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# The Role of Online Information Resources in Enhancing Scholarly Research and the Challenges of Their Utilization among Library and Information Science Postgraduate Students in South-West Nigeria

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ABSTRACT

Online information resources are critical to scholarly research, yet their utilization among postgraduate students is often constrained by infrastructural, financial and skill-related barriers, particularly in developing contexts. This study examined the role of online information resources in enhancing scholarly research and the challenges affecting their utilization among Library and Information Science (LIS) postgraduate students in selected universities in South-West Nigeria. A descriptive survey design was adopted. The population comprised all LIS postgraduate students in selected federal, state and private universities in South-West Nigeria, and the entire population of 324 students (114 males and 210 females) was studied. Data were collected using the Online Information Resources for Scholarly Research Questionnaire (OIRSRQ) and an observation checklist. The instruments were face-validated by three experts and pilot-tested, yielding Cronbach's alpha coefficients ranging from 0.70 to 0.86 and an overall reliability coefficient of 0.89. Data were analysed using frequencies, percentages, means and standard deviations, while the hypotheses were tested with independent samples t-tests at the 0.05 level of significance. Online information resources enhanced scholarly research to a high extent, with a cluster mean of 3.39 (SD = 0.70). The major challenges to utilization were slow loading and blockage of websites, improper guidance on the use of online resources, insufficient bandwidth, poor institutional funding attitudes and limited search skills, with a cluster mean of 3.20 (SD = 0.60). The proposed improvement strategies were rated appropriate, with a cluster mean of 3.14 (SD = 0.65). No significant gender difference was found in the perceived role of online information resources ($t = -0.388$, $p = .698$) or in the rating of improvement strategies ($t = 0.094$, $p = .925$), but a significant gender difference was observed in respect of the challenges to utilization ($p = .043$). Online information resources are indispensable to scholarly research, but their benefits are constrained by weaknesses in ICT infrastructure and institutional support. The study recommends improved internet connectivity and bandwidth, stable electricity supply, increased funding for electronic resources, expanded database subscriptions, and regular information literacy and digital skills training for postgraduate students.

## Introduction

The rapid advancement of digital technologies has significantly altered the scholarly communication landscape. The internet and related technologies have enabled universities and libraries to provide access to extensive collections of electronic information resources, including online journals, e-books, institutional repositories, bibliographic databases, conference proceedings and digital archives. These online information resources (OIRs) have become fundamental to academic research because they offer immediate access to the current and authoritative information required for scholarly inquiry (Ajuwon, 2015; IFLA, 2022). Libraries themselves have been reshaped in the process, moving from custodians of print collections to managers of an evolving digital information landscape shaped by funding constraints, rapid technological change, shifting patron needs and copyright considerations (Eromosele & Obande, 2026).

Universities are established to promote teaching, research and the advancement of knowledge (Federal Republic of Nigeria, 2014). Research remains one of the major indicators of academic excellence and institutional relevance, enabling the discovery of new knowledge, the development of innovative solutions and the advancement of society through evidence-based findings (Eteng-Uket & Effiom, 2024; Pawar, 2020). For postgraduate students, scholarly research is central to their academic programmes, since the successful completion of theses and dissertations is a key requirement for degree attainment (Anyakora, Farinmade, & Odimegwu, 2024).

Online information resources enhance scholarly research by providing access to current literature, research findings, theoretical frameworks and methodological approaches. Resources such as JSTOR, ProQuest, Scopus, ScienceDirect, institutional repositories and open-access databases enable researchers to conduct comprehensive literature reviews, identify research gaps and obtain relevant scholarly evidence (Ogunode & Ade, 2023). Faga and Ihuman (2024) emphasised that OIRs have become indispensable components of academic research because they provide diverse sources of information that improve learning and knowledge production. More recently, artificial intelligence research tools have begun to extend these capabilities further by supporting large-scale data analysis, pattern identification and the generation of research insights in academic institutions (Obande, Arikawe, & Ado, 2024).

Library and Information Science (LIS) postgraduate students are expected to be among the most active users of OIRs because of their academic training and professional orientation towards information management. Through effective utilization of these resources, students can enhance the quality of their research outputs, strengthen analytical skills and contribute meaningfully to knowledge creation (Ogunode & Ade, 2023). Scholarly research supported by quality online information resources also promotes critical thinking, research proficiency and informed decision-making (Lamberti, Kluyts, & De Klerk, 2024).

Despite these benefits, the utilization of online information resources in Nigerian universities is confronted by several challenges. Studies have identified inadequate internet connectivity, unstable power supply, limited digital infrastructure, insufficient user skills and poor awareness as major barriers to effective utilization (Osinulu, 2020; Uwandu, 2022). Obande, Osakwe, Ujakpa, Iyawa, Ikechukwu and Amunkete (2020) surveyed 379 university users in Nasarawa State and found that although students were aware of e-journals, e-newspapers and e-books, and although internet services and online databases were available, poor internet connectivity and staff indifference limited effective use. Similar constraints on availability, awareness and use were reported among registered library users in Federal University Lafia and Nasarawa State University Keffi (Obande & Abdulsalami, 2020). Ogunode and Ade (2023) further reported disparities in technological infrastructure across institutions, while Okogwu and Achebe (2018) highlighted issues relating to data costs and device compatibility. Obande and Emmanuel (2024) observed that e-library provision in higher educational institutions in developing countries remains constrained by infrastructural and institutional weaknesses, a situation that limits the returns universities obtain on their investment in electronic resources.

The persistence of these challenges raises concerns about the effectiveness of OIRs in supporting scholarly research among postgraduate students. Since LIS postgraduate students are future information professionals expected to champion digital information use, understanding how OIRs enhance research and identifying the barriers to their effective utilization is essential. Such understanding can guide universities and libraries in improving the access, infrastructure and user-support systems necessary for quality scholarly research in South-West Nigeria.

**Statement of the Problem**

Universities increasingly invest substantial resources in acquiring and maintaining access to online information resources. These investments are intended to improve teaching, learning and research outcomes by providing users with timely access to quality scholarly information. Despite these investments, many postgraduate students continue to encounter difficulties in utilizing the resources available to them. Challenges relating to infrastructure, internet access, digital competencies and resource accessibility often limit the extent to which students benefit from electronic information systems (Obande & Ayongo, 2024; Obande & Emmanuel, 2024).

For Library and Information Science postgraduate students, whose academic activities depend heavily on information access and retrieval, such limitations may negatively affect research quality, productivity and scholarly output. There is therefore a need to examine both the contributions of online information resources to scholarly research and the factors that hinder their effective utilization, and to establish whether these experiences differ by gender.

**Objectives of the Study**

The study sought to:

- Examine the role of online information resources in enhancing scholarly research among Library and Information Science postgraduate students in South-West Nigeria;
- Identify the challenges affecting the utilization of online information resources among Library and Information Science postgraduate students; and
- Suggest strategies for improving the utilization of online information resources for scholarly research by LIS postgraduate students in universities in South-West Nigeria.

**Research Questions**

The following research questions guided the study:

1. What role do online information resources play in enhancing scholarly research among LIS postgraduate students in universities in South-West Nigeria?
2. What challenges affect the utilization of online information resources among LIS postgraduate students in universities in South-West Nigeria?
3. What strategies can improve the utilization of online information resources for scholarly research among LIS postgraduate students in universities in South-West Nigeria?

**Hypotheses**

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

**Ho1:** There is no significant difference between the mean ratings of male and female LIS postgraduate students on the role of online information resources in enhancing scholarly research.

**Ho2:** There is no significant difference between the mean ratings of male and female LIS postgraduate students on the challenges affecting the utilization of online information resources.

**Ho3:** There is no significant difference between the mean ratings of male and female LIS postgraduate students on the strategies for improving the utilization of online information resources.

**Literature Review**

**Online Information Resources**

Online information resources are indispensable to university libraries because they provide print, non-print, electronic and web-based materials that support teaching, learning and research (Okoro & Ojo, 2022). They include digitised print resources such as e-books, e-journals, digital newspapers and government publications (Anderson & Lee, 2018; Nguyen & Brown, 2021; Smith & Johnson, 2021; Wang & Li, 2020), as well as born-digital resources such as audio materials, videos, databases, repositories, social media, blogs and interactive learning platforms (Garcia, Chen, & Lee, 2020; Thompson & Green, 2022; Wright & Taylor, 2021). These resources improve access to current, credible and diverse scholarly information while supporting efficient information retrieval and academic productivity (Li & Kumar, 2019; Morris & Chen, 2020; Patel & Jones, 2018). They also reduce geographical and financial barriers to knowledge and promote inclusive research through open access and digital technologies (Mbogo & Adeyemi, 2019; Rodriguez & Kim, 2020).

Advances in information and communication technology have transformed libraries into hybrid systems providing both physical and electronic resources accessible at any time and from any location (Garcia & Lee, 2018). Electronic information resources in this sense include e-books, e-journals, online databases, CD-ROMs and digital reference materials accessed through internet-enabled devices (Anyim, 2018; Okogwu & Achebe, 2018). Their availability and utilization depend on internet connectivity, computer access and users' digital competencies (Ani & Edem, 2019; Obande & Abdulsalami, 2020).

Sustaining these resources over time is itself a professional task. Obande, Emmanuel and Tsenongu (2024) observe that libraries and archives rely on digital preservation strategies such as migration and emulation to ensure the longevity and continued accessibility of digital content, which is a precondition for the reliability of the resources on which researchers depend. Researchers increasingly rely on online resources because they provide accurate, timely and globally accessible information for

scholarly work (Abubakar, 2020), but effective utilization requires strong information retrieval skills to locate, evaluate and apply relevant information (Onyema, 2020). The open science movement has further widened access to scholarly materials in multiple digital formats, facilitating knowledge creation and dissemination. Ultimately, the availability, accessibility and effective utilization of online information resources significantly enhance postgraduate research quality, innovation and the timely completion of academic work (Ogunode & Ade, 2023).

**Scholarly Research**

Scholarly research refers to systematic academic investigation conducted to generate new knowledge and address societal problems (Ajiboye, Bokoh, Bello, & Idowu, 2023). It is a rigorous and organised process aimed at understanding phenomena, establishing facts and contributing to existing knowledge through scientific inquiry (Ogunode, Onyekachi, & Ayoko, 2023; Saunders, Lewis, & Thornhill, 2017). The scientific method involves hypothesis formulation, data collection, analysis and interpretation using qualitative, quantitative or mixed methods. Scholarly research is characterised by originality, peer review, academic rigour and the use of appropriate methodologies, and typically contains a clearly defined research problem, a literature review, findings presented in tables and figures, and scholarly language (Ogunode & Ade, 2023). It advances knowledge and strengthens critical thinking, analytical skills and research competence (Odede & Zawedde, 2018), while also supporting evidence-based decision-making, innovation and policy formulation.

In postgraduate education, research culminates in master's theses and doctoral dissertations that demonstrate students' contributions to knowledge and reflect institutional research capacity (Anyakora et al., 2024). Universities gain academic recognition through the quality of research produced by their postgraduate students (Obateru, 2022). Such research requires current, credible and peer-reviewed literature to ensure reliability and academic integrity (Pawar, 2020), and peer-reviewed journals remain the primary channels for disseminating authentic scholarly findings. Postgraduate students in Library and Information Science are particularly expected to produce research that addresses professional and societal challenges, and such research depends on the effective use of authentic print, electronic and online information resources for literature review, data interpretation and the validation of findings. Online information resources available through university libraries and repositories are therefore indispensable to high-quality scholarly research (Ogunode & Ade, 2023).

**Challenges Affecting the Utilization of Online Information Resources**

Several studies have identified barriers to the effective utilization of online information resources by postgraduate students, leading to their underutilization (Okunoye, 2022). Major challenges include poor ICT infrastructure, inadequate computers, weak internet connectivity and limited access to online resources (Omeluzor, Madukoma, Bamidele, & Ogbuiyi, 2012). Frequent power outages, lack of personal computers, inadequate user guidance and unpaid database subscriptions further hinder access (Oriogu, Ogbuiyi, & Ogbuiyi, 2014). Faculty members face comparable difficulties, including access charges, slow internet, inadequate guidance and limited searching skills (Kwafoa, Osman, & Afful-Arthur, 2014). Limited computer terminals, poor IT knowledge, lack of library staff support and network failures have also been identified (Alhassan & Macaulay, 2015), alongside poor library infrastructure, inadequate reading spaces and insufficient information literacy skills (Musa & Bello, 2021).

Obande and Ayongo (2024), in a study of postgraduate students in universities in Benue State, examined perceptions of, and challenges in, accessing available electronic information resources, and reported that access difficulties persist even where resources have been acquired. This distinction between availability and accessibility is important, because it indicates that acquisition alone does not guarantee use. Obande and Emmanuel (2024) reach a similar conclusion in their assessment of e-library provision in higher educational institutions in developing countries, where infrastructural, financial and human-capacity constraints combine to limit service delivery.

Despite substantial investment in online resources, utilization remains below expectations in many university libraries (Kwadzo, 2018). Constraints such as irrelevant online resources, inconsistent internet connectivity and limited computer skills continue to impede effective usage (Edem & Egbe, 2016). Other barriers include limited database subscriptions, password restrictions, poor information packaging, lack of time and restricted accessibility (Prasad & Singh, 2009). Unstable electricity, inadequate ICT facilities and insufficient functional computers further affect research activities (Anyim, 2019), while a lack of

subscriptions in relevant disciplines and inadequate staff orientation deprive students of essential scholarly information (Ternenge & Kashimana, 2019). Budget constraints, outdated ICT infrastructure, staff shortages and high subscription costs compound the problem (Lefuna, 2017; Osinulu, 2020). These interconnected challenges significantly hinder the effective utilization of online information resources and underscore the need for interventions to improve their accessibility and use for scholarly research in Nigerian universities (Joel, 2020).

**Strategies for Enhancing Utilization**

Several authors have proposed strategies for improving the utilization of online information resources among postgraduate students by addressing the identified barriers. Key recommendations include ensuring the adequate availability of print and electronic resources, improving access, enhancing library funding and strengthening ICT infrastructure (Bassi, Mamza, & Filiyaro, 2023). Creating a conducive library environment and equipping librarians with relevant ICT and instructional skills can also promote greater utilization (Muhammad-Rabiu, 2019). Institutional challenges such as weak governance, inadequate funding and limited financial transparency must be addressed to improve the acquisition and sustainability of online resources (National Universities Commission [NUC], 2024).

Subscription to relevant online databases, regular awareness workshops and the provision of alternative power sources have been recommended to enhance effective use (Uwandu, 2022). Library management should intensify awareness campaigns through seminars, workshops, public relations activities and effective communication with users, and should regularly update collections while withdrawing obsolete resources (Okunoye, 2022). Improving accessibility through increased storage capacity, adequate staffing and collaborative acquisition can further enhance utilization (Aboki & Lakan, 2023), while proper orientation programmes and user-centred services encourage effective use (Anyim, 2021). Sustainable funding, direct government allocation to libraries and income-generating initiatives have also been suggested (Nwankwo, Ismaila, Seimode, & Eda, 2020), as have the continuous training and retraining of library personnel to keep pace with emerging technologies (Aju & Foti, 2020). The provision of adequate ICT facilities, decentralised services, effective marketing of library resources and staff development constitute additional strategies (Saibakumo, 2021). Attention to the long-term preservation of digital content is equally necessary if resources acquired today are to remain accessible to future researchers (Obande, Emmanuel, & Tsenongu, 2024).

Taken together, these strategies identify availability, awareness, ICT proficiency and utilization as the key variables influencing the use of online information resources among postgraduate students. Awareness precedes utilization, and ICT competence enhances effective access; implementing the strategies above is therefore expected to improve awareness, ICT proficiency and the effective utilization of online information resources for scholarly research.

**Empirical Studies**

Ojo and Akande (2021) found that postgraduate students who had received formal ICT training exhibited greater confidence in searching, evaluating and retrieving scholarly information, whereas those with limited digital skills relied mainly on general search engines rather than academic databases. Agyekum and Filson (2020) reported that many postgraduate students lacked advanced online research skills such as Boolean searching, citation tracking and metadata utilization. Ani and Edem (2019) revealed that although awareness of online information resources was high, actual utilization remained moderate because of weak search, evaluation and citation-management skills. Mhlongo and Bopape (2020) observed that postgraduate students frequently used online platforms but lacked adequate competence in filtering and evaluating scholarly information, highlighting the need for digital research skills training.

Obande et al. (2020) investigated the awareness, accessibility and usability of electronic resources among 379 university users in Nasarawa State, Nigeria, and found that students were aware of the e-journals, e-newspapers and e-books available to them and that internet services and online databases were provided, yet poor internet connectivity and staff indifference constrained use. Obande and Abdulsalami (2020) reported a comparable pattern of availability, awareness and use among registered library users in Federal University Lafia and Nasarawa State University Keffi. Extending this line of inquiry to postgraduate users, Obande and Ayongo (2024) examined perceptions of and challenges in accessing available electronic information resources among postgraduate students in universities in

Benue State, Nigeria. These studies are directly relevant to the present research because they establish that awareness of electronic resources is generally high in Nigerian universities while effective use remains constrained by infrastructure and support factors.

Obasuyi and Salubi (2021) established that access to well-equipped digital libraries and proactive librarian support significantly enhanced students' online proficiency and utilization of electronic resources, while Yakubu and Adamu (2020) found that although younger postgraduate students were generally more comfortable with online platforms, this comfort did not necessarily translate into more effective research practices.

Across the reviewed studies, ICT competence, digital literacy and information retrieval skills consistently emerge as major determinants of the effective utilization of online information resources, and digital infrastructure, library support services and user training emerge as the principal enabling conditions. Most of these studies focused on postgraduate students and shared variables with the present study, but differed in geographical scope, research design and, in several cases, the inclusion of gender as a moderating variable. Notably, none was conducted among Library and Information Science postgraduate students in South-West Nigeria, and few tested for gender differences. These differences justify the present study.

**Methodology**

This study adopted a descriptive survey design to investigate the role of online information resources in scholarly research and the challenges of their utilization among Library and Information Science postgraduate students in selected federal, state and private universities across the six states of South-West Nigeria. The population comprised 324 LIS postgraduate students (114 males and 210 females). Because the population was of manageable size, the entire population was studied and no sampling was carried out.

Data were collected using a self-developed instrument, the Online Information Resources for Scholarly Research Questionnaire (OIRSRQ), supported by an observation checklist. The questionnaire covered awareness of online information resources, extent of use, ICT proficiency, the role of online resources in scholarly research, challenges to utilization, and strategies for improvement. Items were structured on a four-point rating scale.

The instruments were face-validated by three experts in Library and Information Science and Measurement and Evaluation, and were pilot-tested on a comparable group of postgraduate students outside the study area. Cronbach's alpha coefficients for the clusters ranged from 0.70 to 0.86, with an overall reliability coefficient of 0.89, indicating that the instrument was reliable.

Data were analysed using SPSS version 27. Research questions were answered using means and standard deviations, with a criterion mean of 2.50 for acceptance. The real limits of numbers were applied in interpreting the mean scores: 3.50–4.00 (very high extent / strongly agree), 2.50–3.49 (high extent / agree), 1.50–2.49 (low extent / disagree) and 1.00–1.49 (very low extent / strongly disagree). The three null hypotheses were tested using independent samples t-tests at the 0.05 level of significance.

**Results**

**Research Question 1**

*What role do online information resources play in enhancing scholarly research among LIS postgraduate students in universities in South-West Nigeria?*

**Table 1.** Mean responses on the role of online information resources in enhancing scholarly research among LIS postgraduate students

| S/N | Item | Male Mean | Male SD | Female Mean | Female SD | Overall Mean | Overall SD | Decision |
|---|---|---|---|---|---|---|---|---|
| 1 | Provides access to scholarly materials | 3.63 | 0.62 | 3.67 | 0.53 | 3.66 | 0.56 | VHE |
| 2 | Provides access to global research | 3.56 | 0.68 | 3.51 | 0.75 | 3.52 | 0.73 | VHE |
| 3 | Offers convenience and flexibility | 3.34 | 0.84 | 3.27 | 0.97 | 3.29 | 0.93 | HE |

| S/N | Item | Male Mean | Male SD | Female Mean | Female SD | Overall Mean | Overall SD | Decision |
|---|---|---|---|---|---|---|---|---|
| 4 | Saves time in locating relevant materials | 3.25 | 0.90 | 3.31 | 0.86 | 3.29 | 0.87 | HE |
| 5 | Gives access to current research | 3.44 | 0.67 | 3.42 | 0.70 | 3.43 | 0.69 | HE |
| 6 | Helps in identifying research gaps | 3.35 | 0.73 | 3.30 | 0.84 | 3.31 | 0.80 | HE |
| 7 | Enhances research collaboration | 3.16 | 0.88 | 3.36 | 0.78 | 3.28 | 0.82 | HE |
| 8 | Is cost effective | 3.38 | 0.74 | 3.26 | 0.96 | 3.30 | 0.89 | HE |
| 9 | Provides analytical tools that aid understanding and presentation of data | 3.41 | 0.77 | 3.45 | 0.82 | 3.44 | 0.80 | HE |
| 10 | Improves citation and reference management | 3.42 | 0.75 | 3.38 | 0.88 | 3.39 | 0.84 | HE |
| 11 | Encourages the use of multimedia tools such as video and podcasts | 3.27 | 0.96 | 3.32 | 0.92 | 3.30 | 0.93 | HE |
| 12 | Enables interactive learning | 3.32 | 0.86 | 3.48 | 0.77 | 3.43 | 0.81 | HE |
| 13 | Supports interdisciplinary research | 3.39 | 0.72 | 3.47 | 0.72 | 3.45 | 0.72 | HE |
| | **Cluster mean** | **3.38** | **0.88** | **3.40** | **0.61** | **3.39** | **0.70** | **HE** |

*Note.* VHE = very high extent; HE = high extent; LE = low extent; VLE = very low extent.

Table 1 shows that online information resources enhance the scholarly research of LIS postgraduate students to a very high extent in two respects: providing access to scholarly materials (M = 3.66, SD = 0.56) and providing access to global research (M = 3.52, SD = 0.73), both of which fall within the real limit of 3.50–4.00. The remaining eleven items fall within the real limit of 2.50–3.49 and are therefore rated as contributing to a high extent. These are support for interdisciplinary research (M = 3.45, SD = 0.72), provision of analytical tools (M = 3.44, SD = 0.80), access to current research (M = 3.43, SD = 0.69), interactive learning (M = 3.43, SD = 0.81), improved citation and reference management (M = 3.39, SD = 0.84), identification of research gaps (M = 3.31, SD = 0.80), cost effectiveness (M = 3.30, SD = 0.89), the use of multimedia tools (M = 3.30, SD = 0.93), convenience and flexibility (M = 3.29, SD = 0.93), time saving (M = 3.29, SD = 0.87) and enhanced research collaboration (M = 3.28, SD = 0.82).

The cluster mean of 3.39 falls within the real limit of 2.50–3.49, indicating that online information resources facilitate the scholarly research of LIS postgraduate students to a high extent overall. Standard deviations for the thirteen items range from 0.56 to 0.93, indicating that respondents were homogeneous in their responses.

**Research Question 2**

*What challenges affect the utilization of online information resources among LIS postgraduate students in universities in South-West Nigeria?*

**Table 2.** Mean responses on the challenges hindering postgraduate students' utilization of online information resources for scholarly research

| S/N | Item | Male Mean | Male SD | Female Mean | Female SD | Overall Mean | Overall SD | Decision |
|---|---|---|---|---|---|---|---|---|
| 1 | Lack of or inadequate computers | 2.99 | 1.01 | 3.05 | 0.97 | 3.03 | 0.98 | A |
| 2 | High cost of internet connectivity | 3.00 | 1.04 | 2.88 | 1.02 | 2.92 | 1.03 | A |
| 3 | Non-payment of subscriptions | 3.03 | 1.09 | 2.92 | 1.11 | 2.95 | 1.10 | A |
| 4 | Lack of knowledge on the use of online resources | 3.38 | 0.81 | 3.23 | 0.93 | 3.28 | 0.89 | A |
| 5 | Inadequate or poor information search skills | 3.37 | 0.79 | 3.20 | 0.83 | 3.26 | 0.82 | A |
| 6 | Slow loading and blockage of websites | 3.55 | 0.62 | 3.56 | 0.67 | 3.55 | 0.65 | SA |
| 7 | Improper guidance on the use of online resources | 3.38 | 0.83 | 3.38 | 0.84 | 3.38 | 0.83 | A |
| 8 | Insufficient bandwidth | 3.36 | 0.75 | 3.33 | 0.82 | 3.34 | 0.80 | A |
| 9 | Poor level of computer literacy | 3.26 | 0.98 | 3.03 | 1.10 | 3.11 | 1.06 | A |
| 10 | Constant power outages | 3.03 | 1.11 | 3.03 | 1.02 | 3.03 | 1.05 | A |
| 11 | Non-availability of internet facilities | 3.30 | 0.85 | 3.24 | 0.82 | 3.26 | 0.83 | A |
| 12 | Poor attitude of university management to funding online resources | 3.37 | 0.72 | 3.33 | 0.70 | 3.34 | 0.71 | A |
| | **Cluster mean** | **3.25** | **0.70** | **3.18** | **0.87** | **3.20** | **0.60** | **A** |

*Note.* SA = strongly agree; A = agree; D = disagree; SD = strongly disagree.

Table 2 presents the mean ratings of the factors constituting challenges to the effective utilization of online information resources. Applying the criterion mean of 2.50, all twelve items were accepted as challenges. The most strongly rated challenge was slow loading and the blockage of websites (M = 3.55, SD = 0.65), which falls within the real limit of 3.50–4.00, followed by improper guidance on the use of online resources (M = 3.38, SD = 0.83), insufficient bandwidth (M = 3.34, SD = 0.80), the poor attitude of university management towards funding online resources (M = 3.34, SD = 0.71) and lack of knowledge on the use of online resources (M = 3.28, SD = 0.89). The lowest-rated, though still accepted, challenges were the high cost of internet connectivity (M = 2.92, SD = 1.03) and the non-payment of subscriptions (M = 2.95, SD = 1.10).

The cluster mean of 3.20 indicates that respondents agreed in aggregate that these items constitute challenges to the effective utilization of online information resources. Standard deviations ranged from 0.65 to 1.10, indicating homogeneity of responses.

**Research Question 3**

*What strategies can improve the utilization of online information resources for scholarly research among LIS postgraduate students in universities in South-West Nigeria?*

**Table 3.** Mean responses on strategies for improving the utilization of online information resources for scholarly research by LIS postgraduate students in universities in South-West Nigeria

| S/N | Item | Male Mean | Male SD | Female Mean | Female SD | Overall Mean | Overall SD | Decision |
|---|---|---|---|---|---|---|---|---|
| 1 | Provision of adequate computers | 3.23 | 0.86 | 3.30 | 0.78 | 3.28 | 0.81 | A |
| 2 | Institutional subscription to internet connectivity | 3.26 | 0.85 | 3.14 | 0.86 | 3.18 | 0.86 | A |
| 3 | Consistent payment of subscriptions to online resource vendors | 3.23 | 0.87 | 3.19 | 0.83 | 3.20 | 0.84 | A |
| 4 | User education on how to use online resources | 2.83 | 1.05 | 2.75 | 1.05 | 2.78 | 1.05 | A |
| 5 | Organisation of workshops to impart search skills | 3.29 | 0.93 | 3.26 | 0.95 | 3.27 | 0.94 | A |
| 6 | Upgrading of internet connectivity and websites | 3.44 | 0.76 | 3.36 | 0.92 | 3.39 | 0.87 | A |
| 7 | Proper guidance on the use of online information resources | 3.21 | 1.07 | 3.10 | 1.12 | 3.14 | 1.11 | A |
| 8 | Provision of sufficient internet bandwidth | 3.33 | 0.85 | 3.17 | 0.90 | 3.22 | 0.89 | A |
| 9 | Provision of computer literacy training for postgraduates | 3.07 | 0.99 | 3.18 | 0.92 | 3.14 | 0.94 | A |
| 10 | Provision of alternative power supply | 3.17 | 1.05 | 3.22 | 0.97 | 3.21 | 1.00 | A |
| 11 | Provision of constant internet facilities | 2.74 | 1.11 | 2.86 | 1.10 | 2.82 | 1.11 | A |
| 12 | Positive institutional attitude to funding online resources in the library | 3.14 | 0.99 | 2.99 | 1.04 | 3.04 | 1.02 | A |
| | **Cluster mean** | **3.16** | **0.50** | **3.12** | **0.79** | **3.14** | **0.65** | **A** |

*Note.* VA = very appropriate; A = appropriate; LA = less appropriate; NA = not appropriate.

Table 3 shows that all twelve proposed strategies were rated as appropriate, since each exceeds the criterion mean of 2.50. The highest-rated strategies were the upgrading of internet connectivity and websites (M = 3.39, SD = 0.87), the provision of adequate computers (M = 3.28, SD = 0.81), the organisation of workshops to impart search skills (M = 3.27, SD = 0.94), the provision of sufficient internet bandwidth (M = 3.22, SD = 0.89) and the provision of an alternative power supply (M = 3.21, SD = 1.00). Lower-rated but still accepted strategies included the provision of constant internet facilities (M = 2.82, SD = 1.11) and user education on how to use online resources (M = 2.78, SD = 1.05). The cluster mean of 3.14 (SD = 0.65) indicates overall agreement that the listed strategies are appropriate for improving the utilization of online information resources for scholarly research.

**Test of Hypotheses**

**Table 4.** Independent samples t-test of male and female respondents' mean ratings

| Variable | Gender | N | Mean | SD | t | p | Decision |
|---|---|---|---|---|---|---|---|
| Role of online information resources | Male | 114 | 3.38 | 0.88 | -0.388 | .698 | Not significant |
| | Female | 210 | 3.40 | 0.61 | | | |
| Challenges to utilization | Male | 114 | 3.25 | 0.70 | — | .043 | Significant |
| | Female | 210 | 3.18 | 0.87 | | | |
| Strategies for improvement | Male | 114 | 3.16 | 0.50 | 0.094 | .925 | Not significant |
| | Female | 210 | 3.12 | 0.79 | | | |

*Note.* df = 322; significance determined at p < .05.

Table 4 shows that the difference between male and female respondents in their rating of the role of online information resources was not statistically significant (t = -0.388, p = .698). Hypothesis one was therefore not rejected. Similarly, the difference in the rating of improvement strategies was not statistically significant (t = 0.094, p = .925), and hypothesis three was not rejected. However, the difference between male and female respondents in respect of the challenges affecting utilization was statistically significant (p = .043), and hypothesis two was therefore rejected: male respondents (M = 3.25) reported the challenges more strongly than female respondents (M = 3.18).

**Discussion of Findings**

**Role of Online Information Resources in Enhancing Scholarly Research**

The findings show that online information resources play a significant role in enhancing scholarly research among LIS postgraduate students. Respondents rated access to scholarly materials and access to global research most highly, and also affirmed that these resources support interdisciplinary research, provide analytical tools, give access to current literature, improve citation and reference management, aid the identification of research gaps and facilitate research collaboration. This finding aligns with Ogunode and Ade (2023) and Faga and Ihuman (2024), who reported that online information resources are indispensable to academic research because they widen the range of accessible scholarly evidence. It also supports Ajuwon (2015) and Abubakar (2020), who emphasised the value of timely and globally accessible information for scholarly work.

The prominence of access-related items is consistent with Obande et al. (2020), who found high awareness and availability of e-journals, e-newspapers, e-books and online databases among Nigerian university users. The present finding extends that evidence to postgraduate LIS students in South-West Nigeria and demonstrates that awareness and perceived usefulness remain high across institutional types. The result also lends support to the observation of Obande, Arikawe and Ado (2024) that digital and artificial intelligence research tools are increasingly central to the productivity of academic work.

**Challenges Affecting Utilization**

The study identified slow loading and blockage of websites, improper guidance on the use of online resources, insufficient bandwidth, the poor funding attitude of university management, limited knowledge of online resources and weak search skills as the principal challenges to utilization. These findings corroborate Osinulu (2020), Uwandu (2022) and Anyim (2019), who identified poor internet connectivity, unstable electricity and inadequate ICT facilities as persistent barriers in Nigerian university libraries.

The results are also consistent with Obande and Ayongo (2024), whose study of postgraduate students in Benue State distinguished between the availability of electronic information resources and students' actual ability to access them, and with Obande and Emmanuel (2024), who attributed the limited effectiveness of e-library services in developing countries to infrastructural and institutional weaknesses. The finding that connectivity-related items were rated more highly than cost-related items suggests that the constraint in the present context is less the acquisition of resources than the technical environment through which they are delivered. This echoes Obande et al. (2020), who reported poor connectivity and staff indifference despite the availability of resources, and Kwadzo (2018), who noted that utilization remains below expectation despite substantial institutional investment.

The significant gender difference in the perception of challenges ($p = .043$) is a noteworthy finding. Male respondents reported the challenges more strongly than their female counterparts, which may reflect differences in patterns and intensity of use rather than differences in the barriers themselves. Yakubu and Adamu (2020) similarly observed that demographic characteristics influence online research behaviour without necessarily determining research effectiveness.

**Strategies for Improvement**

Respondents endorsed all the proposed strategies, rating most highly the upgrading of internet connectivity and websites, the provision of adequate computers, workshops on search skills, sufficient bandwidth and alternative power supply. These priorities mirror the recommendations of Bassi, Mamza and Filiyaro (2023) on strengthening ICT infrastructure and library funding, and of Uwandu (2022) on database subscriptions, awareness workshops and alternative power. The high rating of training-related strategies is consistent with Ojo and Akande (2021), Agyekum and Filson (2020) and Mhlongo and Bopape (2020), all of whom found formal ICT and information-literacy training to be a determinant of effective resource use.

The endorsement of infrastructure and preservation-oriented investment further supports Obande, Emmanuel and Tsenongu (2024), who argue that the longevity and continued accessibility of digital content depend on deliberate institutional strategies rather than on acquisition alone. Similarly, the emphasis respondents placed on institutional funding attitudes reflects the governance and funding concerns identified by the NUC (2024) and by Eromosele and Obande (2026) in their account of the pressures facing contemporary libraries.

**Conclusion**

The study established that online information resources make a substantial contribution to scholarly research among Library and Information Science postgraduate students in South-West Nigeria. These resources enhance access to scholarly and global literature, improve research quality, support academic writing and referencing, and facilitate scholarly collaboration and interdisciplinary inquiry. However, challenges such as slow and unreliable website access, insufficient bandwidth, inadequate user guidance, limited digital competencies, unstable electricity and weak institutional funding continue to constrain effective utilization. Male and female students did not differ significantly in their assessment of the role of online information resources or of improvement strategies, but they differed significantly in their perception of the challenges to utilization. Addressing these constraints is essential if universities are to realise the full return on their investment in electronic information resources.

**Recommendations**

Based on the findings, the study recommends that:

4. Universities should improve internet connectivity and bandwidth capacity, with particular attention to website loading speed and access restrictions;
5. Government and institutional authorities should invest in stable power infrastructure and alternative power supply for library facilities;
6. Academic libraries should expand and consistently renew subscriptions to relevant electronic databases;
7. Regular information literacy and digital competency training programmes should be organised for postgraduate students, with emphasis on advanced search techniques, source evaluation and citation management;
8. Universities should provide modern ict facilities and responsive technical support services;
9. Librarians should intensify user guidance, orientation and promotion of available online information resources;
10. Institutions should encourage the use of open-access resources to complement subscription databases; and increased and sustained funding should be allocated to digital library development, electronic resource acquisition and digital preservation.

**References**

1. Aboki, Z. P., & Lakan, L. E. (2023). *Availability and accessibility of ICTs in teaching by lecturers of Federal University, Wukari, Taraba State*.

2. Abubakar, J. D. (2020). Availability and accessibility of information resources in university libraries for students' academic use: A case study of pharmaceutical science students of the University of Jos. *Library Philosophy and Practice*, 4231.

3. Agyekum, B. O., & Filson, C. K. (2020). Digital literacy and the use of e-resources by postgraduate students in Ghanaian universities. *Library Philosophy and Practice*, *20*, 1–18.

4. Ajiboye, B. A., Bokoh, M. A., Bello, M. M., & Idowu, A. A. (2023). Influence of library resources and services on research activities among postgraduate students of south-west federal universities, Nigeria. *American Journal of Information Science and Technology*, *7*(1), 1–8. https://doi.org/10.11648/j.ajist.20230701.11

5. Aju, D. T., & Foti, S. T. (2020). Undergraduates' awareness, utilization and satisfaction with online public access catalogue (OPAC) in public university libraries in Nasarawa State, Nigeria. *Library and Information Perspectives and Research*, *2*(1), 18–29.

6. Ajuwon, G. A. (2015). Internet accessibility and use of online health information resources by doctors in training healthcare institutions in Nigeria. *Library Philosophy and Practice (e-journal)*, 1258. University of Nebraska–Lincoln.

7. Alhassan, J. A., & Macaulay, S. O. (2015). Availability and utilization of electronic resources by university students in Niger State. *International Conference on 21st Century Education*, *7*(1), 10–19.

8. Anderson, J., & Lee, C. (2018). Access and use of government publications in digital format: A user perspective. *Government Information Quarterly*, *35*(4), 522–531.

9. Ani, O. E., & Edem, M. B. (2019). ICT literacy and utilization of electronic information resources by postgraduate students in the University of Calabar, Nigeria. *Information Impact: Journal of Information and Knowledge Management*, *10*(2), 55–69.

10. Anyakora, M. I., Farinmade, A., & Odimegwu, C. N. (2024). Research methodology teaching and learning approaches, thesis writing skills, and effective completion of academic theses among postgraduate students in Nigerian universities. *Niger Delta Journal of Library and Information Science*, *3*(12), 20–40.

11. Anyim, W. O. (2018). E-library resources and services: Improvement and innovation of access and retrieval for effective research activities in university e-libraries in Kogi State, Nigeria. *Library Philosophy and Practice (e-journal)*, 1647. https://digitalcommons.unl.edu/libphilprac/1647

12. Anyim, W. O. (2019). Electronic information resources for learning and research activities among undergraduate students in the university library. *Journal of Computer Science and Technology Studies*, *1*(1), 28–35.

13. Anyim, W. O. (2021). Perception of library users on the use of ICT facilities in Abia State Polytechnic Library, Nigeria. *International Journal of Marketing and Human Resource Research*, *2*(3), 169–177.

14. Bassi, M. D., Mamza, W. P., & Filiyaro, R. (2023). A comparative analysis of ICT proficiency possessed among the federal university library staff in North-East Nigeria. *International Journal of Library and Information Science Studies*, *9*(5), 1–17.

15. Edem, N. B., & Egbe, N. (2016). Availability and utilization of electronic information resources by postgraduate students in a Nigerian university library: A case study of University of Calabar, Nigeria. *Information and Knowledge Management*, *6*(2), 60–69.

16. Eromosele, P. O., & Obande, B. O. (2026). The changing face of libraries: Issues and serendipities. *Alexandria: The Journal of National and International Library and Information Issues*. https://doi.org/10.1177/09557490251414711

17. Eteng-Uket, S., & Effiom, E. U. (2024). Evaluation of postgraduate diploma in education programme in the University of Port Harcourt using the CIPP evaluation model. *Journal of Education in Developing Areas*, *31*(5), 119–134.

18. Faga, A., & Ihuman, R. Y. (2024). Awareness and use of electronic information resources by undergraduates in public university libraries in Nigeria. *The Catalyst Journal of Library and Information Literacy*, *3*(1), 56–68.

19. Federal Republic of Nigeria. (2014). *National policy on education* (6th ed.). NERDC Press.

20. Garcia, L., & Lee, S. (2018). The evolution and impact of electronic resources in academic libraries. *Journal of Digital Information*, *19*(3), 45–59.

21. Garcia, L., Chen, P., & Lee, S. (2020). Academic repositories and their impact on research accessibility. *Library Hi Tech*, *38*(2), 285–298.

22. International Federation of Library Associations and Institutions. (2022). *Trends in academic library services: Global perspectives*. https://library.ifla.org/cgi/stats/report

23. Joel, H. (2020). Awareness and purpose of electronic information resources among postgraduate students of library and information science in Borno State. *East African Scholars Journal of Education, Humanities and Literature*, *3*(8), 362–366.

24. Kwadzo, G. (2018). Awareness and usage of electronic databases by geography and resource development information studies graduate students in the University of Ghana. *Library Philosophy and Practice (e-journal)*, 258. http://digitalcommons.unl.edu/libphilprac/258

25. Kwafoa, P. N., Osman, I., & Afful-Arthur, P. (2014). Assessment of the use of electronic resources among administrators and faculty in the University of Cape Coast. *Library Philosophy and Practice*, 1–19.

26. Lamberti, P., Kluyts, M., & De Klerk, D. (2024). Integrating scholarly writing development into postgraduate research programmes: An exploration of enablers and constraints. *South African Journal of Higher Education*, *38*(1), 111–129.

27. Lefuna, S. (2017). *Access to and use of electronic information resources in the academic libraries of the Lesotho Library Consortium*. https://researchspace.ukzn.ac.za

28. Li, X., & Kumar, S. (2019). The role of online databases in scholarly research: Accessibility and reliability. *Information Processing & Management*, *56*(5), 1845–1857.

29. Mbogo, F., & Adeyemi, T. (2019). Challenges and opportunities of digital library access in developing countries. *International Journal of Library and Information Science*, *11*(3), 42–55.

30. Mhlongo, M. C., & Bopape, S. (2020). Evaluating online information literacy among postgraduate students at the University of Limpopo. *South African Journal of Libraries and Information Science*, *86*(1), 1–10.

31. Morris, D., & Chen, J. (2020). Improving research efficiency with digital search technologies. *Library Hi Tech*, *38*(4), 759–774.

32. Muhammad-Rabiu, A. (2019). Librarians' ICT attitude and library policy as correlates for the utilization of ICT-based library consortium in university libraries in North-Central Nigeria. *Library Philosophy and Practice*, *2*, 1–16.

33. Musa, S., & Bello, H. (2021). Training needs of library and information science students in digital literacy: Implications for curriculum development. *Library Philosophy and Practice*, *15*(3), 112–127.

34. National Universities Commission. (2024). *NUC identifies poor governance, funding issues in Nigerian universities*. Vanguard News. https://www.vanguardngr.com/2024/08/nuc-identifies-poor-governance-funding-issues-in-nigerian-universities/

35. Nguyen, T., & Brown, K. (2021). Trends in academic e-journal usage among university students. *Journal of Digital Information*, *22*(1), 33–47.

36. Nwankwo, N. G., Ismaila, O. S., Seimode, D. F., & Eda, R. (2020). Information and communication technology (ICT) in Nigerian libraries for sustainable development goals (SDGs). *Library Philosophy and Practice (e-journal)*, 4474.

37. Obande, B. O., & Abdulsalami, L. T. (2020). Availability, awareness and use of electronic information resources amongst library registered students in Federal University Lafia and Nasarawa State University Keffi. *Direct Research Journal of Engineering and Information Technology*, *7*(6), 97–107.

38. Obande, B. O., & Ayongo, G. (2024). *Perceptions and challenges in accessing available electronic information resources: A case study of postgraduate students in universities in Benue State, Nigeria*. SSRN. https://doi.org/10.2139/ssrn.4756788

39. Obande, B. O., & Emmanuel, H. (2024). *Challenges of e-library in developing countries' higher educational institutions*. SSRN. https://doi.org/10.2139/ssrn.4915748

40. Obande, B. O., Arikawe, A. S., & Ado, M. B. (2024). *Artificial intelligence (AI) research tools to enhance the productivity of academic librarians in higher educational institutions: An overview*. SSRN. https://ssrn.com/abstract=4943782

41. Obande, B. O., Emmanuel, H., & Tsenongu, C. T. (2024). Strategies and technologies employed by libraries and archives to ensure longevity and accessibility to digital content. *Direct Research Journal of Engineering and Information Technology*, *12*(2), 65–70. https://doi.org/10.26765/DRJEIT618753623

42. Obande, B. O., Osakwe, J., Ujakpa, M. M., Iyawa, G., Ikechukwu, A. O., & Amunkete, K. (2020). Awareness, accessibility and usability of e-resources: University students' perspective. In *IST-Africa 2020 Conference Proceedings* (pp. 1–9). IST-Africa Institute and IIMC.

43. Obasuyi, M. O., & Salubi, O. O. (2021). E-resources utilization and online proficiency among postgraduate students in selected Nigerian federal universities. *Library Philosophy and Practice*, 1–20.

44. Obateru, O. T. (2022). Research projects and dissertation writing among Nigerian university students: Perceived difficulty areas and the way out. *Sapientia Foundation Journal of Education, Sciences and Gender Studies*, *4*(1), 141–150.

45. Odede, I. R., & Zawedde, N. (2018). Information literacy skills in using electronic information resources. *Library Philosophy and Practice (e-journal)*, 1947. http://digitalcommons.unl.edu/libphilprac/1947

46. Ogunode, N. J., & Ade, T. I. (2023). Research programme in public universities in Nigeria. *Best Journal of Innovation in Science, Research and Development, 2*(3), 1–13.

47. Ogunode, N. J., Onyekachi, M. C., & Ayoko, V. O. (2023). Investment in university education in Nigeria: Obstacles and possible solutions. *Central Asian Journal of Innovations on Tourism Management and Finance*, *4*(2), 59–66.

48. Ojo, R. A., & Akande, S. O. (2021). Influence of ICT training on utilization of online information resources by postgraduate students in Nigeria. *Journal of Information Science and Technology*, *11*(2), 113–124.

49. Okogwu, F. I., & Achebe, N. E. (2018). *Selection and acquisition of electronic resources in university libraries in South-East Nigeria: Challenges*. Library Philosophy and Practice (e-journal). https://digitalcommons.unl.edu/libphilprac/

50. Okoro, E., & Ojo, T. (2022). Role of information resources in enhancing service delivery in Nigerian university libraries. *International Journal of Library and Information Science*, *14*(1), 25–35.

51. Okunoye, O. (2022). *Assessing level of availability and hindrances to adequacy of ICT facilities for the provision of e-resources services in university libraries in South-West Nigeria*. Library Philosophy and Practice (e-journal), 7146. https://digitalcommons.unl.edu/libphilprac/7146/

52. Omeluzor, S. U., Madukoma, E., Bamidele, I., & Ogbuiyi, S. U. (2012). Use of electronic information resources and research output by academic staff in private universities in Ogun State, Nigeria. *Canadian Social Science*, *8*(3), 8–15.

53. Onyema, E. M. (2020). Integration of emerging technologies in teaching and learning process in Nigeria: The challenges. *Central Asian Journal of Mathematical Theory and Computer Sciences*, *1*(11), 35–39.

54. Oriogu, C. D., Ogbuiyi, S. U., & Ogbuiyi, D. C. (2014). Availability and accessibility of ICT in the provision of information resources to undergraduate students in Babcock University Library. *Research on Humanities and Social Sciences*, *4*(14), 29–33.

55. Osinulu, L. F. (2020). Awareness of use of electronic information resources by students of the College of Health Sciences in Olabisi Onabanjo University, Nigeria. *Information Impact: Journal of Information and Knowledge Management*, *11*(3), 1–11.

56. Patel, R., & Jones, M. (2018). Credibility and curation in academic online resources. *International Journal of Digital Libraries*, *19*(2), 117–129.

57. Pawar, N. (2020). Type of research and type of research design. *Research Methodology*, 46–57.

58. Prasad, H. N., & Singh, P. K. (2009). Measuring awareness and use patterns of online journals and databases: A study of the Faculty of Science, Banaras Hindu University. *ICMR Library Bulletin*, *6*(1), 2–9.

59. Rodriguez, M., & Kim, S. (2020). Global access to academic knowledge: Bridging the digital divide. *Journal of Information Science*, *46*(4), 515–528.

60. Saibakumo, W. T. (2021). Awareness and acceptance of emerging technologies for extended information service delivery in academic libraries in Nigeria. *Library Philosophy and Practice*, 1–11.

61. Saunders, M., Lewis, P., & Thornhill, A. (2017). *Research methods for business students* (7th ed.). Pearson Education.

62. Smith, J., & Johnson, A. (2021). E-books in academic libraries: Usage patterns and challenges. *The Journal of Academic Librarianship*, *47*(2), 101302.

63. Ternenge, T. S., & Kashimana, F. (2019). Availability, accessibility and use of electronic information resources for research by students in Francis Sulemanu Idachaba Library, University of Agriculture, Makurdi. *Library Philosophy and Practice (e-journal)*, 2352, 1–41.

64. Thompson, A., & Green, M. (2022). The rise of educational podcasts: Uses and implications. *Educational Technology*, *62*(3), 45–52.

65. Uwandu, L. I. (2022). *Use of electronic information resources by postgraduate students of the Faculty of Education in Imo State University, Owerri Library*. Library Philosophy and Practice (e-journal), 7442. https://digitalcommons.unl.edu/libphilprac/7442

66. Wang, Y., & Li, F. (2020). The evolution of digital newspapers and magazines in the 21st century. *Journalism Studies*, *21*(5), 602–618.

67. Wright, J., & Taylor, K. (2021). Interactive simulations in STEM education. *Journal of Science Education and Technology*, *30*(3), 369–380.

68. Yakubu, A., & Adamu, I. (2020). Demographic factors and online research skills among Nigerian postgraduate students. *Journal of Digital Learning and Education*, *6*(2), 88–96.