is expected to be completed in a minimum of two and a maximum of three years before graduation. The postgraduate student is expected to undertake both a course work and research in fulfilment of the requirements for successful completion of the postgraduate studies. To this end, the present study looked into the connection between the use of media resources in the library and the postgraduate students' research output and as moderated by age.

Age is the number of years a person has existed since birth. Okiki and Asiru (2011) noted that age is a variable which has been found to correlate with the utilization of ICT resources in universities. Younger people tend to use modern technologies than the older ones. Age is a factor in technological usage. Therefore, this study examined the relationship between media resources utilization in university libraries and postgraduate research output.

University libraries are information centers that serve university communities, providing services to staff, students, researchers, and communities. They can be federal, state or private. The objective of a university library is to provide a wide range of scholarly materials aligned with the institution's mission (Federal Ministry of Education, 2019). Libraries offer a wide range of resources, including digital multimedia devices, hard drives, and computers in order to meet the needs of postgraduate students' research interests. These resources serve as communication channels and storage media for information resources, ensuring efficient and effective utilization of resources.

Media resources have revolutionized how information is accessed, consumed, and shared in libraries and information centers (Fakunle, 2023). In the same vein, Omeluzor and Bamidele (2013), in their study on the relevance of a library in the 21st century, inferred that the rapid advancement in technology, libraries have evolved from traditional repositories of printed materials to dynamic multimedia hubs, offering an array of resources that cater for the diverse needs and preferences of their users, which include audio recordings, video materials, digital images, interactive software, among others. Library media resources play a crucial role in promoting access to information, supporting learning and research, fostering literacy and digital literacy, preserving cultural heritage, engaging communities, promoting equity and inclusivity, and supporting lifelong learning endeavours (Olubiyo, 2022). Akindehin (2023) emphasized that library media resources support academic and research endeavours by offering reliable and credible information sources where students, researchers, and scholars can access scholarly articles, peer-reviewed journals, textbooks, and other materials essential for their studies and investigations. In this study, the media resources include but not limited to digital versatile disk, hard disk drive, computers, flash drives, tape recorders, cassettes and scanners used by postgraduate students.

Utilization is the noun form of the verb utilize, meaning to make good use of something, such as use of ICT media resources in the library for research purposes. ICT media resources are utilized for practical purposes, such as in postgraduate programmes (Kiptalam, 2013). Knowledge and skills in ICT media resource use are knowledge-based education that enable postgraduate students to explore these resources for research, improve research report writing, and graduate programmes. Williams and Channaveeriaah, in Ivwighrehweta (2013), observed that libraries have shifted their role from traditional information resources custodians to service-oriented digital

resources due to the widespread use of computers, rapid growth of ICT media resources, increased reliance on information, and the explosion in information quality and quantity.

The word 'research' originated from the Latin word '*recherchia*', which means to delve, examine, probe or seek new knowledge until solution is found to advance the course of development (Britanica.com, 2023). Postgraduate students' research outputs significantly contribute to society's development, providing answers to questions and reflecting their interests in a field (Akopporhonor and Akpojotor, 2016). These outputs are supervised by academic staff, reflecting the intellectual base of the discipline and the extent of research coverage in the field. Analyzing these reports using ICT media resources is crucial for fulfilling postgraduate degree requirements. Examples of research outputs include textbooks, chapters, patents, monographs, papers, journal articles, technical reports, scientific conference papers, abstracts, and ongoing paper writing (Bamigboye, Bamidele, Nihinlolawa and Abimbola 2018).

Research output is a pathway in which research is made available to people other than the author or a particular publication, communication, dissemination, presentation which can be in form of books, journal articles, patents, invention among others (Raw Materials Research and Development Council - RMRDC, 2021). Gireesh-Kumar (2020) added that research output is the process by which academics, scholars, and researchers share and publish their research findings in order to make them available to the larger academic community and beyond.

Background to the study area

Nigeria has 265 universities, with 53 federal, 63 state, and 149 private universities (<http://nuc.edu.ng>, 2024). Federal universities are the majority with 36 approved for postgraduate programmes. The Education Tax Fund (ETF) was established under Act No. 7 of 1993 as a Tax Fund to improve higher education quality and library development in Nigeria. It supports essential physical infrastructure, institutional materials, research, staff training, and other library needs. The ETF Act was repealed in May 2011 and replaced by the Tertiary Education Trust Fund Act in 2021.

Federal university libraries in Nigeria have shifted their focus from traditional teaching and learning to utilizing ICT media resources in postgraduate studies and research output (Aju, and Tofi, 2020). The emergence of ICT has enabled universities to enhance the postgraduate research process and effectively produce research output, such as projects, dissertations, theses, reports, and seminar papers. Ezekwe (2019) and Sunusi, Mustapha and Ahmad (2021) added that ICT media resources have led to a more digital environment, allowing for more efficient and effective communication between faculty and students. The use of ICT media resources in libraries for postgraduate research in Nigerian federal universities remain a challenge, with many students struggling to effectively use it. The lack of records on library ICT media resources utilization and their impact on postgraduate students' research output remains a guesswork. The study, therefore, aimed to establish the relationship between library ICT media resources and postgraduate students' research output.

Statement of the Problem

Nigerian university libraries have invested in media resources to improve information dissemination for postgraduate students. However, the researcher observed that utilization of library media resources by postgraduate students could be a challenge due to various factors, such as limited awareness of the numerous resources available in the library due to information

overload, and difficulty in finding those resources that are most relevant to their research works. Another challenge is technological barriers such as limited access to computers, poor Internet connectivity, or lack of familiarity with digital resources and databases; all of these hinder the ability of postgraduate students to effectively navigate and utilize library media resources. Other constraints may include time demanding schedules, such as coursework, research work, teaching responsibilities, other commitments, lack of training and support. Without adequate training and support from the library staff, some postgraduate students struggle to maximize the benefits of library media resources. This often leads to poor quality research output. Available literature shows that there is moderately little research on media resource utilization for research, particularly the relationship between library media resources and postgraduate students' research output; hence the concern of this study is on media resources utilize in libraries as correlate of postgraduate students' research output in Nigerian federal universities. It is against this background that this study was undertaken.

Objectives of the study

The main aim of the study was to examine the relationship between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities. The specific objectives were to:

1. Identify the available media resources utilized in libraries by postgraduate students in Nigerian federal universities.
2. Determine the level of research output of postgraduate students in the federal universities in Nigeria.
3. Examine the relationship between media resources utilized in libraries and postgraduate students' research output in the federal universities in Nigeria.
4. Identify the challenges associated with media resources utilization in libraries by postgraduate students in the federal universities under study.

Hypotheses

- Ho1. There is no significant relationship between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities.
- Ho2. There is no significant relationship between media resources utilization in the libraries and postgraduate students' research output in Nigerian federal universities as moderated by age.

Scope of the Study

This study centered on the relationship between media resources utilization in libraries and postgraduate students' research output in six (6) selected Nigerian federal universities located in each of the six (6) geopolitical zones of the country. The study was limited to the first generation federal universities only; where resources were available. The postgraduate students in the six universities were used as the subjects of the study. The study was limited to media resources and postgraduate students in the selected Nigerian federal universities..

Review of Literature

Available Media resources utilization in Libraries

Information and communication technology (ICT) media has evolved into a more viable, proficient, and collective approach, enabling researchers and universities to collaborate, share resources, and offer online courses (Clement and Duinem, 2015). Teamm (2019) added that Postgraduate students require various media tools, including DVDs, HDDs, and CD-ROMs.

Nigerian libraries utilize ICT media, including computers, storage media, and telecommunications, for information storage, retrieval, and dissemination. These devices, including personal computers, CD-ROMs, faxes, scanners, and the internet, serve as primary and secondary storage devices for the library community (Ankamag, kussah and Adams, 2018). The finding of Heng, Hamid and Khan (2020) and Nair (2021) stated that libraries utilize various ICT media resources to enhance access to information and improve services for their users. Such as: Online Catalogs, Digital Libraries, Databases and E-resources, Internet Access, E-learning Platforms, Digital Preservation Systems, Library Websites and Portals, Library Mobile Applications, Collaborative Tools and Assistive Technologies. Onunga (2021) added that libraries continuously adapt to technological advancements and may explore emerging technologies like virtual reality, augmented reality, and artificial intelligence to enhance their services and resources

For this study, media resources are tools library use for storage, retrieval and dissemination of information resources in libraries, the include: Digital Versatile Disk (DVD), Hard Disk Drive (HDD), Compact Disk-Read Only Memory (CD-ROM), Computers, Library Software (web-based Online Public Access Catalogue (Web-OPAC), Internet, Flash drives, Digital Cameras, Scanners, Tape recorder/cassettes, Printers/duplicating machine, e-mail and social media interactive channels, Floppy discs, Magnetic tape, Zip/optical discs e.t.c use to enhance research process.

A study by Thanuskodi and Kumar (2017) found that the respondents have average level of e-resources usage skills, particularly on awareness about many available e-resources. The variables of the respondents namely gender and age groups, were significantly influencing their e-resource usage skills and its dimensions. Frequency of access is daily among the respondents belonging to below 35 years age group. The study is related with the current study as it highlights the utilization of e-resources and internet connective with research output of journal publication. But differ in population of ophthalmologists from eye clinics while the current study used postgraduate students from federal universities.

Studies on postgraduate students' research output

Atanda and Olasupo (2018) focused on the research output of academic staff at the University of Ibadan in Nigeria. The study aimed to determine the level of research productivity and investigated two hypotheses regarding gender differences and differences across academic cadres. The study found that academic staff had good research output in terms of publishing journal articles, chapters in books, and conference papers, but poorer output in publishing textbooks, co-authored textbooks, monographs, and patents. Batcha (2018) analyzed the research output of six top universities in Tamil Nadu, India. The study examined the growth pattern, dissemination, citation distribution, highly cited authors, research areas, and preferred countries of collaboration for publishing research results. The study used data from the Web of Science database for the period 2000-2017 and analyzed the downloaded bibliographic details.

Namenya (2014) focused on the utilization of information communication technology (ICT) facilities for research output among postgraduate students at the University of Nairobi in Kenya. The study assessed the frequency of ICT usage, available facilities, staff competence, challenges faced by students, and possible solutions. The study used a case study research design, employed both qualitative and quantitative approaches, and utilized a semi-structured questionnaire as the main data collection instrument. Van Biljon & Mwapwele (2023) conducted a study titled "Research collaboration in asymmetric power relations: A study of postgraduate students' views" The study aimed to assess the research productivity of postgraduate students and

identify the factors influencing their research output. The researchers collected data from a sample of postgraduate students and analyzed their research publications, citations, and collaboration patterns.

Tella & Onyancha (2020) conducted a study titled "Scholarly publishing experience of postgraduate students in Nigerian Universities". The study aimed to identify the factors that influence postgraduate students' research output in Nigerian universities. The researchers surveyed a sample of postgraduate students and collected data on their research activities, research skills, supervision quality, and research environment. Oladejo and Adebayo in Onuoha, Ifeanyi, and Yunisa, (2020) conducted a study titled "Assessment of Research Output among Postgraduate Students in Nigerian Universities." The study aimed to assess the research output of postgraduate students in Nigerian universities and identify the challenges they face in conducting research. The researchers collected data from a sample of postgraduate students and analyzed their research publications, research skills, and research-related challenges.

These studies provide insights into the research output of postgraduate students in different countries and highlight the various factors that influence their productivity. They contribute to understanding the challenges and opportunities for postgraduate students in conducting research and making valuable contributions to their respective fields

Challenges associated with media resources utilization in libraries and postgraduate students' research output

Problems affecting the use of library media resources by Postgraduate Students are numerous. A study was conducted by Desmannu and Owoaje (2018) to assess the barriers to research and training needs of students at the University of Ibadan. The study documents the challenges of research students in tertiary institutions in Nigeria which are quite varied and multifaceted. These included inadequate research infrastructures (facilities, equipment and electricity) and funding. Others barriers to postgraduate research were: lack of funding (61%), irregular electricity supply (51%), and lack of access to research materials (56%). Others included lack of reward/recognition for outstanding research (29%), non-functional laboratories (19%), university bureaucracy (18%) and inadequate support for research collaborations (18%). In terms of accessing research funding, the identified barriers included lack of information (46%) and inadequate mentoring (35%). Only 20% had obtained international research grants for their research projects. Ninety-one percent of the respondents required training on proposal development (90%), seeking funding (86.0%), and evaluation of interventions (83.0%). Omeluzor and Aluko-Arowolo (2023) in their studied shown that the university library is faced with a lot of challenges including inadequate funding for the acquisition of relevant information resources in meeting the information needs of postgraduate students. Some university libraries are facing inadequate desktop computers to access databases, while on the part of the PG students, some studies revealed that their major challenges were absence of regular orientation, lack ICT training and ICT skills in the use of library resources (Uwandu, 2022; Onanuga; Ilori & Kusoro, 2020). An earlier study reported that a lower patronage of the library by the postgraduate students at Olabisi Onabanjo University Ago-Iwoye, Nigeria was due to paucity of current and relevant resources in the library (Awojobi, 2004).

Akporhonor and Akpojotor (2016) carried out a study that was aimed at identifying the challenges confronting postgraduate library and information science students in the use of electronic resources in southern-Nigeria. The finding revealed that poor internet connectivity, epileptic power supply, information overload, high cost of access, download delay and difficulty

in accessing some websites are some of the problems militating against the use of electronic information resources by postgraduate students of library and information science in southern Nigeria.

A study was carried out by Oluwasanu, et al (2019) on causes and remedies for low research productivity among postgraduate scholars and early career researchers on non-communicable diseases in Nigeria. The result shows that there is weak research capacity by poor government and donor funding and limited opportunities for training, conferences and structured capacity building programs for early career researchers in Nigeria. It also shows limited use of available research output to guide government policy actions and programs.

Research Method

Correlational survey research design was employed for the study. The population of the study consisted of 40,328 registered postgraduate students in the six selected federal universities in Nigeria as at 2018/2019 academic session. A sample size of 2,016 (5%) postgraduate students formed the subject of this study. The universities selected in each geo-political zone were: University of Ibadan, Oyo State; University of Nigeria, Nsukka, Enugu State; Ahmadu Bello University, Zaria, Kaduna State; University of Benin, Edo State; University of Ilorin, Kwara State; and University of Maiduguri, Borno State. Observation check list and structured questionnaire were used for data collection using google form through social media platforms like WhatsApp groups, Telegram groups and email, etc. Out of the 2,016 expected responses from the postgraduate students, 1,563 (77.5%) respondents filled the online questionnaire. The qualitative data collected was used to analyse research objective number 1 using frequency count, percentage and mean with 2.5 as the benchmark. The quantitative data collected from the study was analysed using linear regression to address research objective number 2. Process macro analysis was used to answer research objective number 3, while hypothesis 2 Regression ANOVA was used to test the hypotheses 1 at 0.05 level of significant.

Results and Discussion of Findings

In order to determine the available media resources utilization in libraries and postgraduate students' research output in the Nigerian federal universities studied, observation check lists of possible library media resources were highlighted to the heads of postgraduate libraries in the universities studied requesting them to tick as many options as possible. Table 1 below shows the available media resources.

Table 1: Available media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities

Media resources	UI	UNN	ABU	UB	UIL	UM	F	%
Digital Versatile Disk (DVD),	√	√	≠	√	√	x	4	6.5
Hard Disk Drive (HDD)	√	√	√	√	√	√	6	9.7
Compact Disk-Read Only Memory (CD-ROM)	√	√	≠	√	√	≠	4	6.5
Computers	√	√	√	√	√	√	6	9.7
Library Software (web-based)	√	√	≠	√	√	≠	4	
Online Public Access Catalogue (Web-OPAC)								6.5
Internet	√	√	√	√	√	√	6	9.7

Flash drives	√	√	√	√	√	√	6	9.7
Floppy discs	≠	√	√	≠	√	≠	3	4.8
Tape recorder/cassettes	≠	√	√	≠	≠	≠	2	3.2
Magnetic tape	≠	√	≠	≠	≠	≠	1	1.6
Zip/optical discs	≠	√	≠	≠	≠	X	1	1.6
Digital Cameras	√	√	√	√	√	X	5	8.1
Scanners	≠	≠	≠	√	√	√	3	4.8
e-mail and social media interactive channels	√	√	√	√	√	√	6	9.7
Printers/duplicating machine	≠	√	√	√	√	√	5	8.1

Key: **UI**=University of Ibadan; **UNN**=University of Nigeria Nsukka; **ABU**=Ahmadu Bello University, **UB**=University of Benin; **UIL**=University of Ilorin; **UM**=University of Maiduguri; √=available; ≠= available but not usable; x= not available

Table 1 shows that, all the universities studied have hard disk-drive, computers, internet, flash drives, and email/social media interactive channels with score of 6 (9.7%) each. This is followed by digital cameras and printers/duplicating machine with a score of 5(8.1%) each. The least available media were magnetic tape, zip/optical discs and tape recorder/Cassettes with a score of 1(1.6% and 3.2%) respectively. The above media resources show what is available in the libraries studied. The respondents were asked to indicate their age to enable the researcher to show the relationship between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities as moderated by age, their responses are shown in Table 2 below.

Table 2: Age distribution of the respondents

Age	Frequency	%
21-30	278	17.8
31-40	621	39.7
41-50	556	35.6
51 and above	108	6.9
Total	1563	100%

Table 2 shows that ages 31-40 with a score of 621(39.7%) form the majority of postgraduate students in the universities studied. This is followed by ages 41-50 with the score of 556 (35.6%). While the minority were between the ages of 51 and above. The respondents were asked to indicate appropriately by ticking [√] any option that described the media resources they utilized for research output in universities studied. **Key: HU=Highly Utilized; MU=Moderately Utilized; FU=Fairly Utilized and NU =Not Utilized.** Their responses are shown in Table 3.

Table 3: Level of Media Resources Used by Post Graduate Students for Research

Items	NU	FU	MU	HU	Mean
ICT resources (Media)					
Digital Versatile Disk (DVD), Hard Disk Drive (HDD) and	380(24.3%)	611(39.1%)	334(21.4%)	238(15.2%)	2.275

Disk-Read Only Memory (CD-ROM)					
Computers	410(26.2%)	541(34.6%)	313(20.0%)	299(19.1%)	2.321
Library Software (web-based)					2.107
Online Public Access Catalogue (Web-OPAC)	463(29.6%)	645(41.3%)	279(17.9%)	176(11.3%)	
Internet	404(25.8%)	625(40.0%)	240(15.4%)	294(18.8%)	2.271
Flash drives, Floppy discs,					2.111
Tape recorder/cassettes,	476(30.5%)	626(40.1%)	272(17.4%)	189(12.1%)	
Magnetic tape					
Zip/optical discs	540(34.5%)	611(39.1%)	272(17.4%)	140(9.0%)	2.008
Digital Cameras	559(35.8%)	606(38.8%)	263(16.8%)	135(8.6%)	1.983
Scanners	543(34.7%)	597(38.2%)	266(17.0%)	157(10.0%)	2.024
e-mail and social media					2.075
interactive channels	509(32.6%)	615(39.3%)	251(16.1%)	188(12.0%)	
Printers/duplicating machine	478(30.6%)	621(39.7%)	241(15.4%)	223(14.3%)	2.134

Table 3 above indicated the level of media resources utilization for research output by postgraduate students in the universities studied. It shows that the media resources were in the negative because none was up to the bench mark of 2.5. This implies that the resources are available in the libraries but the level of use is minimal. It is assumed that the students are not aware of the available media resources, or they are not literate to use the resources, or they don't use the library for their research work. This agrees with the study of Namenya (2014) that shows that, despite the availability of media resources in the libraries in University of Nairobi, postgraduate students' level of utilization was low. The respondents were asked to indicate their level of agreement with how media resources in the library aided their research output. Their responses are shown in Table 4 below.

Table 4: Postgraduate students' research output

Postgraduate students' research output	SD	D	A	SA	MEAN
Project	289(18.8%)	575(36.8%)	408(26.1%)	291(18.6%)	2.448
Dissertation	352(22.5%)	611(39.1%)	342(21.9%)	258(16.5%)	2.324
Thesis report	442(28.3%)	537(34.4%)	325(20.8%)	259(16.6%)	2.257
Journal article	482(30.8%)	522(34.4%)	316(20.2%)	243(15.5%)	2.205
Seminar paper	483(30.9%)	546(34.9%)	331(21.2%)	203(13.0%)	2.163
Conference presentation	485(31.0%)	563(36.0%)	350(22.4%)	165(10.6%)	2.125

Monograph	540(34.5%)	588(37.6%)	329(21.0%)	106(6.8%)	2.001
Technical report	536(34.3%)	554(35.4%)	367(23.5%)	106(6.8%)	2.028
Patent and certified invention	544(34.8%)	559(35.8%)	357(22.8%)	103(6.6%)	2.012
Blogs/website	532(34.0%)	518(33.1%)	298(19.2%)	215(13.8%)	2.125

The postgraduate students' research output in the federal universities selected was measured with 10 items in a four-point Likert scale. According to the result in table 4, 611(39.1%), 588(37.6%) and 575(36.8%) disagreed with the utilization of ICT infrastructure to dissertation, monograph, and project respectively, while only 103(6, 6%), 106 (6.8%) and 165(10.65) strongly agreed with the utilization of ICT to patent and certified invention, technical and conference presentation research output. The cumulative mean of 1.00 of 4point scale is below the benchmark of 2.5.

To calculate the level of relationship between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities, Table 5 below shows the correlation coefficient between media resources used in the library and postgraduate research output.

Table 5: Linear Regression Analysis of the Relationship between Media resources Utilization in Libraries and Postgraduate Students Research Output

Variables	R	R ²	Adjusted R Square	Std. Error of the Estimate
ICT Media Resources Utilization and Postgraduate Students' Research Output	.250	.063	.062	.39160

(R²) = Coefficient of Determination

Table 5 shows that the correlation coefficient between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities was 0.250. The result indicates that there is a positive low relationship between ICT media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities. The result also revealed that the coefficient of determination (R²) associated with the correlation coefficient of 0.250 is 0.063. The coefficient of determination (R²) of 0.063 implies that media resources utilization in libraries accounts for 6.3% of postgraduate students' research output in Nigerian federal universities. This is an indication that 93.7% of the variation in postgraduate students' research output in Nigerian federal universities is attributed to other factors other than media resources utilization in libraries. Significant positive low relationship exists between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities.

This low utilization of media resources may be due to the lack of ICT skills among students or inadequate training and marketing efforts by library staff. The findings align with the previous studies of Osagie (2008) and Abubakar, Gupiyem and Banwer (2017) that also highlighted the low utilization of ICT resources in Nigerian universities. They emphasize the global trend of universities promoting awareness and maximum usage of library resources among students.

Another studies that support these findings indicate that students use e-library resources but lack awareness and skills to utilize them effectively (Onuoha, Ifeanyi and Yunisa, 2020) and (Ravta, Tikam, Rohitash, Rahul, Aditya and Harshita, 2021). However, the results contradict a study of Akpojotor (2016) that found library and information science students in southern Nigerian universities to be highly aware of and skilled in using ICT resources. Overall, the article suggests the need for extensive awareness programmes during orientations and workshops in Nigerian universities to promote the availability and utilization of ICT media resources.

To determine the relationship between media resources utilization in libraries and postgraduate students' research output in the Nigerian federal universities as moderated by age, process macro analysis was used to analyze the data in Table 6 below.

Table 6: Process Macro Analysis on the Relationship between media Resources Utilization in Libraries and Postgraduate Students' Research Output as Moderated by Age

Model		R ²	SE	T	P
1	Age	.23	.0219	-2.63	.0085

Table 6 revealed that a coefficient of determination of .23 was obtained for the relationship between ICT resources utilization in libraries and postgraduate students' research output in the Nigerian federal universities as moderated by age. The result indicates that age moderated 23% of the relationship between media resources utilization in libraries and postgraduate students' research output in the Nigerian federal universities. In order word, the relationship between media resources utilization in libraries and postgraduate students' research output (Project, dissertation, journal article, seminar paper, conference presentation, monograph, technical report, patent and certified invention and blogs/website) in the Nigerian federal universities as moderated by age shows coefficient of determination (R²) account for 23% significant relationship, this means age of postgraduate students in the utilization of media resources in the library is a factor to their research output. This is not surprising because large number of postgraduate students are older and can afford media resources like computers, internet, payment of e-books and printing facilities among others for their research work. This finding in line with Ruzagea and Msonde (2021) noted that the age range of the student at the Muhimbili university of Health and Allied Science Tanzania variations in age groups may be having some influence on e-resources usage behaviour, which align with the results from previous studies Akpojotor, (2016) and Thanuskodi and Kumar (2017) that found younger students are more inclined to using e-resources than their older counterparts.

To identify the challenges faced by postgraduate students in using media resources, the researcher provided list of possible challenges to choose from, and the responses are shown in Table 7.

Table 7: Challenges associated with media resources utilization in libraries by postgraduate students

Challenges	F	%
lack of orientation and awareness	864	55.3
inadequate ICT training	408	26.1
lack of technological literacy skills in searching for relevant information	1,113	71.2
Poor internet connectivity	1,487	95.1
inadequate or lack of research media resources	792	50.7

irregular electricity supply	1,511	96.7
library staff bureaucracy	892	57.1
Information overload	583	37.3

Table 7 shows the challenges associated with media resources used in libraries with a score of 1,511(96.7%) of the respondents indicating irregular electricity supply, followed by poor Internet connectivity 1,487(95.1%), and the least is inadequate ICT training 408(26.1%) and information overload 583(37.7%). This implies that postgraduate students' research works may suffer a set back in terms of effective and efficient research output. This finding is in line with the study of Akoporhonor and Akpojotor (2016) revealed that poor internet connectivity, epileptic power supply, information overload, high cost of access, download delay and difficulty in accessing some websites are some of the problems militating against the use of electronic information resources by postgraduate students of library and information science in southern Nigeria.

Hypothesis Testing:

Hypothesis one: There is no significant relationship between media resources utilization in libraries and postgraduate students' research output in Nigerian federal universities.

Table7: Regression Analysis Significant Relationship between Media Resources Utilization in Libraries and Postgraduate Students Research Output

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	16.024	1	16.024	104.497	.000 ^b
	Residual	239.375	1561	.153		
	Total	255.399	1562			

Table 7 shows that an F-ratio of 104.497 with associated exact probability value of 0.00 was obtained. When compared the probability value of 0.00 with 0.05 set as level of significance for testing the hypothesis, it was found to be significant because 0.00 is less than 0.05. Hence, the null hypothesis of no significant relationship between ICT media resources utilization in libraries and postgraduate students research output in Nigerian federal universities was rejected. The researcher therefore, concludes that there is a significant relationship between ICT media resources utilization in libraries and postgraduate students research output in Nigerian federal universities.

Hypothesis 2: There is no significant relationship between media resources utilization in the libraries and the postgraduate students' research output in the Nigerian federal universities as moderated by age.

Result in Table 6 was also used to test hypothesis two. It revealed that t value of -2.63 with exact probability value of 0.0085 was obtained. Thus, the null hypothesis of no significant relationship between media ICT resources utilization in the libraries and the postgraduate students' research output in the Nigerian federal universities as moderated by age was rejected. The decision was based on the fact that the probability value of 0.0085 was less than the level of significance set at 0.05. The researcher therefore concludes that there is a significant relationship between media resources utilization in the libraries and the postgraduate students' research output in the Nigerian federal universities as moderated by age.

Age moderated 23% of the relationship between media resources utilization in libraries and postgraduate students' research output in the Nigerian federal universities. Further analysis revealed a significant relationship between media resources utilization in libraries and postgraduate students' research output in the Nigerian federal universities as moderated by age.

Conclusion

The study emphasizes the significant role of media resources in enhancing research output of postgraduate students, particularly in the context of Nigerian federal universities. It asserts a correlation between the utilization of media resources in libraries and postgraduate research output. The study underscores that universities, especially in developing countries, are crucial for impactful scientific research globally, with media resources playing a key role in building knowledge, facilitating learning, and increasing collaboration among institutions. Despite these potential benefits, the passage notes a lag in investment in media resources in libraries, hindering the academic mission of universities. It emphasizes the critical importance of up-to-date media resources for effective thesis, projects, journal articles, and inventions. This suggests that universities should be serious about research and also prioritize the integration of leading-edge ICT tools to support various academic functions.

Recommendations

In the light of the findings of this study, the following recommendations are considered appropriate.

1. The library managements of the universities investigated should intensify awareness services on the media resources available in their libraries by organising regular training on the use of media resources, production of flyers, banners and orientation of postgraduate students using the media resources to reach out to them.
2. Training of postgraduate students on media resources utilization skills should be improved so as to enhance the use of media resources in the library.
3. The Nigerian Universities Commission (NUC) should ensure adequate funding to the federal university libraries for the provision of media resources for the enhancement of quality research by postgraduate students.
4. Provision should be made for laptop/computer loans to postgraduate students so as to facilitate their research output.
5. ICT infrastructure such as computers, Internet connectivity as well as alternative power supply should be provided in the university libraries, so as to allow the postgraduate students to effectively utilise available media resources for quality research output.

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