IMPACT OF DIGITAL LITERACY ON INTERNET SECURITY CONSCIOUSNESS AMONG UNDERGRADUATE STUDENTS IN FCT,

by

Goshie, Rhoda Wusa (Ph. D)
Federal University of Technology Library
Minna, Niger State. Nigeria
Mamawusa.77@gmail .com

Murjanatu Abdulkarim
Kashim Ibrahim Library (K.I.L.), Ahmadu Bello University(A.B.U.), Zaria. Nigeria
Murjis2000@gmail.com

Habiba Suleiman
Kashim Ibrahim Library (K.I.L.), Ahmadu Bello University (A.B.U.), Zaria.Nigeria
Habibasuleiman289@gmail.com

AND

Muhammad Nasir Umar
Kashim Ibrahim Library (K.I.L.), Ahmadu Bello University (A.B.U.), Zaria. Nigeria
mnumar@abu.edu.ng

Abstract

The study investigates the impact of digital literacy on internet security consciousness among undergraduate students in the Federal Capital Territory (FCT), Nigeria.
The objectives of the study were to; access the digital literacy skills among undergraduate students in F.C.T., evaluate the level of digital literacy skills and establish challenges encountered in the acquisition of digital literacy skills. A quantitative research methodology and survey research design was adopted, and data were collected using questionnaire administered to 381 respondents out of which 380 returned the completed questionnaire. Questionnaire was used as the instrument for data collection. The data collected were analyzed using descriptive statistics such as frequency, tables and simple percentages. The results revealed that while undergraduate students possessed moderate digital literacy skills, particularly in the use of productivity software, online search, and communication tools, many

struggled with critically evaluating online information sources. Findings also showed that students demonstrated relatively high levels of digital literacy. Furthermore, awareness of internet security practices, including the use of strong passwords and recognition of secure websites, was found to positively influence students' online behaviors and confidence in academic engagement. Despite these strengths, challenges such as unreliable internet access, insufficient training, high cost of devices, and limited institutional programs were identified as significant barriers to digital literacy acquisition. Based on these findings, the study recommends that universities strengthen training programs to improve students' critical evaluation skills, reinforce internet security awareness, and integrate digital literacy programs into academic curricula. In addition, stakeholders should address infrastructural and financial barriers by providing affordable internet access, subsidized digital devices, and structured digital literacy initiatives to support safer and more effective use of technology in higher education

Keywords: cybersecurity, cyber threats, identity theft, phishing and artificial Intelligence

Introduction

In recent years, the digital landscape in Nigeria has undergone significant transformation, particularly within the educational sector. Before the widespread integration of information and communication technologies (ICTs) into education, students' understanding of internet security was limited and mostly acquired through traditional educational approaches such as classroom-based lectures where teachers explained basic concepts of computer safety, printed handouts on safe computing practices, and awareness programs focused on avoiding common threats such as computer viruses, malware, and email scams. At this stage, students were introduced to fundamental computer literacy meaning the ability to operate basic computer functions, understand simple software applications, and follow guidelines to protect their devices from security risks. Literacy itself, in this context, refers broadly to the ability to read, write, and comprehend written material, which was essential for students to grasp instructional content related to security and technology use. This foundational literacy enabled students to gradually build skills that would later support their adaptation to the digital age. With the rapid expansion of internet-enabled devices and growing access to online platforms, undergraduate students today engage with ICTs not only for academic purposes but also to develop more advanced knowledge of internet security, including recognizing phishing attempts,

using strong passwords, and practicing safe online behaviors in an increasingly connected environment (Bankole, O., M., 2022).

Digital literacy refers to the ability to effectively find, evaluate, create, and communicate information using digital technologies. It goes beyond basic computer skills to include critical thinking and the responsible use of digital tools in various contexts. As technology evolves, developing digital literacy has become essential for academic success and lifelong learning, particularly for undergraduate students who rely heavily on the internet for research and communication. Therefore, enhancing digital literacy skills is a priority for educational institutions aiming to prepare students for the demands of the modern digital world. (Van Laar et al., 2017). However, this digital shift has also highlighted a pressing concern and the disparity between digital literacy and cybersecurity awareness among students. Digital shift refers to the rapid and widespread integration of digital technologies into everyday life especially within education, where learning, communication, and access to information increasingly rely on digital devices and online platforms.

The digital shift thus encompasses both the benefits of enhanced access and the challenges posed by increased vulnerability to cyber threats, creating a gap between basic digital literacy such as using devices and software and deeper cybersecurity awareness necessary to safeguard users in the online managing privacy settings on social media platforms is another vital skill, enabling users to control the visibility of their personal data and reduce exposure to identity theft or cyberbullying environment. Furthermore, recognizing phishing attempts, malware, and suspicious links is critical to safeguard information. These competencies, often grouped under digital literacy and cybersecurity awareness, are fundamental for safe participation in digital environments ding devices and sensitive information from cyberattacks.

The persistent gap in these skills among students highlights the urgent need for comprehensive digital literacy programs that integrate cybersecurity education, ensuring learners develop both practical theoretical skills. A study conducted by GetBundi in 2023 revealed that approximately 85% of Nigerian graduates possess no digital skills, emphasizing a significant skills gap in the country's workforce (BusinessDay, 2023). This deficiency includes lack of fundamental competencies such as using productivity software (e.g., Microsoft Office), managing digital communication tools like email, and effectively navigating the internet for research and information gathering.

More critically, many graduates are unfamiliar with cybersecurity practices such as creating secure passwords, identifying phishing scams, or protecting personal data online. Additionally, skills related to digital collaboration such as using platforms for virtual teamwork and file sharing are often underdeveloped, which limits graduates' readiness for modern workplaces that increasingly depend on digital communication and cloud-based tools use and protective behaviors in an increasingly digital world. (Nguyen, 2020).

The lack of essential digital skills among graduates and students has far-reaching disadvantages that affect individuals, organizations, and the broader economy. At the individual level, insufficient digital competence limits employability, as most modern jobs require at least basic proficiency in digital tools and online communication

Graduates without these skills face difficulties in performing tasks such as data entry, online research, and virtual collaboration, reducing their competitiveness in a technology-driven job market (Aina, 2020). Moreover, poor cybersecurity awareness increases vulnerability to cybercrimes, including identity theft, phishing, and fraud, which can lead to financial losses and damage to personal reputation (Nguyen, 2020). A study by Gabra et al. (2020) found that while students claimed to have basic knowledge of cybersecurity, they were not well-informed about protecting their data. The study also noted the absence of active cybersecurity awareness programs in most universities, indicating a systemic issue within the higher education system. Similarly, Garba et al. (2021) assessed cybersecurity awareness levels among students in Northeastern Nigeria and discovered that, although students had some understanding of internet banking security, their awareness of other cybersecurity aspects, such as cyberbullying and personal data protection, was moderate at best.

The integration of artificial intelligence (AI) into educational settings has further complicated the digital landscape. A study by Sulaiman and Makinde (2024) at Al-Hikmah University in Ilorin examined the impact of AI on students' cybersecurity awareness. The findings indicated that while AI tools can enhance learning experiences, they also introduce new privacy concerns and data protection challenges. Students demonstrated a moderate to good grasp of cybersecurity procedures, particularly regarding privacy concerns and proactive adoption of protective measures. However, the study emphasized the need for robust cybersecurity education to mitigate risks associated with AI integration in academic environments. Artificial Intelligence (AI) has also significantly enhanced digital literacy in internet security by equipping users with intelligent tools and personalized

learning platforms that promote awareness, detection, and prevention of cyber threats. Moreover, AI-driven analytics provide educators and institutions with insights into students' cybersecurity weaknesses, enabling the design of targeted interventions to improve overall digital competency (Kraemer-Mbula et al., 2021).

In contrast, many developing nations, particularly in sub-Saharan Africa and parts of South Asia, face challenges in achieving widespread digital literacy due to limited internet access, low teacher training in ICT, and inadequate infrastructure (World Bank, 2021). In countries like India, while digital initiatives such as digital india have improved access, the depth of digital literacy remains uneven, especially in rural areas where internet penetration is low (Basheer & Krishna, 2022).The main goal of the study is to investigate the level of internet security consciousness among undergraduates in the FCT.

Statement of the problem

In the digital age, the integration of technology into academic environments has become indispensable. Undergraduate students in Nigeria's Federal Capital Territory (FCT) increasingly rely on digital platforms for learning, communication, and accessing information. Before the proliferation of ICTs, classroom-based lectures where teachers explained basic concepts of computer safety, printed handouts on safe computing practices, and awareness programs focused on avoiding common threats such as computer viruses, malware, and email scams. Many students can navigate academic portals but remain unaware of how to detect malware or avoid insecure public Wi-Fi networks. This disparity poses significant risks, as students may unknowingly expose themselves to cyber threats due to inadequate knowledge and practices.

Many institutions lack active cybersecurity awareness programs, leaving students without formal guidance on safe online practices (Gabra et al., 2020). This deficiency is particularly concerning given the increasing sophistication of cyber threats targeting academic communities. Okokpujie et al. (2023) reported that 70.6% of college students surveyed were susceptible to phishing attacks due to unawareness, underscoring the urgent need for comprehensive cybersecurity education. The implications of inadequate digital literacy and cybersecurity awareness are far-reaching. Students' personal information, academic work, and financial data are at risk, which could lead to identity theft, financial loss, and academic fraud. Moreover, compromised student accounts could serve as entry points for larger cyberattacks, threatening institutional integrity and national security (Okokpujie et al., 2023).

Despite these risks, many students remain unaware of best practices for protecting themselves online. This study aims to fill the existing gap by investigating the current state of digital literacy among these students and its impact on their internet security consciousness.

Purpose of the Study

The purpose of the study was to investigate the current state of digital literacy among the undergraduate students in FCT and its impact on their internet security consciousness.

Objectives of the Study

The followings are the main objectives of the study.

1. To assess the digital literacy skills of undergraduate students in F.C.T
2. To evaluate the level of digital literacy of undergraduate students in F.C.T
3. To establish the challenges encountered in the acquisition of digital literacy skills

Literature Review

A study by Adeoye and Adeoye (2017) highlighted that while many Nigerian undergraduates are familiar with basic digital tools, there is a noticeable gap in their ability to effectively utilize these tools for academic and professional purposes. This gap is more pronounced in states with limited access to digital infrastructure. Students in urban universities often have better access to high-speed internet and modern computer labs compared to their counterparts in rural institutions (Afolabi & Afolabi, 2024). The disparity in digital literacy skills is further exacerbated by the inconsistent integration of Information and Communication Technology (ICT) into university curricula. While some institutions have incorporated ICT training into their programs, others have yet to make it a priority, leaving students to acquire these skills independently (Udoh et al., 2020). This lack of standardized digital education results in a student population with varying degrees of proficiency in essential digital competencies.

Moreover, the reliance on mobile devices for internet access among Nigerian students presents both opportunities and challenges. While smartphones provide a convenient means for students to access information, the limited functionality compared to computers can hinder the development of more advanced digital skills, such as data analysis and content creation (Okpa et al., 2025). Additionally, the high cost of data and unreliable electricity supply further impede consistent access to digital resources. Digital literacy among undergraduate students in Nigeria has become increasingly important in today's digital age. With the proliferation of digital

technologies, students are expected to possess a range of skills to effectively navigate and utilize digital platforms for academic and personal purposes. Studies have shown that digital literacy encompasses various competencies, including the ability to access, evaluate, and create information using digital technologies. These skills enable individuals to effectively interpret and produce information in digital formats.

In the Nigerian context, research indicates varying levels of digital literacy among undergraduate students. A study by Afolabi and Afolabi (2024) found that while many students have access to digital resources, their proficiency in utilizing these tools effectively varies. Similarly, Umar and Dangwaran (2023) observed that students at Gombe State University exhibited moderate levels of digital literacy, with notable gaps in critical evaluation and ethical use of information. Factors influencing digital literacy levels among undergraduates include access to digital devices, quality of internet connectivity, and exposure to digital literacy training. A study conducted at Ahmadu Bello University highlighted that students with regular access to computers and the internet demonstrated higher digital literacy skills compared to those with limited access (Haruna, 2024)

Gender and faculty affiliation also play roles in digital literacy levels. Bayrakcı and Narmanlıoğlu (2021) revealed that male students often report higher confidence in using digital technologies compared to their female counterparts. Additionally, students in science and technology faculties tend to exhibit higher digital literacy skills than those in humanities and social sciences. The acquisition of digital literacy skills among undergraduate students in Nigeria is influenced by various challenges that hinder their ability to effectively use digital tools and protect themselves online. One major problem is the uneven access to digital devices and internet connectivity. Many students come from low-income backgrounds and struggle to afford smartphones, laptops, or consistent data plans. This makes it difficult for them to participate in digital training or practice essential skills outside the classroom. According to Adegbija and Bola (2021), financial constraints remain a top barrier to the development of digital competencies in Nigerian tertiary institutions. Without reliable access to the internet, students are left behind in a world where digital skills are essential for both academic and personal life.

Another significant challenge is the inadequate digital infrastructure within most universities in Nigeria. Despite the growing importance of technology in education, many institutions still lack modern computer labs, reliable Wi-Fi connections, and updated software. In some cases, power supply interruptions further complicate students' access to these tools. Yusuf et al. (2020) observed that the digital divide in

Nigerian universities is not only about access to devices but also about the quality and reliability of infrastructure that supports digital learning.

When students cannot use the available resources comfortably and consistently, their motivation to engage in digital learning reduces, limiting their growth in internet security awareness. Another issue is the limited integration of digital literacy into the academic curriculum. While some courses may touch on the use of computers or online research, there is usually no deliberate or comprehensive plan to equip students with skills such as cyber hygiene, password management, or data protection. Akpan and Essien (2021) emphasized that most Nigerian universities have not mainstreamed digital literacy education across faculties, making it optional rather than a core requirement. As a result, many students graduate without a strong understanding of how to use the internet securely and responsibly. A study by Eze and James (2020) found that students often skip reading online guidelines or ignore software prompts simply because they do not fully understand the terms used. This limits their ability to engage meaningfully with internet security tools.

Methodology

Quantitative research method and survey research design was adopted for the study. The target population for the study comprises selected undergraduate students enrolled in tertiary institutions within the Federal Capital Territory (FCT), Abuja. This includes students from both public and private universities located in the area, such as the University of Abuja, Baze University, Nile University, and Bingham university Abuja.

According to estimates, the total population of undergraduate students in Abuja universities was approximately 50,000. To determine an appropriate sample size, the Krejcie and Morgan (1970) formula was applied:

$$\mathbf{S = X^2NP(1 - P) / [d^2(N - 1) + X^2P(1 - P)]}$$

Where:

- **S** = required sample size
- **X^2** = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841 for 95%)
- **N** = population size (50,000)
- **P** = population proportion (assumed to be 0.5 for maximum sample size)
- **d** = degree of accuracy expressed as a proportion (0.05)

Substituting the values:

$S = (3.841 \times 50{,}000 \times 0.5 \times 0.5) / [(0.05)^2 \times (50{,}000 - 1) + 3.841 \times 0.5 \times 0.5]$
$S = (3.841 \times 50{,}000 \times 0.25) / [(0.0025 \times 49{,}999) + (3.841 \times 0.25)]$
$S=(48{,}012.5)/[124.9975+0.96025]$
$S=48{,}012.5/125.95775$
$S \approx \mathbf{381}$

Therefore, a sample size of **381** undergraduate students was selected using simple random sampling. Questionnaire was adopted as the instrument for data collection and descriptive statistics was used for data analysis. The data collected was analyzed using descriptive statistics in the form of frequency, tables and simple percentages derived from Google forms. The presentations of the data for the research objectives were done using tables. SPSS V.27 was used to analyze the data. The questionnaire was administered by the researcher to undergraduates using Google forms. The form link was sent to various WhatsApp groups of these students which was obtained from the respective course representatives in the different universities chosen for the study. The researcher ensured that undergraduates completely fill the questionnaire. The administration of the data collection instrument took a duration of two (2) weeks for its completion.

Findings

Table 1: Types of Digital Literacy Skills of Undergraduate Students

Statement	Strongly Agree f(%)	Agree f(%)	Disagree f(%)	Strongly Disagree f(%)	Mean	SD	Mean Decision (2.5)
I can efficiently use word processing and spreadsheet software.	130 (34.2%)	160 (42.1%)	60 (15.8%)	30 (7.9%)	3.03	0.89	Accepted
I am able to search for academic information effectively.	140 (36.8%)	150 (39.5%)	60 (15.8%)	30 (7.9%)	3.05	0.87	Accepted
I can evaluate the credibility of online information sources.	120 (31.6%)	160 (42.1%)	70 (18.4%)	30 (7.9%)	2.96	0.91	Accepted

Statement	Strongly Agree f(%)	Agree f(%)	Disagree f(%)	Strongly Disagree f(%)	Mean	SD	Mean Decision (2.5)
I can use email and communication tools professionally.	135 (35.5%)	155 (40.8%)	60 (15.8%)	30 (7.9%)	3.02	0.88	Accepted

Discussions

Table 1 highlights the types of digital literacy competencies of undergraduate students such as; productivity software usage, academic information search, evaluation of online sources, and professional communication. The findings reveal relatively high levels of agreement across all dimensions, suggesting that undergraduates in the study area possess foundational digital skills that support their academic engagement. A significant proportion of respondents (34.2% strongly agree; 42.1% agree) indicated confidence in using word processing and spreadsheet software, yielding a mean score of 3.03 (SD = 0.89).

The mean score of responses across the four scale of measurement which was higher than the criteria mean of 2.5. Therefore this finding is accepted and it proofs that most undergraduates could handle basic productivity tools essential for academic tasks such as writing essays, creating presentations, and conducting simple data analyses. Similar results were found in a study by Okon and Akpan (2023), who reported that over 70% of Nigerian undergraduates demonstrated proficiency in Microsoft Office applications, largely due to the integration of ICT courses in general studies curricula. However, gaps remain, as 23.7% either disagreed or strongly disagreed, implying a need for targeted training.

Regarding the ability to search for academic information effectively, 36.8% strongly agreed and 39.5% agreed, producing the highest mean score (3.05, SD = 0.87). The obtained mean scored was higher than the bench mark of 2.5 and therefore the finding was accepted. This reflects strong competence in online information retrieval, a finding consistent with Yusuf (2022), who observed that Nigerian undergraduates widely rely on online scholarly databases, search engines, and institutional repositories for coursework and research projects. Nevertheless, the persistence of 23.7% disagreement suggests that some students may struggle with search strategies such as Boolean operators or database navigation. As emphasized by Head (2023), students often exhibit “surface-level searching,” which hinders access to high-quality scholarly materials despite their apparent digital fluency.

In terms of evaluating the credibility of online sources, the responses were slightly less positive, with 31.6% strongly agreeing and 42.1% agreeing, while 26.3% expressed disagreement. The mean score (2.96, SD = 0.91), the obtained mean score is also higher than the bench mark of 2.5 and the finding is accepted which indicates moderate competence, suggesting that while many students could distinguish credible sources from unreliable ones, a substantial minority face challenges.

This aligns with international findings by Fraillon et al. (2020), who noted that even digitally active students often lack advanced critical literacy skills to evaluate bias, authority, and reliability of online content. Omeluzor and Oyovwe-Tinuoye (2021) similarly emphasized that students are more adept at accessing online materials than at critically appraising their quality, which poses risks for academic integrity and misinformation exposure.

Finally, professional use of communication tools such as email reflected strong competence, with 35.5% strongly agreeing and 40.8% agreeing, giving a mean score of 3.02 (SD = 0.88). This suggests that most undergraduates are confident in using digital communication appropriately for academic and professional purposes. This finding aligns with Alhassan (2023), who reported that email remains the primary mode of formal digital interaction between Nigerian students and lecturers. However, the 23.7% disagreement highlights a minority who may still default to informal communication styles in academic contexts, underscoring the need for digital etiquette training.

Findings

Table 2 : Level of Digital Literacy Skills of Undergraduate Students

Statement	Strongly Agree f(%)	Agree f(%)	Disagree f(%)	Strongly Disagree f(%)	Mean	SD	Mean Decision (2.5)
I feel confident using various digital platforms.	125 (32.9%)	150 (39.5%)	70 (18.4%)	35 (9.2%)	2.96	0.92	Accepted
I frequently update my knowledge of digital tools.	120 (31.6%)	160 (42.1%)	70 (18.4%)	30 (7.9%)	2.97	0.90	Accepted

Statement	Strongly Agree f(%)	Agree f(%)	Disagree f(%)	Strongly Disagree f(%)	Mean	SD	Mean Decision (2.5)
I can troubleshoot basic technical issues.	110 (28.9%)	150 (39.5%)	80 (21.1%)	40 (10.5%)	2.87	0.95	Accepted
I can navigate learning management systems confidently.	130 (34.2%)	155 (40.8%)	65 (17.1%)	30 (7.9%)	3.01	0.89	Accepted

Discussions

Table 2, presents data on the levels of digital literacy skills among undergraduate students. The results reflect relatively strong competencies across four domains: use of digital platforms, updating knowledge of digital tools, troubleshooting, and navigating learning management systems (LMS). However, moderate disagreement levels suggest uneven proficiency and potential skill gaps. Confidence in using digital platforms received the strongest endorsement, with 32.9% strongly agreeing and 39.5% agreeing (mean = 2.96, SD = 0.92). This implies that most undergraduates are comfortable with diverse platforms such as e-learning portals, online collaboration tools, and social media for academic purposes. This finding aligns with Statista, (2022), who reported that Nigerian undergraduates exhibit high confidence in using platforms like Google Classroom, Zoom, and WhatsApp for academic communication, particularly after the COVID-19 pandemic accelerated e-learning adoption. Nonetheless, 27.6% disagreement highlights that a minority remain digitally excluded, often due to limited prior exposure or infrastructural challenges.

A slightly stronger response was observed regarding the regular updating of knowledge of digital tools, with 31.6% strongly agreeing and 42.1% agreeing (mean = 2.97, SD = 0.90). This suggests that a majority of students engage in continuous digital learning, often informally through peer interaction, online tutorials, or self-exploration. This resonates with the findings of UNESCO (2021), which stressed that young adults are increasingly adopting lifelong learning approaches to adapt to rapidly changing technologies. However, the 26.3% who disagreed indicate that not

all students are proactive in digital upskilling, raising concerns about digital inequality.

Troubleshooting skills emerged as the least endorsed competency, with 28.9% strongly agreeing and 39.5% agreeing, but 31.6% expressing disagreement (mean = 2.87, SD = 0.95). This shows that while many students can solve basic technical issues such as internet connectivity problems or software installation, a sizable proportion struggle with such skills. Omotayo and Haliso (2020) similarly observed that Nigerian undergraduates demonstrate high usage of ICT tools but limited problem-solving ability, often relying on peers, technicians, or institutional ICT support. These findings emphasize the need for structured ICT training programs that go beyond usage to develop troubleshooting and critical thinking skills.

The strongest area of competence was navigating learning management systems, with 34.2% strongly agreeing and 40.8% agreeing (mean = 3.01, SD = 0.89). This reflects high familiarity with digital academic environments, a skill reinforced by universities' adoption of Moodle, Canvas, and other platforms for assignment submissions and course management. This aligns with findings by Bond et al. (2021), who noted that digital learning during and after the pandemic enhanced LMS competencies among students worldwide. Nonetheless, 25% disagreement suggests that some undergraduates still face difficulties with LMS, often due to inadequate training or unstable internet connectivity.

Findings

Table 3 : Challenges in the Acquisition of Digital Literacy Skills

Statement	Strongly Agree f(%)	Agree f(%)	Disagree f(%)	Strongly Disagree f(%)	Mean	SD	Mean Decision (2.5)
Lack of reliable internet limits my skills.	145 (38.2%)	150 (39.5%)	60 (15.8%)	25 (6.6%)	3.09	0.84	Accepted
Insufficient training hinders my digital skills.	130 (34.2%)	160 (42.1%)	65 (17.1%)	25 (6.6%)	3.04	0.86	Accepted

Statement	Strongly Agree f(%)	Agree f(%)	Disagree f(%)	Strongly Disagree f(%)	Mean	SD	Mean Decision (2.5)
High cost of devices prevents me from improving skills.	150 (39.5%)	140 (36.8%)	65 (17.1%)	25 (6.6%)	3.09	0.85	Accepted
Limited availability of training programs affects learning.	135 (35.5%)	150 (39.5%)	70 (18.4%)	25 (6.6%)	3.04	0.87	Accepted

Discussions

Table 3 identifies the key challenges that hinder undergraduates in the Federal Capital Territory (FCT), Nigeria, from acquiring digital literacy skills. The findings emphasize structural, financial, and institutional barriers, showing that while students recognize the importance of digital literacy, many are constrained by lack of resources and training opportunities. A significant 77.7% of respondents (mean = 3.09, SD = 0.84) strongly agreed or agreed that lack of reliable internet limits their ability to develop digital literacy skills. This indicates that access to stable connectivity remains a critical barrier to digital learning. According to Adedoja and Ajiboye (2021), inadequate broadband penetration and frequent network disruptions in Nigerian universities restrict students' ability to access online educational resources. Similarly, Oyediran et al. (2020) found that poor internet infrastructure during the COVID-19 lockdown negatively affected students' participation in e-learning, highlighting the systemic challenges of digital adoption in Nigeria.

Insufficient training was also a major barrier, with 76.3% of respondents acknowledging that inadequate guidance hinders their digital skills development (mean = 3.04, SD = 0.86). This aligns with the findings of Yusuf and Balogun (2021), who argued that while many Nigerian students own digital devices, limited formal instruction on their effective use results in shallow digital competencies. Internationally, Hatlevik et al. (2018) similarly reported that students without structured digital training struggle to build higher-order ICT skills, which limits their academic and professional readiness. Financial constraints were another critical

issue, with 76.3% of students agreeing that the high cost of digital devices prevents them from improving their skills (mean = 3.09, SD = 0.85).

This reflects a socioeconomic divide in access to technology, where affordability determines students' ability to practice and expand their digital literacy. Aderibigbe and Oladele (2020) also noted that economic challenges significantly influence students' capacity to acquire laptops or updated smartphones, thereby limiting digital inclusiveness. Globally, Selwyn (2016) described this as a "digital inequality" issue, where socioeconomic status continues to shape technology adoption and skill acquisition among students.

Finally, 75% of respondents agreed that limited availability of training programs at their institutions affects learning progress (mean = 3.04, SD = 0.87). This points to institutional shortcomings in embedding digital literacy into curricula. Olayemi and Adebayo (2021) found that many Nigerian universities still treat ICT training as optional rather than integral, resulting in uneven skill development. Voogt and Pareja Roblin (2018) highlighted that higher education institutions worldwide often lack structured digital literacy programs, leaving students to rely on self-directed learning.

Summary of Findings

1. Undergraduate students possess moderate digital literacy skills such as using productivity software, searching for academic information, evaluating sources, and using communication tools, but a notable proportion struggle with critical evaluation of online information.
2. The level of digital literacy among undergraduates is relatively high, with many students' expressing confidence in using digital platforms, updating knowledge, troubleshooting issues, and navigating learning management systems.
3. Challenges limiting digital literacy acquisition include lack of reliable internet, insufficient training opportunities, high cost of devices, and limited institutional programs.

Conclusion

The study concludes that undergraduates in FCT demonstrate considerable digital literacy and awareness of internet security practices, which positively affect their academic and online engagements. However, persistent challenges such as

inadequate infrastructure, limited training, and financial barriers constrain the full development and application of digital literacy skills. Addressing these challenges will not only improve safe internet practices but also strengthen academic outcomes in the digital era.

Recommendations

1. Universities should strengthen training programs to improve students' critical evaluation of online information.
2. Continuous capacity-building initiatives should be encouraged to help students update their digital skills and troubleshoot technical challenges.
3. Stakeholders should address barriers such as poor internet access, high device costs, and lack of structured digital literacy programs through targeted policy interventions.

References

Adedoja, G., & Ajiboye, J. O. (2021). Digital literacy in Nigerian universities: Challenges and opportunities. *African Journal of Education and Information Management, 22*(1), 45–60.

Aderibigbe, N. A., & Oladele, M. A. (2020). Socioeconomic barriers to ICT adoption among undergraduates in Southwest Nigeria. *Journal of Educational Technology Systems, 49*(2), 234–249.

Aina, L. O. (2020). Digital skills for employability in Nigeria: Challenges and prospects. *Journal of Education and Practice*, 11(12), 45-53.

Afolabi, O. E., & Afolabi, O. E. (2024). Digital literacy skills and attitude of undergraduates towards use of e-resources in selected universities in Ogun State, Nigeria. *Communicate: Journal of Library and Information Science*, 26(1), 99–114.

Adeoye, A. A., & Adeoye, B. J. (2017). Digital Literacy Skills of Undergraduate Students in Nigeria Universities. *Library Philosophy and Practice (e-journal)*, 1665.

Adegbija, M. V., & Bola, K. B. (2021). Digital inequality and access to online learning in Nigeria's higher education. *African Educational Research Journal, 9*(2), 305–312.https://doi.org/10.30918/AERJ.92.21.042

Akpan, C. P., & Essien, U. M. (2021). Mainstreaming digital literacy in the university curriculum in Nigeria. *Journal of Educational Technology and Curriculum Development, 4*(1), 18–26.

Alhassan, J. A. (2023). Email communication practices among Nigerian undergraduates: Professionalism and academic engagement. *Nigerian Journal of Educational Technology, 6*(1), 44–57.

Bankole, O. M. (2022). Perceptions Towards Adoption of Online Learning Under COVID-19 Pandemic Among Library and Information Science Students. European Journal of Interactive Multimedia and Education, 3(2), e02210. https://doi.org/10.30935/ejimed/12271

Basheer, A., & Krishna, R. (2022). Digital literacy in rural India: Opportunities and challenges. *International Journal of Education and Development using ICT*, 18(1), 45-60.

BusinessDay. (2023, November 16). 85% of Nigerian graduates have no digital skills GetBundi. *BusinessDay NG*. https://businessday.ng/technology/article/85-of-nigerian-graduates-have-no-digital-skills-getbundi/

Bayrakcı, M., & Narmanlıoğlu, H. (2021). Examination of digital literacy skills of undergraduate students according to various variables. *International Journal of Education and Literacy Studies*, 9(3), 1–10.

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2021). Emergency remote teaching in higher education: A study of digital competence gaps. *Educational Technology Research and Development, 69*(2), 123–145.

Eze, S. C., & James, T. O. (2020). Understanding the challenges of digital literacy in multilingual communities in Nigeria. *Journal of African Languages and Technological Advancement, 3*(2), 45–59.

Fraillon, J., Ainley, J., Schulz, W., Duckworth, D., & Friedman, T. (2020). *Preparing for life in a digital world: IEA International Computer and Information Literacy Study 2018 International Report*. Springer.

Gabra, S. G., Dantsoho, M. A., & Mustapha, S. A. (2020). Assessment of cybersecurity awareness among students of federal universities in

Northwestern Nigeria. *ATBU Journal of Science, Technology and Education (ATBU-JOSTE)*, 8(1), 188–198. https://www.atbuftejoste.net/index.php/joste/article/view/1147

Garba, A. A., Siraj, M. M., Othman, S. H., & Zogaan, W. A. (2021). Cybersecurity Awareness of University Students in Nigeria: Analysis Approach. *Turkish Journal of Computer and Mathematics Education*, 12(12), 3739–3752.

Getbundi,C., (2023) Technology, Engineering and Mathematics and Digital Skill Education.Info@getbundi.com

Kraemer-Mbula, Erika, & Sacha Wunsch-Vincent. (2021) *The Informal Economy in* Developing Nations Hidden Engine of Innovation? *Cambridge University Press*. doi:10.1017/CBO9781316662076.

Krejcie, R.V., & Morgan, D.W., (1970). Determining Sample Size for Research Activities.*Educational and Psychological Measurement.*

Haruna, M., Joseph, A. M., & Mohammed, H. A. (2024). Assessment of digital literacy skills among undergraduate students of Ahmadu Bello University, Zaria. *Library Philosophy and Practice*, 7421. https://digitalcommons.unl.edu/libphilprac/7421/

Hatlevik, O. E., Guðmundsdóttir, G. B., & Loi, M. (2018). Digital competence, self-efficacy and sources of support among upper secondary students. *Computers & Education, 120*, 38– 50.

Head, A. J. (2023). The critical evaluation gap: Undergraduate students and online research practices. *Journal of Information Literacy, 17*(2), 1–18.

Nguyen, L. (2020). Cybersecurity awareness and education: Challenges and recommendations. *Information & Computer Security*, 28(2), 194–213.

Okokpujie, K. O., Kennedy, C. G., Nnodu, K., & Noma-Osaghae, E. (2023). Cybersecurity awareness: Investigating students' susceptibility to phishing attacks for sustainable safe email usage in academic environment (A case study of a Nigerian leading university). *International Journal of Sustainable Development and Planning*, 18(1), 255–263.

Okpa, U. J. (2025). Digital literacy skills in southern Nigerian tertiary institutions. *International Research Journal of Multidisciplinary Stud ies, 7*(2), 1–15.

Omeluzor, S. U., & Oyovwe-Tinuoye, G. O. (2021). Information literacy skills and online information credibility among undergraduates in Nigeria. *Library Philosophy and Practice, 2021*(5278), 1–15.

Omotayo, F., O., & Halisco, A., R., (2020) Perception of Task- Technology fit of Digital Libraries among Undergraduates I Selected Universities in Nigeria. The Journal of Academic Librarianship; 46(1); 1-10 pp.

Okon, E., & Akpan, I. (2023). ICT competencies of undergraduates in Nigerian universities: Implications for digital literacy. *African Journal of Library, Archives and Information Science, 33*(2), 125–138.

Oyediran, W. O., Omoare, A. M., Owoyemi, M. A., Adejobi, A. O., & Fasasi, R. B. (2020). Prospects and limitations of e-learning application in private tertiary institutions amidst COVID-19 lockdown in Nigeria. *Heliyon, 6*(11), e05457.

Olayemi, A., & Adebayo, S. (2021). Integrating digital literacy into higher education curricula in Nigeria: Challenges and policy implications. *Journal of Higher Education Policy and Management, 43*(6), 657–673.

Sulaiman, I. O., & Makinde, O. O. (2024). Artificial intelligence in higher education: Impact on students' cybersecurity awareness. *KIU Journal of Social Sciences*,10(1),67–76. https://www.ijhumas.com/ojs/index.php/kiujoss/article/view/290

Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). Bloomsbury Academic.

Statista.(2022).Internet usage in Nigeria-Statisitcs ad facts. https://www.statista.com/statistics

Udoh, I. U., Ekpenyong, G. E., & Olowookere, O. (2020). Digital Literacy Skills of Undergraduate Students of Library and Information Science on the Utilization of Electronic Information Resources in Two Federal Universities in Nigeria. *Library Philosophy and Practice (e-journal)*, 4269.

UNESCO. (2021). *Digital literacy for youth: Policy brief*. UNESCO Institute for Lifelong Learning. https://unesdoc.unesco.org

Umar, M. Y. & Dangwaran, T. Y., (2023) Exploring the Relationship between Digital literacy and Electronic Information Resources Use among Undergraduate Students of Gombe State University. *Library Philosophy and Practice* (e- journal). 7815. https://digitalcommons.unl.edu/libphilprac/78 15

Van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*,72,577-588. https://doi.org/10.1016/j.chb.2017.03.010

Voogt & Pareja (2018) Teachers Conceptualization and Enactment of Twenty-first Century Competencies: Exploring Dimensions for New Curriculum. *The CurriculumJournal*; 29(1) https://doi.org/1080/9585176.2017.1369136

World Bank. (2021). *Digital skills: A foundation for inclusive digital transformation*. https://www.worldbank.org/en/topic/digitaldevelopment/publication/digital-skills

Yusuf, M. O., & Balogun, M. R. (2021). ICT literacy and competencies of Nigerian university students: Implications for academic performance. *Education and Information Technologies, 26*(3), 2883–2899.