

Information and Communication Technology (ICT) Proficiency and Use of Electronic Library Resources among Distance Learners at the National Open University of Nigeria.

By

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Abstract

This study investigated Information and Communication Technology (ICT) proficiency and the use of Electronic Library Resources (ELRs) among distance learners at the National Open University of Nigeria (NOUN). As digital resources had become central to academic success, students in open and distance learning institutions faced significant barriers, including inconsistent internet access, limited ICT training, and varying proficiency levels. These challenges hindered effective engagement with ELRs, which were critical for research, learning, and academic development. Grounded in the Information Literacy Competency Framework and the Unified Theory of Acceptance and Use of Technology (UTAUT), the study evaluated the impact of internet accessibility, library platform usability, and ICT training programs on ELR utilization. A stratified cluster sampling technique was employed to select 399 respondents from six geopolitical zones. Data were collected through structured questionnaires and analyzed using SPSS version 26. Findings revealed that while most learners perceived internet access and platform usability positively, a significant minority still faced infrastructural challenges. Students generally supported hands-on, practical ICT training, yet participation remained low, and existing programs were often perceived as ineffective. Respondents advocated for integrating ICT skills into the academic curriculum and improving infrastructure across study centres. The study concluded that bridging the digital divide required strategic interventions, including improved internet infrastructure, enhanced ELR platform usability, and the integration of ICT training into the educational system. By addressing these gaps, NOUN could significantly improve learners' academic outcomes and foster digital inclusion. The study recommended policy development, infrastructure investment, and capacity-building initiatives to enhance digital literacy and ELR utilization, thereby advancing technology integration in distance education, particularly within developing countries.

Keywords: Information and Communication Technology (ICT), Electronic Library Resource, Use, Distance Learners

Introduction

The integration of ICT in higher education has transformed learning by enhancing accessibility, fostering digital literacy, and improving research capabilities. ICT tools such as digital libraries, e-learning platforms, and electronic databases enable flexible learning, particularly benefiting distance learners by reducing geographical barriers (Saha, Shahrin & Prodhan, 2022). However, challenges such as inadequate infrastructure, lack of training, and financial constraints hinder ICT adoption (Ergado, Desta & Mehta, 2022). Addressing these issues requires structured policies, capacity-building initiatives, and equitable access to technology. Electronic Library Resources (ELRs) like e-books, e-journals, and online databases support research efficiency, but their utilization is limited by high subscription costs, digital literacy gaps, and poor internet access (Oluwaseun, 2023; Lepcha, Rai & Singh, 2024). Many students lack ICT proficiency in areas like database navigation and digital referencing. Universities should implement ICT training through workshops and library orientation programs to enhance student engagement with ELRs (Oseghale, 2023; Veena & Shivalingaiah, 2021). Incorporating ICT skills into academic curricula is crucial for digital literacy and research efficiency. For example, nursing students require informatics training to access academic resources effectively (Oluwaseun, 2023; Almarwani, 2024). The National Open University of Nigeria (NOUN) has invested in digital learning platforms and ELRs, yet challenges like low ICT proficiency, inconsistent internet access, and underutilization of digital platforms persist (Oseghale, 2023). Expanding e-library services, strengthening digital literacy programs, and improving internet infrastructure are essential to optimizing ICT adoption and digital learning at NOUN (Oseghale, 2023).

Statement of the Problem

The increasing dependence on Electronic Library Resources (ELRs) within academic institutions underscores the critical importance of robust Information and Communication Technology (ICT) skills. However, distance learning institutions such as the National Open University of Nigeria (NOUN) encounter significant challenges that hinder students' full engagement with these digital resources. Factors like poor internet connectivity, limited training opportunities, and usability issues impede the widespread usage of ELRs, thereby restricting learners from fully leveraging academic opportunities. A major concern is the varying levels of ICT proficiency among students, which affects their ability to navigate digital databases, access e-books, and utilize referencing tools effectively. This digital divide hampers access to vital scholarly materials, ultimately constraining research capabilities and learning outcomes. Although students express a willingness to improve their ICT skills, the absence of structured interventions continues to obstruct progress. Addressing these barriers is essential for fostering digital inclusion and enhancing ELR utilization. This study aims to evaluate ICT competencies and ELR adoption among NOUN's distance learners, identify existing challenges, and recommend strategies to strengthen digital literacy. By bridging ICT gaps and ensuring equitable access to resources, this research tends to investigate application of information and communication technology (ICT) proficiency and electronic library resources among distance learners at the National Open University of Nigeria.

Research Objectives

1. To evaluate the impact of internet accessibility and the usability of library platforms on the distance learners using ELRs at NOUN.
2. To identify training programs that enhance ICT skills and assist distance learners at NOUN to effectively use Electronic Library Resources (ELRs) to boost their academic success and bridge the digital divide.

Research Questions

1. What is the impact of internet accessibility and the usability of library platforms on the engagement and effectiveness of distance learners using ELRs at NOUN?
2. How can training programs be designed to enhance ICT skills and assist distance learners at NOUN to effectively use Electronic Library Resources (ELRs) to improve their academic success and bridge the digital divide?

Literature review

Impact of Internet Accessibility and the Usability of Library Platforms on the Distance Learners.

Internet accessibility and library platform usability significantly enhance distance learners' engagement and effectiveness with Electronic Library Resources (ELRs). The engagement and effectiveness of distance learners in utilizing Electronic Library Resources (ELRs) are significantly influenced by internet accessibility and the usability of library platforms. Reliable, high-speed internet is essential for effective online learning, as research indicates that limited access can hinder students' ability to participate in courses and engage with ELRs, ultimately affecting academic performance (Yeh & Tsai 2022).

Equally important is the design and functionality of library platforms. A user-friendly interface enhances learner engagement by making resources more accessible. Research by Alshaikh (2022), found that students report higher satisfaction and efficiency when platforms prioritize usability. Furthermore, improved internet access and well-designed platforms contribute to increased interaction with ELRs, leading to better academic outcomes (Mandrekar, 2021)). Addressing these two factors can significantly enhance the learning experience and academic success of distance learners.

Distance learners generally demonstrate foundational digital skills; however, they encounter difficulties with advanced tasks such as information retrieval, critical evaluation, and synthesis, which hampers their effective use of electronic library resources. Specific challenges include poor source integration, insufficient citation abilities, and ineffective search strategies, underscoring the importance of enhanced ICT training (Lepcha, Rai & Singh, 2024).

A systematic review of the literature on nursing students' informatics competency revealed moderate proficiency in computing skills but significant deficiencies in database navigation and clinical informatics, highlighting the need to integrate informatics into the curriculum as a potential solution (Almarwani, 2024). Similarly, higher education in Namibia faces ICT literacy gaps among both students and faculty, necessitating investments in digital infrastructure and targeted training programs (Erisher, Rukanda & Zanele, 2020). Furthermore, distance learners often struggle with online search tools, and librarians report widespread digital illiteracy and resistance to engaging

with e-resources. This situation calls for ongoing, targeted training initiatives (Buruga & Osamai, 2019). A study focusing on first-year medical students revealed a discrepancy between self-assessed and actual ICT proficiency, highlighting the need for specific skill development programs (Urda-Cîmpean & Gheban-Roşca, 2023).

Training Programs to Enhance ICT Skills for Distance Learners Using ELRs

In the digital age, ICT skills are essential for distance learners to navigate online learning and utilize electronic library resources (ELRs). Tailored training programs help bridge this gap by incorporating practical, hands-on components that boost learners confidence and engagement with ELRs (Khan & Bhatti, 2021). However, the digital divide disparities in access to technology remains a major barrier. Inclusive training initiatives are needed to ensure equitable learning opportunities, particularly for underserved communities (Lin et al., 2023). Research shows that sustained ICT training significantly enhances student achievement (Lin et al. 2023). Masenyani et al. (2025) identified various ICT-related training approaches in academic institutions that are essential for enhancing digital engagement and improving academic outcomes, particularly for distance learners. These approaches include blended learning, which integrates in-person and online instruction; flexible and mobile learning that enables access to content anytime and anywhere; and video-based teaching that supports skills development and learner engagement. The study also notes that, due to limited institutional support, educators often rely on personal resources to facilitate learning. Addressing ICT skill gaps through targeted training programs such as structured instruction in ICT-based teaching, hands-on digital content development, and continuous technical support is therefore crucial. Establishing ICT departments and organizing regular workshops are further recommended to ensure the effective and sustainable integration of technology into teaching and learning practices.

Theoretical Framework

This research investigates the information and communication technology (ICT) skills, internet accessibility, and electronic library resource (ELR) usage among distance learners, utilizing the Information Literacy Competency Framework and the Unified Theory of Acceptance and Use of Technology (UTAUT). These frameworks facilitate an assessment of learners' technological competencies and the factors that influence their engagement with ELR. The Information Literacy Competency Framework emphasizes learners' capacity to access, evaluate, and effectively utilize information, fostering critical thinking and lifelong learning (ACRL, 2016). Strengthening ICT skills and providing targeted training align with its principles, enabling learners to proficiently navigate digital resources. The UTAUT model (Venkatesh et al., 2003) highlights four primary factors affecting technology adoption: performance expectancy, effort expectancy, social influence, and facilitating conditions. The study explores how internet accessibility and platform usability influence ELR utilization. By integrating these models, the research aims to generate insights into improving digital literacy, increasing access to ELR, and promoting effective technology adoption within open and distance learning environments.

Research Methodology

The total number of distance learners at the National Open University of Nigeria (NOUN) is 130,099 (NOUN Website: <https://nou.edu.ng/>). The research was conducted at one study centre

library from each of Nigeria’s six geopolitical zones, totaling six study centre libraries as the study settings. A sample of 399 students was selected for the study using Yamane’s formula.

The collected data were analyzed using Statistical Package for the Social Sciences (SPSS) version 26. The analysis included descriptive statistics (frequencies, means, and standard deviations) to summarize demographic data and ICT skill levels. Results were presented in the form of tables and charts for better interpretation and understanding of trends among distance learners at NOUN.

Data Presentation

Demographic representation of respondents

Figure 1: Gender

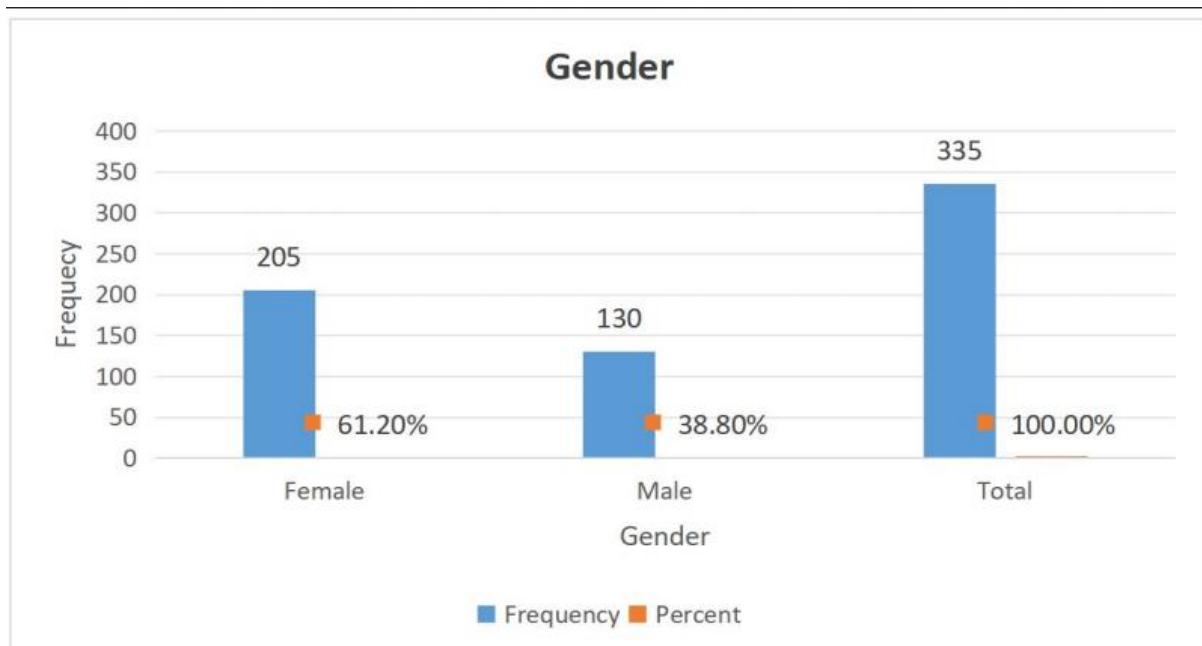


Figure 2: Age

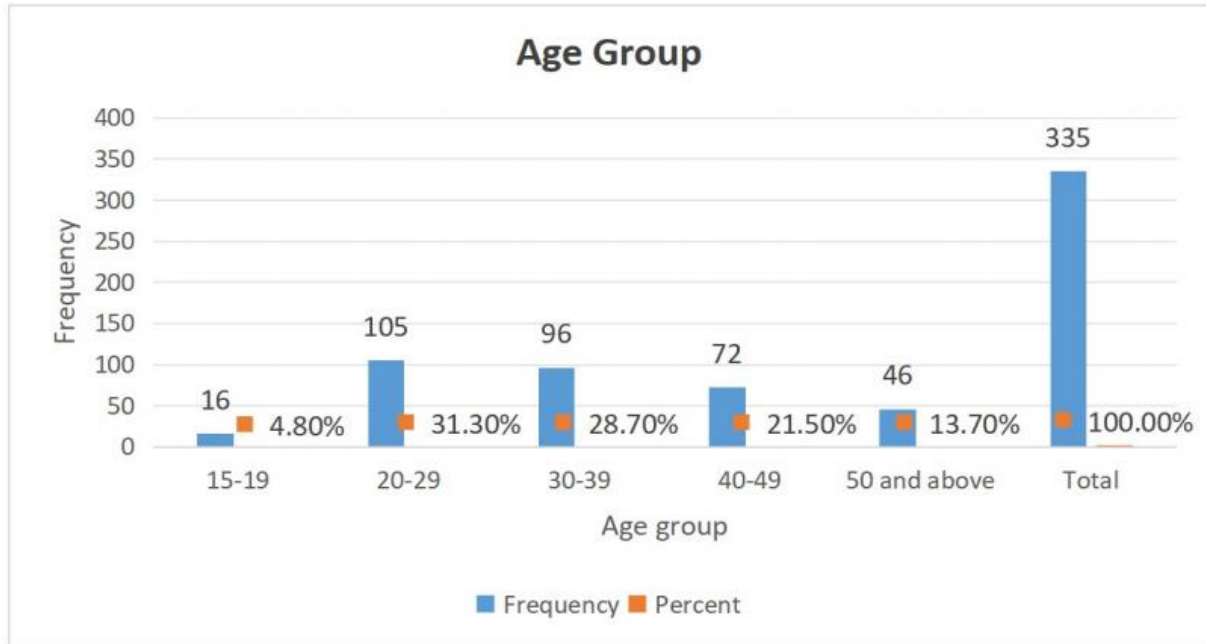
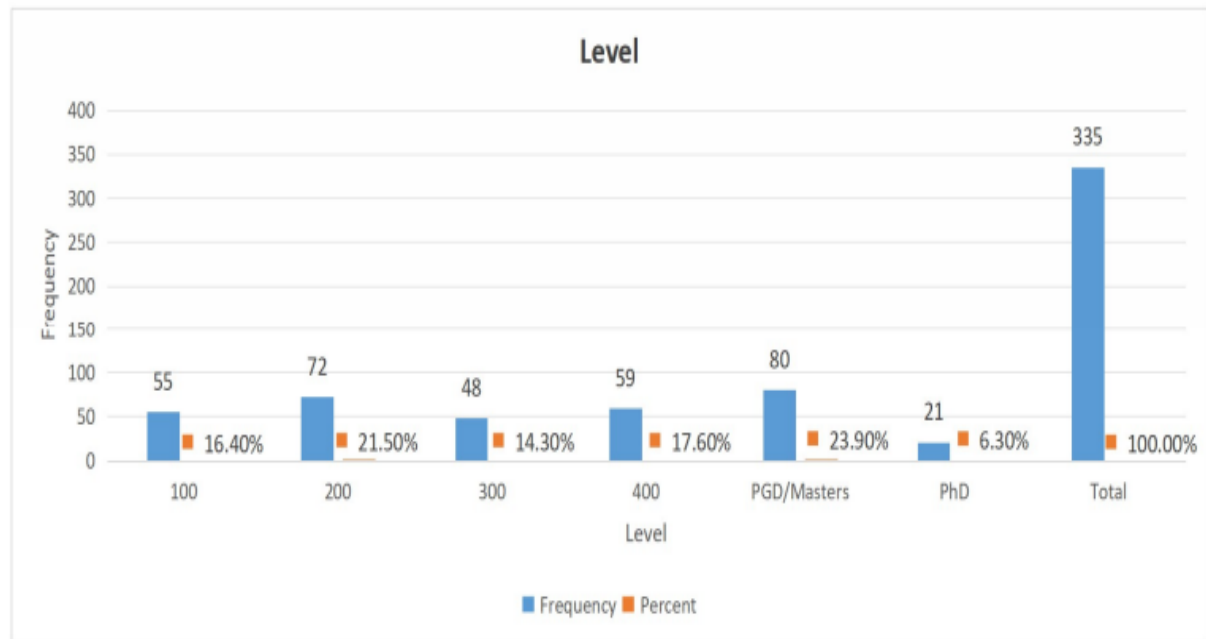


Figure 3: Educational Level



Results of the Findings

The population of distance learners consists of 61.2% females and 38.8% males, indicating that females make up the larger proportion of respondents. In terms of age distribution, the largest group falls within the 20–29 years range (31.3%), followed closely by those aged 30–39 years (28.7%). A significant portion (21.5%) are within the 40–49 years category, while the smallest group comprises individuals aged 15–19 years (4.8%). This distribution reflects a diverse mix of young and middle-aged adults, likely including both students and working professionals. Regarding educational levels, the highest percentage of respondents (23.9%) are postgraduate students pursuing PGD or Master’s degrees, while the smallest group consists of PhD students (6.3%). Among undergraduates, the distribution is fairly balanced, with 200 Level students representing the largest subgroup at 21.5%. Overall, these findings illustrate a diverse cohort of students, with a notable concentration at the postgraduate level.

Research Question 1: What is the Impact of Internet Accessibility and the Usability of Library Platforms on the Engagement and Effectiveness of Distance Learners using ELRs at NOUN?

Table 4: Internet Accessibility and the Usability of Library Platforms on the Engagement and Effectiveness of Distance Learners at NOUN

Items Statement	SD	D	A	SA	Mean	SD*	Des.
Unreliable internet access prevents me from fully utilizing online academic resources.	81 (24.2)	244 (72.8)	10 (3.0)	0	3.21	0.477	D
I experience difficulties accessing ELRs due to poor internet connectivity.	158 (47.2)	164 (49.0)	7 (2.1)	6 (1.8)	3.41	0.627	D
The user-friendliness and design of the library platform affect my ability to locate and utilize ELRs effectively.	122 (36.4)	164 (49.0)	47 (14.0)	2 (0.6)	3.21	0.696	D
I find it easy to navigate and search for academic materials on the electronic library platform.	4 (1.2)	42 (12.5)	178 (53.1)	111 (33.1)	3.18	0.688	A
Limited access to ICT infrastructure (e.g., computers, internet, software) hinders my ability to fully utilize ELRs.	117 (34.9)	214 (63.9)	4 (1.2)	0	3.34	0.498	D
Overall Mean					3.27	0.597	A

Key: Strongly disagree (SD), Disagree (D), Agree (A), Strongly agree (SA)

The analysis of Table 4 highlights how internet accessibility and library platform usability impact distance learners at the National Open University of Nigeria (NOUN). With an overall mean of 3.27, the data suggests a generally positive experience. Most students (72.8%) disagreed that unreliable internet limits their use of academic resources, indicating internet reliability is not a major barrier. However, 47.2% acknowledged difficulties accessing electronic library resources (ELRs) due to poor connectivity, showing that some still face internet-related challenges. In terms of platform usability, while a minority reported design-related issues, the majority (86.2%) found the platform easy to navigate and use. Furthermore, 63.9% disagreed that limited access to ICT infrastructure hinders their use of ELRs, suggesting most students have sufficient technological resources. Overall, the findings indicate that NOUN learners are generally well-equipped to engage with ELRs, although some improvements in connectivity and platform usability could enhance their experience further.

Research Question 2: How can Training Programs be Designed to Enhance ICT Skills and Assist Distance Learners at NOUN in Effectively using Electronic Library Resources (ELRs) to improve their academic success and bridge the digital divide?

Table 5: Training Programs Designed to Enhance ICT Skills and Assist Distance Learners at NOUN

Items Statement	SD	D	A	SA	Mean	SD*	Des.
I have participated in training programs designed to improve my ICT skills for electronic library use.	5 (1.5)	140 (41.8)	82 (24.5)	108 (32.2)	2.87	0.887	D
The training programs I have attended have improved my ability to search, retrieve, and utilize ELRs effectively.	2 (0.6)	137 (40.9)	74 (22.1)	122 (36.4)	2.94	0.892	D
More practical hands-on ICT training sessions would enhance my confidence in using ELRs.	21 (6.3)	11 (3.3)	168 (50.1)	135 (40.3)	3.24	0.793	A
I have attended ICT training programs that specifically addressed the use of digital technologies and internet tools to support my academic performance.	111 (33.1)	181 (54.0)	24 (7.2)	19 (5.7)	3.15	0.781	D

Additional ICT training should be integrated into the university curriculum to assist distance learners in using ELRs effectively.	0	29 (8.7)	135 (40.3)	171 (51.0)	3.42	0.647	A
Overall Mean					3.12	0.8	A

Key: Strongly disagree (SD), Disagree (D), Agree (A), Strongly agree (SA)

Table 5 presents respondents' perceptions of ICT training programs and their influence on electronic learning resource (ELR) utilization. The overall mean score of 3.12 (SD = 0.800) falls within the "Agree" category, indicating an acknowledgment of ICT training's role in enhancing digital literacy and academic performance. Despite this recognition, many respondents reported limited participation in ICT training programs (Mean = 2.87, SD = 0.887) and expressed doubts about their effectiveness in improving ELR utilization (Mean = 2.94, SD = 0.892). These findings underscore the need for more structured and accessible training initiatives. There is strong support for practical, hands-on ICT training, with respondents agreeing that such sessions would boost their confidence in using ELRs (Mean = 3.24, SD = 0.793). Furthermore, respondents indicated participation in ICT training programs focused on the use of digital technologies and internet tools to support academic performance (Mean = 3.15, SD = 0.781), underscoring the pressing need for infrastructural improvements. Respondents also advocate for integrating ICT training into the university curriculum (Mean = 3.42, SD = 0.647), reinforcing the call for institutional interventions. Overall, the findings emphasize the necessity of comprehensive ICT training, enhanced infrastructure, and curriculum development to support students in effectively utilizing ELRs.

Discussion of findings

Internet Accessibility and Library Platform Usability

The responses reflect a generally positive experience, with a mean score of 3.27. Most learners did not view unreliable internet or ICT infrastructure as major barriers. However, approximately half of the respondents reported challenges related to poor internet connectivity and platform usability, indicating that infrastructural inconsistencies continue to impact a significant minority. These findings align with Yeh and Tsai (2022), who highlighted that limited internet access hampers participation in online learning and engagement with electronic library resources (ELRs). Additionally, the perceptions of platform usability correspond with Alshaiikh (2022), who found that user-friendly digital library interfaces significantly boost student engagement and satisfaction. Agboola (2010) further affirm that improved platform design and reliable internet access are positively associated with better academic outcomes.

Training Programs Designed to Enhance ICT Skills

Respondents recognized the value of practical, hands-on ICT training, with a mean score of 3.24, and supported integrating ICT skill development into the curriculum (Mean = 3.42). However, participation in existing training programs was relatively low (Mean = 2.87), and their

effectiveness was questioned (Mean = 2.94). These findings underscore the need for well-structured and engaging training interventions. Khan and Bhatti (2021) argue that tailored training enhances learners' confidence and their use of electronic library resources (ELRs). The importance of inclusive and sustained training efforts is reinforced by Lin et al. (2023), who found that targeted ICT training significantly improves academic achievement. Additionally, persistent infrastructural challenges such as limited access to devices and the internet mirror concerns raised by Siddiquah and Salim (2017) and Oyeniran and Olajide (2016), who advocate for increased institutional support and investment in digital infrastructure to address these issues.

Summary of Findings

The study examined ICT skills and proficiency among distance learners, focusing on the usability of library platforms, internet accessibility, and the effectiveness of training programs in enhancing ICT competence. Results indicate that while learners exhibit moderate ICT skills and confidence in basic digital tasks, many face difficulties with more advanced abilities such as proper citation, source integration, and navigating electronic library resources (ELRs). Although perceptions of internet access and platform usability are generally positive, infrastructural inconsistencies continue to restrict access for a notable minority of students. Additionally, despite support for incorporating ICT skills into the curriculum and promoting skill development, existing training programs are often underutilized and viewed as ineffective. These findings reveal critical gaps in digital literacy, infrastructural support, and training systems that need to be addressed.

Conclusion

Distance learners at NOUN exhibit moderate ICT proficiency, but there are notable deficiencies in advanced academic digital literacy, particularly in the effective use of ELRs. While internet accessibility and library platform usability are generally adequate, infrastructural issues still pose barriers for some students. The low participation in and questionable impact of existing training programs underscore the need for better-design, inclusive, and curriculum-integrated ICT training. Bridging these gaps is essential to maximizing the educational benefits of ELRs and enhancing student academic performance.

Recommendations

1. There is a need for National Open University of Nigeria to improve infrastructure, accessibility, and platform usability by enhancing digital infrastructure and broadening internet coverage and increasing access to digital devices, especially in all study centre libraries across the nation.
2. The National Open University Library should enhance platform usability and foster engagement by further optimize e-library platforms to ensure they are mobile-friendly, easy to navigate, and support multiple languages, thereby creating a more seamless and inclusive user experience. Simultaneously, promote active engagement by launching librarian-led digital literacy awareness campaigns, orientation programs, and peer mentoring initiatives. Regular evaluations should be conducted to assess the effectiveness of training efforts and to monitor the impact of electronic library resources (ELR) usage.

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