

Impact of Digital Literacy on University Students' Use of Digital Resources in Nigeria

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Abstract - Digital literacy is a skill that university students must possess in order to use the many digital resources that are provided by university libraries. As a result, the study examined the impact of digital literacy on Nigerian university students' use of Internet resources. The research examined how high and low levels of digital literacy influenced students' utilization of digital resources and also explored the roles of university libraries in promoting and assisting students in enhancing their digital literacy and supporting their utilization of digital resources. The research also delved into effective strategies for improving digital literacy within Nigerian university libraries. Overall, the study established that digital literacy is vital for students in Nigerian universities and directly impacts their utilization of digital resources. The insights gained from this research shed light on the significance of promoting digital literacy in academic settings and the collaborative efforts required from institutions and libraries to empower students in this digital age.

Keywords: Digital Literacy, Use of Digital Resources, University Students, Nigeria

I. INTRODUCTION

The university library is a kind of academic library connected to a particular university. It functions as an information, resource, and service hub for the university community's teaching, learning, and research endeavours. According to Unegbu & Otuza (2015), a university library is a particular kind of academic library that offers information resources to assist learning, teaching, and research in order to meet the information needs of the university community. This applies to students, teachers, and other staff members. University libraries may provide a range of services to help research and scholarship in addition to having specialized collections that represent the institution's interests in both teaching and research. Libraries have long acted as centers for knowledge and information, giving users access to books, periodicals, and other sources. Until recently, library collections mainly consisted of printed materials, but as digital technologies developed university libraries have expanded their collections to include digital resources like e-books, e-journals, online databases, and other digital resources (Ogunbodede & Oribhabor, 2022). These online tools are now essential for academic research, instruction, and learning.

The term "digital resources" refers to electronic content that may be accessed on computers, cell-phones, and tablets. Digital resources include any type of information, data, or media that is kept digitally and can be accessed by electronic devices like computers, smartphones, and tablets, according to Kalfatovic & Bianchini (2015). They contain a wide range of knowledge, information, and media that is kept in a digital format, including multimedia, online databases, e-books, e-journals, and digital archives. Users can access information and knowledge from digital resources at any time and from anywhere, usually through the internet. According to Tenopir *et al.*, (2014), university libraries' digital resources give students access to a wealth of knowledge and research materials from anywhere at any time, which can enhance their academic and research performance. Luce (2015), contends that digital resources give students more accessibility and enable them to conduct research and complete projects more quickly, this idea is supported. Also, digital materials are frequently more current than print resources, offering students' access to the most recent knowledge and research in their field of study (Willinsky, 2013).

Students at universities frequently use digital tools for a range of activities, including research, communication, collaboration, and online learning. In the current digital world, it is crucial for colleges to teach their students digital literacy and the abilities to efficiently explore and use internet resources. The ability to use, comprehend, and transmit information using digital technologies is referred to as digital literacy. According to Yo (2021), digital literacy is the availability of the knowledge and abilities required for pupils to use digital technologies and Internet resources in a secure and efficient manner. It includes a broad range of abilities, such as the capacity to use digital tools and resources, explore the Internet, assess the accuracy of online information, and successfully interact via digital media. For university students to be able to access the many digital resources offered by university libraries, digital literacy is a necessary ability. With the development of digital technology, students now have access to a wide range of online tools that can improve their academic experience, such as online learning platforms, libraries, e-books, journals, and other digital resources.

Like students in many other nations, university students in Nigeria are becoming more and more dependent on internet resources for education, research, and communication. Due to the massive distribution of low-cost smartphones and the expansion of Internet connectivity throughout the nation, the usage of digital resources by university students in Nigeria has substantially expanded in recent years. Access improvement is one of the main ways that digital literacy improves university students' utilization of digital resources in Nigeria (Afolayan & Akinpelu, 2019). Through their online search abilities, information retrieval abilities, and web navigational abilities, students who are digitally literate can quickly find and use digital resources. This enables them to maximize the use of the digital resources at their disposal. Additionally, digital literacy encourages Nigerian university students to utilize digital resources effectively. Digitally savvy students can use online tools to organize their academic work, collaborate with classmates, and access online resources pertinent to their field of study, among other ways to leverage digital resources to boost their academic success.

Additionally, Hargittai (2016) asserted that students' critical thinking abilities are positively impacted by digital literacy. By differentiating between dependable and inaccurate sources, examining data, and deriving insightful conclusions from digital resources, it enables students to assess the value and applicability of digital resources. This aids in the development of critical thinking abilities, which are crucial for success in the current digital era. Last but not least, digital literacy encourages innovation and creativity in college students (Bawden & Robinson, 2016).

Digitally literate students can use tools to express their creativity and generate novel concepts, such as building websites, computer programs, and multimedia presentations. The way university students in Nigeria use digital resources is significantly influenced by their level of digital literacy. For Nigerian universities to prepare their students for success in the digital age, it is crucial that they include digital literacy training in the curriculum and actively encourage it among their students.

On the other hand, university students' capacity to conduct research and excel academically may be hampered if they are unable to successfully access and use the huge array of digital materials made available by their university libraries. Students who lack digital literacy abilities may find it difficult to conduct research, obtain information, and collaborate with peers and professors (Warschauer & Matuchniak, 2010). The usage of digital resources by Nigerian university students might be negatively impacted in a number of ways by low levels of digital literacy. Lack of digital skills and knowledge may prevent many students from accessing, evaluating, and using digital resources including online databases, e-books, and other digital items. Limited access to information is one important effect. Without high digital literacy, students might find it challenging to use online databases and other digital tools, which would limit

their access to knowledge that is crucial for academic performance (Carretero *et al.*, 2017).

The inability to analyze information critically is another consequence of insufficient digital literacy (Martin and Grudziecki, 2006). In order to assess the authority and dependability of online sources, one must be digitally literate. Without this ability, students can rely on untrustworthy or biased sources, which could lead to academic work of lower quality. According to Warschauer & Matuchniak (2010), inadequate digital literacy might also result in weak research abilities. In order to conduct effective research, one must be able to find, assess, and effectively utilize digital resources. Students who struggle with these activities may conduct ineffective research and produce academic work of lesser caliber. Furthermore, a lack of digital literacy might make collaboration difficult (American Library Association, 2013). The capacity to collaborate and communicate with others using digital tools and platforms is a component of digital literacy. Without these abilities, students could find it difficult to work effectively in teams or with teachers, which would result in less effective teamwork and learning results.

To solve this problem, there is a need for more funding to be allocated to digital literacy education and resources for Nigerian university students, in order to give them the tools and training they need to flourish in a world that is quickly more digital. To assist students in acquiring digital literacy skills, universities in Nigeria should offer training and support services. Combining formal education with real-world experience can help someone become more digitally literate. Through classes, workshops, and other resources that show students how to use digital technology successfully for academic and professional objectives, universities can offer digital literacy training to their students. Access to user-friendly digital tools and resources can also aid students in getting beyond some of the obstacles caused by a lack of digital literacy. Universities may support students in their academic endeavours and equip them with the skills they need to flourish in a world that is quickly digitizing by enhancing their digital literacy. Universities play a crucial role in encouraging and enabling the development of these crucial abilities, as digital literacy is generally necessary for university students to flourish in today's digital environment.

II. STATEMENT OF THE PROBLEM

For university students to be able to access the many digital resources offered by university libraries, digital literacy is a necessary ability. With the development of digital technology, students now have access to a wide range of online tools that can improve their academic experience, such as online learning platforms, libraries, e-books, journals, and other digital resources. However, the majority of university students in Nigeria lack the technical skills necessary to use digital resources successfully, despite the fact that they are more readily available and crucial for academic achievement. Many Nigerian university students, especially in areas like information retrieval and evaluation, have weak digital

literacy abilities (Ojokheta & Imogie, 2020). Many students may find it difficult to traverse digital platforms or access online databases because they are unfamiliar with the most recent digital tools and resources accessible to them. Their ability to obtain the information they require for their studies or properly participate in online learning activities may suffer as a result, which can have a detrimental influence on their academic achievement. Their capacity to access and successfully use digital resources may be restricted as a result, which could lower their academic achievement. In order to give university students in Nigeria the skills necessary to successfully use digital resources for academic success, there is a need for greater investment in digital literacy training. Nigeria can better prepare its workforce for success in a fast digitized world by strengthening the digital literacy abilities of university students.

III. CONCEPT OF DIGITAL LITERACY AND DIGITAL RESOURCES

Digital literacy is the capacity to find, assess, create, and convey information using digital technology effectively and efficiently. Digital literacy, according to the European Commission (2017), is the capacity to use a variety of digital devices to effectively and critically navigate, assess, and produce information. Digital literacy is defined by the American Library Association (2013) as the capacity to locate, assess, use, and produce information using digital technologies, communication tools, or networks. It includes a variety of abilities, from fundamentals like typing and utilizing software to more complex ones like coding, digital marketing, and online collaboration. Digitally literate people are better able to interact with others, obtain information, and traverse the digital world. Critical information evaluation skills, such as determining the reliability of sources and spotting fake news, are also part of digital literacy.

Any kind of digital data or content that can be shared or accessed electronically is referred to as digital resources. Digital resources include any forms of online-accessible digital content, such as text, photos, audio, and video that may be accessed using a computer or mobile device (Library of Congress, 2021). "Digital resources" are defined as "electronic materials that can be accessed and used to support teaching, learning, and research" (Association of College and Research Libraries, 2017). They may consist of a wide range of resources, including databases, software, e-books, online articles, videos, audio files, and digital photographs. These resources can be accessed using a variety of digital devices, including computers, cell-phones, tablets, and other internet-capable gadgets. They are frequently disseminated via online channels like websites, social media, and electronic databases.

A. Impacts of High Digital Literacy on University Students' Use of Digital Resources in Nigeria

1. Improved Access and Use of Digital Resources: High levels of digital literacy can help students access and utilize digital resources more efficiently for academic reasons, such

as online databases and e-books (Nwafor-Orizu & Adeniji, 2021).

2. Enhanced Critical Thinking Skills: The ability to evaluate digital information sources, discriminate between reputable and inaccurate sources of information, and draw conclusions based on evidence all require critical thinking abilities, which high levels of digital literacy can help children achieve (Adeyinka *et al.*, 2020).

3. Increased Engagement in Online Learning Activities: High levels of digital literacy can improve students' participation in online learning activities including collaborative learning and online conversations, which will improve their learning results (Oyelere *et al.*, 2021).

4. Improved Employability: Graduates with high levels of digital literacy may be more employable since they are equipped to use digital tools and technology in the workplace efficiently (Adebesin *et al.*, 2021).

B. Impacts of Poor Digital Literacy on University Students' Use of Digital Resources in Nigeria

1. Limited Access and Use of Digital Resources: Insufficient digital literacy can prevent students from using and accessing digital resources including e-books, online journals, and instructional software. As a result, their academic performance may suffer (Ugwuanyi & Ukwueze, 2018).

2. Inability to Evaluate the Credibility of Digital Sources: Students who lack the necessary digital literacy abilities may be unable to assess the reliability of online sources and evaluate them critically. Their academic work may as a result contain erroneous information (Ugwuanyi & Ukwueze, 2018).

3. Limited Participation in Online Activities: Student participation in online activities like online debates and collaborative learning may be discouraged by a lack of digital literacy. Their level of involvement and learning outcomes may suffer as a result (Oyelere *et al.*, 2021).

4. Limited Career Opportunities: Lack of digital literacy might make students less competitive in the job market because most firms now demand it. Their earning potential and job options may be restricted as a result (Adebesin *et al.*, 2021).

C. Roles of University Libraries in Promoting Digital Literacy and Supporting the Use of Digital Resources among Students in Nigeria

The usage of digital resources by students and the promotion of digital literacy are both important goals of university libraries in Nigeria.

1. Providing Access to Digital Resources: Access to digital resources like e-books, online journals, and databases that

promote students' digital literacy abilities is crucially facilitated by university libraries in Nigeria. Nkiko *et al.*, (2020) assert that improving pupils' digital literacy abilities requires access to digital resources.

2. Developing Digital Literacy Skills: In Nigeria, university libraries are in charge of helping students improve their digital literacy through a variety of initiatives and services like training and workshops. To help students develop their digital literacy skills, libraries can offer training and workshops (Alabi, 2019).

3. Promoting the Use of Digital Tools: By granting access to digital devices and software tools like reference management software and online collaboration tools, university libraries in Nigeria can encourage students to use digital tools. Adeyoyin *et al.*, (2019) assert that libraries can work with other organizations and partners to offer access to digital tools.

4. Providing User Support: In Nigeria, university libraries can assist students with user support services include technical assistance for using digital resources and troubleshooting typical problems. In order to ensure that students can utilize digital resources efficiently, user support services are crucial (Adeyoyin *et al.*, 2019).

5. Fostering Critical Thinking: By instructing students in the evaluation of digital resources and information sources, university libraries in Nigeria can promote critical thinking abilities in their patrons. Libraries can create initiatives that instruct students how to critically assess digital materials, claim Ojo *et al.*, (2021).

D. Strategies for Enhancing Digital Literacy in Nigerian University Libraries

Here are some methods to improve digital literacy in university libraries in Nigeria:

1. Training and Workshops: University libraries in Nigeria can set up seminars and workshops to advance digital literacy. In order to promote effective and efficient use of electronic resources following the COVID-19 epidemic, academic libraries should routinely host workshops and seminars to train students in information literacy abilities.

2. Invest in Digital Resources: University libraries in Nigeria can spend money on digital assets like e-books, online databases, and open access periodicals. For students and employees to become digitally literate, digital resources are crucial (Udo, 2020).

3. Collaborations: University libraries in Nigeria can work with other libraries, academic institutions, and business partners to exchange information, resources, and expertise. Collaborations are crucial for promoting digital literacy in university libraries, according to Adeyoyin *et al.*, (2019).

4. Digital Literacy Programs: University libraries in Nigeria have the ability to create curricula-integrated digital literacy programs. Ojo *et al.*, (2021) noted that digital literacy programs can aid students in acquiring the abilities required to use digital technologies for research and communication.

5. Invest in Technology Infrastructure: University libraries in Nigeria might spend money on technology infrastructure to improve digital literacy. Technology infrastructure is essential for enhancing students' and staff members' digital literacy abilities (Nkiko *et al.*, 2020).

6. Social Media: To enhance digital literacy, university libraries in Nigeria can use social media sites like Facebook, Twitter, and Instagram. Abioye & Olaifa (2019) pointed out that social media can be utilized to disseminate knowledge about digital tools and resources.

7. User Support: Students, faculty, and staff may receive user support services from university libraries in Nigeria. User support services are crucial for ensuring that students and staff have access to the tools and help they need to advance their digital literacy abilities, according to Adeyoyin *et al.*, (2019).

IV. RECOMMENDATIONS

The ability to access, evaluate, and effectively use digital resources is a skill that is becoming more and more important in today's society. For university students in Nigeria to effectively use digital resources for both academic and personal goals, they must possess excellent digital literacy abilities. Here are some ideas for enhancing how digital literacy affects Nigerian university students' use of digital resources:

1. Provide Training and Resources on Digital Literacy: Nigerian universities should provide their students workshops, online courses, and tutorials on themes including how to use digital resources efficiently, how to evaluate digital material, and how to safeguard oneself online.

2. Integrate Digital Literacy into the Curriculum: All academic fields should include digital literacy in their curricula, rather than just those that focus on computer science or information technology. Students will be more inspired to develop their abilities when they can see how important digital literacy is to their field of study.

3. Provide Access to Digital Resources: Students must have access to digital resources if they are to become digitally literate. Universities should give their students access to digital libraries, scholarly databases, and other online resources. Universities should also make technology like laptops, tablets, and Wi-Fi available to students so they have the equipment they need to access these services.

4. Encourage Collaboration and Sharing of Digital Resources: Universities should promote student

collaboration and the sharing of digital resources. Group initiatives, social media platforms, and online discussion forums can all be used for this. Students will be able to share their knowledge and experience and learn from one another by doing this.

5. *Foster a Culture of Innovation and Creativity*: Lastly, universities should promote an innovative and creative atmosphere that encourages students to experiment with new digital tools and resources. This can be accomplished by giving students the chance to take part in coding challenges, hackathons, and other digital innovation activities.

Universities in Nigeria can enhance the effect of digital literacy on their students' use of digital resources and aid in preparing them for success in the digital age by putting these recommendations into practice.

V. CONCLUSION

The utilization of digital resources by Nigerian university students is significantly influenced by their level of digital literacy. In the modern world, when digital technology has become a fundamental element of academic research and learning, the capacity to access, analyze, and use digital materials effectively is crucial. By giving students access to digital resources, nurturing the development of digital literacy skills, encouraging the use of digital technologies, offering user support services, and encouraging critical thinking, university libraries in Nigeria play a crucial role in promoting digital literacy among students. To ensure that university students in Nigeria can use digital resources successfully for academic and research reasons, there is a need for ongoing initiatives to improve their digital literacy abilities. To provide the essential resources, instruction, and assistance for students to enhance their digital literacy abilities, university libraries, academic divisions, and other stakeholders must work together. In the end, encouraging digital literacy among Nigerian university students will boost their academic achievement, research output, and competitiveness in the digital era.

REFERENCES

- [1] Abioye, A. I., & Olaifa, T. A. (2019). The role of social media in promoting digital literacy in Nigerian university libraries. *Library Philosophy and Practice*, 1, 1-12.
- [2] Adebesein, A. A., Afolayan, A. O., & Ogunyemi, A. A. (2021). Digital literacy and employability skills of Nigerian university students: A case study of Lagos State University. *Journal of Education and Practice*, 12(1), 131-140.
- [3] Adeniran, P., & Adeyinka, T. (2019). Digital literacy skills and use of electronic information resources among postgraduate students in Nigerian universities. *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/libphilprac/2318>.
- [4] Adeyinka, T., Odusami, M., & Bada, T. (2020). Digital literacy and critical thinking skills among undergraduate students in Nigeria. *Journal of Education and Learning*, 9(3), 135-144.
- [5] Adeyoyin, S. O., Ojo, O. A., & Salawu, I. O. (2019). Collaborative partnerships in enhancing digital literacy in Nigerian university libraries. *Journal of Academic Librarianship*, 45(1), 102-108.
- [6] Afolayan, O. A., & Akinpelu, A. O. (2019). Digital literacy skills and use of electronic information resources among students of two Nigerian universities. *Library Philosophy and Practice* (e-journal).
- [7] Alabi, B. S. (2019). Assessing the impact of library training and workshops on digital literacy among undergraduate students in Nigerian universities. *Library Philosophy and Practice*, (1), 1-13.
- [8] Ambrose, S. E. & Ogunbodede, K. F. (2022). Information literacy skills and use of electronic resources by undergraduate students amid the COVID-19 pandemic lockdown in Nigeria. *Communicate: Journal of Library & Information Science*, 24(1).
- [9] American Library Association (ALA). (2013). Digital literacy, libraries, and public policy. Retrieved from http://www.ala.org/advocacy/sites/ala.org/advocacy/files/content/advleg/publications/DigitalLiteracy_2013.pdf.
- [10] American Library Association. (2013). ALA Glossary of Library and Information Science (4th ed.). *American Library Association*.
- [11] American Library Association. (2013). Digital literacy, libraries, and public policy: Report of the Office for *Information Technology Policy's Digital Literacy Task Force*. Retrieved from <https://www.districtdispatch.org/wpcontent/uploads/2013/01/2012OITPdigitilreport12213.pdf>.
- [12] American Library Association. (2013). *Digital literacy*. Retrieved from <http://www.ala.org/acrl/standards/digitalliteracy>.
- [13] Association of College and Research Libraries. (2017). Framework for information literacy for higher education. <https://www.ala.org/acrl/standards/ilframework>.
- [14] Association of College and Research Libraries. (2018). Standards for Libraries in Higher Education. Association of College and Research Libraries.
- [15] Bawden, D., & Robinson, L. (2016). Information behaviour. In J. D. McDonald, & T. D. Treadway (Eds.), *Introduction to Library and Information Science (4th ed.)* (81-101). Libraries Unlimited.
- [16] Carretero, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use. Luxembourg: Publications Office of the European Union.
- [17] Erstad, O. (2010). Digital literacy: Tools and methodologies for information society. *Journal of Documentation*, 66(2), 291-292. DOI: <https://doi.org/10.1108/00220411011024116>.
- [18] European Commission. (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning. *Official Journal of the European Union*, L394/10-L394/18.
- [19] European Commission. (2017). A digital single market strategy for Europe. Retrieved from <https://ec.europa.eu/digital-single-market/en/news/digital-education-boosting-digital-literacy-skills>.
- [20] Hargittai, E. (2016). Digital literacy is about more than just mastering technology. The conversation. Retrieved from <https://theconversation.com/digital-literacy-is-about-more-than-just-mastering-technology-54142>.
- [21] Kalfatovic, M. R., & Bianchini, J. (2015). Digital resources and digital scholarship. In *Introduction to digital libraries* (153-172). Rowman & Littlefield.
- [22] Luce, R. E. (2015). The transformation of academic libraries in the digital age. *Journal of Academic Librarianship*, 41(6), 775-777. DOI: <https://doi.org/10.1016/j.acalib.2015.08.007>.
- [23] Martin, A., & Grudziecki, J. (2006). DigEuLit: Concepts and tools for digital literacy development. *Innovation in Teaching and Learning in Information and Computer Sciences*, 5(4), 249-267.
- [24] Martin, M., & Broussard, R. (2017). Digital literacy and academic libraries: An overview. *Reference Services Review*, 45(1), 4-20. Retrieved from <https://doi.org/10.1108/RSR-10-2016-0050>.
- [25] National Science Digital Library. (2021). What are digital resources? Retrieved from <https://nsdl.oercommons.org/page/what-are-digital-resources>.
- [26] National Telecommunications and Information Administration. (2017). Digital literacy: A resource guide. <https://www.ntia.doc.gov/files/ntia/publications/ntia-digital-literacy-guidebook.pdf>.
- [27] Nkiko, C., Ugwu, C. I., & Okoye, I. K. (2020). Digital infrastructure and digital literacy skills of students in Nigerian university libraries. *Library Philosophy and Practice*, 1, 1-9.
- [28] Nwafor-Orizu, C., & Adeniji, S. (2021). Digital literacy skills among university students in Nigeria: A case study of Nnamdi Azikiwe University. *Library Philosophy and Practice*, 1-18.

- [29] Ogunbodede, K. F., & Oribhabor, C. B. (2022). Digital resources usage and academic performance of undergraduate students in Nigeria: A case study. *European Journal of Interactive Multimedia and Education*, 3(2), e02213. DOI: <https://doi.org/10.30935/ejimed/12491>.
- [30] Ojo, O. A., Salawu, I. O., & Adeyoyin, S. O. (2021). Integrating digital literacy skills into the curriculum of Nigerian university libraries. *International Journal of Information and Education Technology*, 11(2), 53-59.
- [31] Ojokheta, K., & Imogie, I. (2020). Digital literacy skills and the use of electronic information resources by undergraduate students in Nigerian universities. *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/libphilprac/4396>.
- [32] Oyelere, S. S., Ogundokun, R. O., & Adewoyin, O. O. (2021). Digital literacy skills and academic achievement of undergraduate students in Nigerian universities. *Journal of Information Literacy*, 15(1), 73-91.
- [33] Tenopir, C., King, D. W., Boyce, P., & Grayson, M. (2014). Beyond downloads: Uses and users of electronic books. *College & Research Libraries*, 75(1), 74-89. DOI: <https://doi.org/10.5860/crl12-406>.
- [34] Udo, E. A. (2020). Digital resources and digital literacy skills of library users in Nigerian universities. *International Journal of Digital Library Services*, 10(1), 45-55.
- [35] Ugwuanyi, L. C., & Ukwueze, N. N. (2018). Digital literacy skills among undergraduate students of University of Nigeria, Nsukka. *Library Philosophy and Practice*, 1-16.
- [36] Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, 34(1), 179-225.
- [37] Willinsky, J. (2013). *The access principle: The case for open access to research and scholarship*. MIT Press.
- [38] Yo, N. (2021). Digital mathematical literacy as a component of the life skills of students of modern educational institutions. *The American Journal of Social Science and Education Innovations*, 378-384.