Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Digital Rights Literacy Skills and Data Safety Practices of Private Secondary Schools in Ilorin Metropolis

S. B Ajala

sodiq.ajala01@gmail.com

Al-Hikmah University

A. O Olasupo

Al-Hikmah University

Research Article

Keywords: digital rights literacy skills, data safety practices, private secondary schools, Ilorin metropolis

Posted Date: November 20th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11318802/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

This study examined the relationship between digital right literacy skills and data safety practices among private secondary school teachers in Ilorin Metropolis, Kwara State, Nigeria. Three questions were raised to guide the aim of the study. The study adopted a quantitative, correlational survey design, and the study data were collected from 50 private secondary school teachers selected through convenience sampling, using a structured questionnaire administered via Google Forms. Data were analysed using mean and standard deviation for the descriptive research questions and Pearson Product-Moment Correlation for the relationship between variables. Findings revealed a generally moderate-to-high level of digital rights literacy and a generally high level of data safety practice, with routine protective behaviours more established than active oversight behaviours. A statistically significant, positive was found between digital rights literacy and data safety practices, indicating that higher literacy was associated with stronger safety practice. The study recommends targeted, procedure-focused training and clearer institutional reporting structures within private secondary schools, and calls for further research using larger, more representative samples.

Introduction

The use of digital technology for different purposes in the modern world has greatly benefited mankind immensely. Its use has transformed how people live, interact, work and grow. In education, it has revolutionised learning by introducing new modes of learning (Yıldız, 2025), increased access to teaching and learning resources (World Bank, 2020) while enhancing flexibility, collaboration and engagement across diverse educational settings. Furthermore, Integrating technology into education provides students with an engaging learning experience, allowing them to remain more interested in the subject without being distracted (Haleem et al., 2022). This suggests that digital technology remains a powerful tool in education through enriched learning experiences and improved access to learning materials.

Singh (2024) add that digital technology is a valuable instrument for advancing inclusive education, especially in underdeveloped nations. This position is strengthened by Singun (2025) who contends that digital innovation may enhance and assist education, accelerating the process of ensuring that everyone has access to high-quality education. Accordingly, Timotheou et al. (2023) opine that the nature and breadth of education have changed as a result of digital technology, and educational institutions throughout the world have adopted new strategies.

The use of digital technology requires specific skills as the inability to develop these skills could hinder the use of digital technologies in schools. In line with this, Afriliandhi et al. (2022) argue that to comprehend and utilise information from a variety of sources accessed via computers, laptops, or mobile phones, educators need to be highly digitally literate. This suggests that educators have a great role to play in disseminating learning using digital technology. Accordingly, Li et al. (2025) add that teachers' digital competency is widely acknowledged as a key component of educational digitalisation,

with a rising focus on creative teaching methods rather than skill development. This view represents the consensus scholarly position that the educational benefits of digital technology are largely dependent on teachers' competence as technological investments alone are unlikely to improve learning outcomes without the pedagogical knowledge and confidence required to integrate digital tools meaningfully into teaching practice. Although Umah et al. (2026) argue that teacher digital competence is the strongest predictor of digital inclusion, the competence of teachers in Nigeria and similar developing countries is constrained by minimal support, inadequate infrastructure and lack of professional development training (Adamu & Awodiji, 2026). As a result, this influences the digital literacy of teachers operating in this context as many may struggle to develop and sustain competencies required to effectively integrate digital technologies into teaching and learning activities.

Digital literacy level varies among teachers operating within private and public-school contexts. This according to, Akram et al. (2025), is largely attributed to funding, infrastructure and availability of continuous development program. Accordingly, Tabieh et al. (2021) add that teachers in the private sector are more digitally literate than those in the public sector. Furthermore, Demissie et al. (2022) indicate that compared to public schools, which are mainly underfunded, private schools offer professional development and digital infrastructure, which affects teachers' digital capabilities.

In addition to digital literacy skills, data safety practices have been identified to be an important component of digital technology in schools. According to Sadiku et al. (2021), digital safety is a component of cyber security that addresses people's comfort, convenience, and privacy levels when using the internet. Within the school setting, it is referred to as the precautions, practices, and policies implemented to protect educational stakeholders from potential online threats (Martin et al., 2019). With this, it is evident that data safety practices are highly important as the lack of these could introduce threats that could affect the entire digital infrastructure of an academic learning environment. Similarly, these practices incorporate guide teachers in protecting their personal information, privacy, and responsible behaviour while engaging in online activities (Canonizado, 2026).

Despite growing recognition of the importance of digital literacy and digital safety in education, existing studies have largely examined these concepts independently or within broader discussions of educational technology adoption. Limited attention has been given to understanding how teachers' digital literacy skills influence their data safety practices, particularly within private school contexts in developing countries such as Nigeria. This represents an important gap because teachers with inadequate digital literacy may be less capable of identifying online risks, implementing appropriate security measures and modelling safe digital behaviour for learners. Given the increasing reliance on digital technologies in schools and the unique resource conditions associated with private educational institutions, there is a need to investigate the relationship between digital literacy skills and data safety practices among private school teachers. Therefore, this study examines the relationship between digital right literacy skills and data safety practices among private school teachers in Ilorin metropolis.

Research Questions

The aim of the study is to examine the relationship between digital literacy skills and data safety practices among private school teachers in Nigeria. The following questions are raised to guide the study:

1. What is the level of digital rights literacy skills among teachers in private secondary schools in Ilorin metropolis?

2. What is the level of data safety practices among teachers in private secondary schools in Ilorin metropolis?

3. What is the relationship between digital rights literacy skills and data safety practices among teachers in private secondary schools in Ilorin metropolis?

Literature Review

Digital literacy represents more than technical proficiency with hardware and software. ut includes the key dispositions, abilities, attitudes, and knowledge required to find, assess, produce, and disseminate information in digital contexts in a safe and responsible manner. (Ogegbo, 2023). For Rani (2025), digital literacy indicates having the skills that one needs to live, learn, and work in an e-permeated society and economy. Accordingly, digital rights are legal concerns that surface on the Internet and different software platforms. (Annabi, 2024). From these definitions, digital rights literacy can be said to be the knowledge, skills, awareness and critical understanding that enable individuals to recognise, exercise, protect and advocate for their rights and responsibilities within digital environments. This is very important for teachers in the modern world as Zou et al. (2025) indicate that modern teachers increasingly integrate digital technology in their practice. Thus, it is expected of teachers to understand how to ensure privacy, safety and protection of the personal information of their student while respecting intellectual property. This positions digital literacy and digital safety as overlapping rather than parallel professional competencies, a relationship the present study investigates directly.

Previous studies conducted in Nigeria acknowledge the usefulness of technology integration in teaching and learning (Mbaying et al., 2025; Ogwu et al., 2023). However, there are concerns regarding the digital literacy of teachers as researchers like Nimfel (2022) point out that many teachers lack knowledge and skills to use digital technologies. This, according to Onasanya et al. (2025), is largely attributed to inadequate infrastructure, limited access to devices and insufficient training to integrate digital tools effectively. Ogegbo (2023) found that most teachers at the "Integrator" proficiency band, experimenting confidently with digital tools but still developing consistent pedagogical strategies, with proficiency notably weaker in organisational communication and in protecting sensitive digital content than in general resource use. In another study, Akinsola and Omotayo (2026) reveal that although teachers demonstrated moderate competence in using digital technologies, gaps remained, in certain dimensions. This suggests that while technology adoption is increasing within Nigerian educational institutions, many teachers may still lack the comprehensive digital competencies required to navigate the complex ethical, legal and safety issues associated with digital environments.

Unlike digital rights, digital safety is a branch of cyber security that deals with people and the levels of online comfort, convenience, and privacy (Sadiku et al., 2021). Much of the Nigerian empirical literature on this construct has, however, concentrated on students rather than teachers. Garba et al. (2021) and Osijirin et al. (2026) both found only moderate cybersecurity awareness among Nigerian tertiary students, with persistent gaps in understanding password security, phishing and data privacy despite near-universal device ownership. Whether such findings extend to teaching staff, a population with different responsibilities, training histories and professional incentives, is rarely tested directly in Nigerian research, leaving a gap this study addresses by focusing specifically on private secondary school teachers.

Protection Motivation Theory (PMT), proposed by Rogers (1975) offers a coherent lens for explaining why digital literacy might shape, without guaranteeing, safety practice. PMT holds that protective behaviour follows from threat appraisal (judging a danger's severity and likelihood) and coping appraisal (weighing one's own capability, the recommended precaution's effectiveness, and its costs). Chou and Chou (2016), applying PMT specifically to in-service teachers, found that strengthening teachers' coping self-efficacy was necessary but insufficient to reduce risky online behaviour; its effect depended on perceived social norms and, for response efficacy, on gender. Digital literacy maps naturally onto the coping-appraisal component: literate teachers are better positioned to recognise threats and believe they can respond effectively, which PMT predicts should translate into safer practice, but only where institutional and social conditions reinforce that motivation. Oguine et al. (2025) applied the same framework to Nigerian adolescents' online safety, lending contextual relevance to PMT within Nigeria's digital environment more broadly.

Contextual conditions particular to Nigeria plausibly shape both constructs. Infrastructural reports point to uneven device access, unreliable connectivity, and limited professional development, particularly outside major urban centres Regulatory obligations have also shifted, as the Nigeria Data Protection Act (2023) now designates schools as data controllers, yet survey evidence suggests awareness of this framework remains low even among educated groups, extending to private-school proprietors themselves. Despite these developments, no identified Nigerian study has examined digital literacy and digital safety practice as jointly measured, related constructs among private secondary school teachers specifically; existing evidence addresses either general ICT competence or student-level cybersecurity awareness in isolation. This concentration on technology adoption rather than safe use, and on students rather than the teachers expected to model safe behaviour, constitutes the specific gap the present study addresses.

Methodology

Research Design

The study employed a quantitative, correlational survey design. According to Slater and Hasson (2025), quantitative research designs centre on numerical data collection and analysis to answer the research

question or hypothesis. This research design is appropriate for this study as it attributes numerical value to the study variables. In addition, since the study seeks to examine the relationship between digital rights literacy and data safety practices, the use of correlational form of quantitative research supports the systematic measurement of both variables and enables the researcher to determine the nature and strength of the relationship between them.

Population of the Study

The target population comprised all teachers employed in private secondary schools across Kwara State, Nigeria. Given the impracticality of accessing the full target population, the accessible population was delimited to private secondary school teachers within Ilorin Metropolis, from which the study's participants were drawn.

Sample and Sampling Technique

Fifty private secondary school teachers within Ilorin Metropolis constituted the study sample, recruited through convenience sampling. Respondents were included on the basis of their accessibility to the researcher and their willingness to participate, rather than through any procedure designed to yield statistical representativeness.

Research Instrument

A structured questionnaire served as the sole instrument for data collection. It comprised a demographic section and is followed by two substantive sections corresponding to the study's core constructs. These are digital rights literacy skills and data safety practices. Responses to both substantive sections were captured on a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5).

Data Collection Procedure

Data were collected electronically via a Google Forms questionnaire, disseminated through WhatsApp to reach private secondary school teachers within Ilorin Metropolis. Participation was entirely voluntary, and respondents were briefed on the study's purpose prior to completion. Informed consent was obtained from all participants, and confidentiality and anonymity were assured throughout, with responses used exclusively for the purposes of this research.

Method of Data Analysis

The researcher employed descriptive and inferential statistics in analysing the data collected for the study. Means and standard deviations were used in answering the first and second objectives. Since descriptive statistics are used to summarize data in an organized manner (Kaur et al., 2018), the use of mean and standard deviation allowed the researcher to present a summary of the data collected on the level of digital rights skills and data safety practices among teachers. The third research question was

answered using Pearson Product Moment Correlation (PPMC), as this tool enabled the researcher to assess the relationship between digital rights literacy skills and data safety practices among teachers in private secondary schools in Ilorin metropolis.

Results

Research Question One: What is the level of digital rights literacy skills among teachers in private secondary schools in Ilorin metropolis?

Table 1
Mean and Standard Deviation of Respondents' Digital Rights Literacy Skills

S/N	Item	Mean	SD
1.	**I understand that personal information should only be shared with people who have a legitimate reason to access it.**	**3.44**	**0.884**
2.	I understand the importance of privacy when handling students' personal information.	3.36	0.985
3.	I understand what digital rights mean in the context of using digital technologies.	3.32	0.999
4.	I can distinguish between appropriate and inappropriate sharing of students' information online.	3.40	0.881
5.	I understand the importance of protecting digital accounts used to access students' or school information.	3.28	1.031
6.	I understand the importance of obtaining appropriate consent before using students' personal information for certain purposes.	3.26	0.853
7.	I understand that individuals have rights concerning the collection and use of their personal information.	3.20	1.161
8.	I know that personal information should not be collected or used without an appropriate purpose.	3.18	1.119
9.	I understand that convenience does not justify sharing personal information through an insecure digital platform.	3.18	0.850
10.	I can identify information that should be treated as personal or sensitive information.	3.12	0.895
11.	I can recognise situations in which a person's digital privacy may have been violated.	3.12	0.940
12.	I understand that photographs or videos showing identifiable students can constitute personal information.	3.10	0.886
13.	I know that individuals can raise concerns when their personal information is improperly handled.	3.08	0.944
14.	I understand the risks associated with sharing students' personal information through digital platforms.	3.04	0.880
15.	I know where to seek help or report concerns relating to misuse of personal information in my school.	2.90	0.909

Source: Author (2026)

Table 1 presents the mean and standard deviation of respondents' digital rights literacy skills across fifteen items. The item with the highest mean was "personal information should only be shared with people who have a legitimate reason to access it," M = 3.44. By contrast, the only item to fall below the criterion mean of 3.00 was "I know where to seek help or report concerns relating to misuse of personal

information in my school," M = 2.90, indicating a mild disagreement tendency and pointing to a specific area of weaker literacy: awareness of institutional reporting or escalation pathways, rather than conceptual understanding of privacy itself.

Research Question Two: What is the level of data safety practices among teachers in private secondary schools in Nigeria?

Table 2
Mean and Standard Deviation of Respondents' Data Safety Practices

S/N	Item	Mean	SD
1.	**I use a password or other security measure to protect devices that I use for school-related activities.**	**3.70**	**0.839**
2.	I avoid entering school or student information into unfamiliar websites or applications.	3.52	0.814
3.	I use security features such as screen locks on devices containing school-related information.	3.50	1.074
4.	I avoid sharing my passwords for accounts used for school-related activities.	3.44	0.972
5.	I avoid leaving devices containing students' or school information unattended and unlocked.	3.42	0.950
6.	I change my passwords when I suspect that they may have been compromised.	3.40	1.010
7.	I check links or attachments before opening them when they are received through email or messaging platforms.	3.36	0.985
8.	I avoid posting identifiable information about students on social media without appropriate permission.	3.34	1.062
9.	I avoid sending sensitive student information through public or unsecured digital channels.	3.30	1.035
10.	I consider the privacy and security implications before sharing personal information digitally.	3.30	1.093
11.	I exercise caution before downloading files or applications onto devices used for school activities.	3.24	1.080
12.	I take precautions when using public Wi-Fi to access school-related information.	3.20	0.948
13.	I delete or dispose of digital records containing personal information when they are no longer needed, in accordance with school procedures.	3.16	0.766
14.	I report suspected loss, unauthorised access or inappropriate disclosure of school or student information to the appropriate person.	3.16	1.076
15.	I check the privacy or security settings of digital platforms that I use for school-related activities.	3.10	0.863

Source: Author (2026)

Table 2 presents the mean and standard deviation of respondents' data safety practices across fifteen items. The highest-rated item was "I use a password or other security measure to protect devices," M = 3.70, the single highest mean recorded across both constructs, suggesting that basic device-level password protection is the most consistently practised safety behaviour among respondents.

Comparatively strong means were also recorded for avoiding unfamiliar websites (M = 3.52) and using screen locks (M = 3.50). The comparatively lowest-rated item was "I check the privacy or security settings of digital platforms that I use for school-related activities," M = 3.10, followed closely by record disposal and incident reporting both at M = 3.16. Although none of the fifteen items fell below the criterion mean, the pattern suggests that more passive or habitual protective behaviours (password use, device locking) were reported more strongly than behaviours requiring ongoing vigilance or active oversight (checking settings, reporting incidents, appropriate disposal of records).

Research Question Three: What is the relationship between digital rights literacy skills and data safety practices among teachers in private secondary schools in Nigeria?

Table 3
Pearson Product-Moment Correlation between Digital Rights Literacy Skills and Data Safety Practices

Variables	N	dF	r value	p value
Digital rights literacy skills				
	50	48	.315	.02
Data safety practices				

Table 3 shows a Pearson correlation coefficient of r = .315 (p = .026, N = 50) between digital rights literacy skills and data safety practices. Because the obtained p-value (.026) is less than the stated significance threshold of .05, the relationship is statistically significant at the 0.05 level. The positive sign of the coefficient indicates that higher digital literacy scores were associated with higher data safety practice scores among respondents.

Discussion

The finding that respondents reported an overall moderate-to-high level of digital rights literacy (composite mean ≈ 3.20), with particular weakness in knowing where to seek help or report misuse of personal information, suggests that teachers in the sample possess a reasonably solid conceptual grounding in privacy-related ideas but are less confident about the institutional or procedural dimension of digital rights.

This pattern resonates with that of Ogegbo (2023) which reveal that teachers clustering at an intermediate ("Integrator") level of digital competence on the DigCompEdu framework, with the lowest-scoring domain being professional/organisational engagement rather than general digital skill. When compared with the current study, conceptual or operational literacy tends to outpace literacy around institutional processes and communication channels. This is a plausible, literature-supported observation rather than a claim that the two studies measured identical constructs, since Ogegbo's instrument assessed general digital pedagogical competence whereas the present study assessed rights-specific literacy.

The comparatively low awareness of reporting pathways also aligns with the broader Nigerian regulatory picture described by Ugbedeojo (2025), which found that awareness of the country's data protection framework remained low even among highly educated groups. This suggests the weakness observed here is not idiosyncratic to the sampled teachers but may reflect a wider gap in institutional communication about data protection recourse within the Nigerian private education sector.

Respondents reported a generally high level of data safety practice (composite mean ≈ 3.34), with the strongest behaviour being basic password or security-measure use on devices (M = 3.70) and the weakest being active monitoring behaviours such as checking privacy/security settings, disposing of records appropriately, and reporting suspected breaches.

This finding offers a notable point of contrast with earlier Nigerian evidence on password-related behaviour. Garba et al. (2021) and Osijirin et al. (2026), both examining cybersecurity awareness among Nigerian tertiary students, reported persistent gaps specifically in password security knowledge and practice. The present study's teacher respondents, by contrast, rated password-related protection as their strongest safety behaviour.

The statistically significant, positive, but modest correlation ($r = .315$, $p = .026$) indicates that respondents who reported higher digital rights literacy also tended to report somewhat stronger data safety practices, though the association is far from a strong one, and a considerable proportion of the variation in safety practice remains unexplained by literacy alone.

Conclusion

This study set out to examine digital rights literacy skills, data safety practices, and the relationship between them among private secondary school teachers in Ilorin Metropolis, Kwara State. The findings indicate that respondents possessed a generally moderate-to-high level of digital rights literacy, with particular weakness in awareness of institutional reporting pathways for privacy concerns. Similarly, respondents reported a generally high level of data safety practice, with routine, device-level behaviours such as password use more strongly established than active oversight behaviours such as checking security settings or reporting suspected breaches. A statistically significant, positive, but modest correlation was found between the two constructs, indicating that teachers with stronger digital literacy tended to report somewhat stronger safety practices, without implying that literacy alone determines safe behaviour. The study contributes context-specific evidence on an under-researched population, private secondary school teachers. within the Nigerian digital literacy and digital safety literature, while underscoring that literacy and practice, though related, remain distinct areas requiring separate attention.

Recommendations

Based on the findings, private school administrators should establish and clearly communicate institutional procedures for reporting concerns about the misuse of personal or student information,

addressing the specific gap identified in teachers' awareness of reporting pathways. School authorities should also implement targeted training that goes beyond conceptual understanding of digital rights to include practical, procedural skills such as reviewing platform privacy settings, appropriately disposing of digital records, and responding to suspected data breaches. Given that routine security behaviours were already reasonably well established, training resources may be more efficiently directed toward reinforcing less-practised, higher-vigilance behaviours. Given the modest strength of the observed relationship between literacy and practice, interventions should not assume that improving literacy alone will substantially improve safety practice; complementary institutional support, clear policies, and periodic reinforcement are also necessary. Future research should extend this inquiry to larger, more diverse samples across Kwara State and other Nigerian regions using probability sampling.

Declarations

Ethics Approval and Standard Followed

The protocol was approved by the Ethics Committee of the Department of Educational Management and Guidance and Counselling, Al-Hikmah University, Ilorin, Nigeria, co-chaired by the Head of Department, Dr J. Yusuf and Prof. O. P Akinnuibi, in accordance with the Nigerian ethical and legal standards for research involving human participants, including the Nigeria Data Protection Act 2023.

This study, titled “Digital Rights Literacy Skills and Data Safety Practices of Private Secondary Schools in Ilorin Metropolis,” was conducted in accordance with Nigerian ethical and legal standards for research involving human participants, including the Nigeria Data Protection Act 2023. Ethical approval was granted by the Ethics Committee of the Department of Educational Management and Guidance and Counselling, Al-Hikmah University, Ilorin, Nigeria, headed by the Head of Department. The study was carried out in private secondary schools in the Ilorin Metropolis, Kwara State, Nigeria.

Consent to Participate

Informed consent was obtained from all participants, who were school leaders in the participating private secondary schools. A consent statement was included as an introduction to the questionnaire, explaining the purpose of the study, that participation was voluntary, that responses would be kept confidential and anonymous, and that respondents could withdraw at any time. Participants indicated their consent by proceeding to complete the questionnaire.

Human Ethics and Consent to Participate Declarations

This study involved human participants. It was approved by the Ethics Committee of the Department of Educational Management and Guidance and Counselling, Al-Hikmah University, Ilorin, Nigeria, and informed consent was obtained from all participants, as described above.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Clinical Trial Number

Clinical trial number: not applicable.

Data Availability Statement

All data generated or analysed during this study are included in this published article [and its supplementary information files].

References

1. Adamu CD, Awodiji OA. Digitally mediated professional development of Nigerian teachers intending to relocate abroad: Implications for school leaders. Front Educ. 2026;11:1847574. https://doi.org/10.3389/feduc.2026.1847574.
2. Afriliandhi C, Hidayati D, Istiqomah I, Melawati A. Teacher's Digital Literacy to Improve Quality in Learning. IJECA (International J Educ Curriculum Application). 2022;5(1):17. https://doi.org/10.31764/ijeca.v5i1.7327.
3. Akinsola A, Omotayo O. (2026). *ASSESSMENT OF TEACHERS' DIGITAL COMPETENCE AND THE INFLUENCE OF TEACHING EXPERIENCE IN PUBLIC SECONDARY SCHOOLS IN IJEBU ZONE, OGUN STATE, NIGERIA*. *9*, 53–66.
4. Akram R, Ahmad M, Cheema AB. Comparing the Digital Learning Practices in Public and Private Schools. Qlantic J Social Sci. 2025;6(3):149–59. https://doi.org/10.55737/qjss.vi-iii.25395.
5. Annabi A. Digital rights (future perspectives and horizons). Int J Adv Res Humanit Law. 2024;1(2):1–14. https://doi.org/10.63053/ijrel.7.
6. Canonizado IC, MEDIA EXPOSURES AND DIGITAL SAFETY PRACTICES OF, THE KEY STAGE 2 LEARNERS. *International Journal of Education Humanities and Social Science*, *09*(01), 1371–1391. https://doi.org/10.54922/IJEHSS.2026.1226
7. Chou H-L, Chou C. An analysis of multiple factors relating to teachers' problematic information security behavior. Comput Hum Behav. 2016;65:334–45. https://doi.org/10.1016/j.chb.2016.08.034.
8. Demissie EB, Labiso TO, Thuo MW. Teachers' digital competencies and technology integration in education: Insights from secondary schools in Wolaita Zone, Ethiopia. Social Sci Humanit Open. 2022;6(1):100355. https://doi.org/10.1016/j.ssaho.2022.100355.
9. Garba A, Sirat M, Othman S. Cybersecurity Awareness of University Students in Nigeria: Analysis Approach. Turkish J Comput Math Educ (TURCOMAT). 2021;12:3739–52.
10. Haleem A, Javaid M, Qadri MA, Suman R. Understanding the role of digital technologies in education: A review. Sustainable Oper Computers. 2022;3:275–85. https://doi.org/10.1016/j.susoc.2022.05.004.

11. Kaur P, Stoltzfus J, Yellapu V. Descriptive statistics. Int J Acad Med. 2018;4(1):60. https://doi.org/10.4103/IJAM.IJAM_7_18.
12. Li Y, Zhang X, Chen M. The Path From Digital Competence to Adaptive Use: An Empirical Analysis of 9,726 Primary and Secondary School Teachers. Int J Chin Educ. 2025;14(3):2212585X251409386. https://doi.org/10.1177/2212585X251409386.
13. Martin F, Gezer T, Wang C. Educators' Perceptions of Student Digital Citizenship Practices. Computers Schools. 2019;36(4):238–54. https://doi.org/10.1080/07380569.2019.1674621.
14. Mbaying O, Etorti I, Otu A. (2025). *Digital Technology Integration into Educational Instruction Delivery in the Nigerian Context: Promises, Perils, and Panaceas*. https://doi.org/10.56201/ijee.v11.no3.2025.pg222.232
15. NIMFEL TN. (2022). *DIGITAL TECHNOLOGY SKILLS REQUIRED FORTEACHINGAND LEARNING OF BUSINESS EDUCATION COURSESINTERTIARY INSTITUTIONS IN PLATEAU STATE*. *9*(1), 158–168.
16. Ogegbo AA. Assessing the Proficiency level in Digital Competences of Secondary. School Sci Teachers. 2023;19(2):40–57.
17. Oguine MB, Oguine OC, Badillo-Urquiola K, Okunade OA. (2025). *'Teens Need to Be Educated on the Danger': Digital Access, Online Risks, and Safety Practices Among Nigerian Adolescents* (Version 1). arXiv. https://doi.org/10.48550/ARXIV.2507.08914
18. Ogwu EN, Emelogu NU, Azor RO, Okwo FA. Educational Technology Adoption in Instructional Delivery in the New Global reality. Educ Inform Technol. 2023;28(1):1065–80. https://doi.org/10.1007/s10639-022-11203-4.
19. Onasanya HI, Fadeyibi I, Jayeola B. (2025). *Navigating Technological Integration: Digital Transformation and the Challenges of Educators in Nigeria*.
20. Osijirin A, Sada S, Edmond V, Anigbo L. Artificial Intelligence in Safety Education and Training: A Conceptual Review of Applications, Learning Processes and Outcomes. World J Innov Mod Technol. 2026;10:212–30. https://doi.org/10.56201/wjimt.v10.no4.2026.pg212.230.
21. Rani PG. Digital Literacy: How It Has Been Evolving? Its Significance in the Indian Context. Mod Econ. 2025;16(04):655–80. https://doi.org/10.4236/me.2025.164031.
22. Rogers RW. A Protection Motivation Theory of Fear Appeals and Attitude Change1. J Psychol. 1975;91(1):93–114. https://doi.org/10.1080/00223980.1975.9915803.
23. Sadiku MNO, Ashaolu TJ, Ajayi-Majebi A, Musa SM. Digital Safety. Int J Sci Adv. 2021;2(5). https://doi.org/10.51542/ijscia.v2i5.21.
24. Singh, V. (2024). *Digital Education for Promotion of Inclusion in Education* SSRN. https://doi.org/10.2139/ssrn.4889249.
25. Singun A. Unveiling the barriers to digital transformation in higher education institutions: A systematic literature review. Discover Educ. 2025;4(1):37. https://doi.org/10.1007/s44217-025-00430-9.

26. Slater P, Hasson F. Quantitative Research Designs, Hierarchy of Evidence and Validity. J Psychiatr Ment Health Nurs. 2025;32(3):656–60. https://doi.org/10.1111/jpm.13135.
27. Tabieh AAS, Hamzeh M, Abu-Foudeh B, Kh S, Jarrar N, Al-Manaseer S, Al-Shawabkeh A, Seikaly R. Digital Literacy and its Acquisition by Teachers and Principals at Educational Workplaces. Int J Learn Teach Educational Res. 2021;20(5):38–55. https://doi.org/10.26803/ijlter.20.5.3.
28. Timotheou S, Miliou O, Dimitriadis Y, Sobrino SV, Giannoutsou N, Cachia R, Monés AM, Ioannou A. Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. Educ Inform Technol. 2023;28(6):6695–726. https://doi.org/10.1007/s10639-022-11431-8.
29. Ugbedeojo SV. (2025). *Data Protection and Compliance in Nigeria: Challenges and Opportunities*. SSRN. https://doi.org/10.2139/ssrn.5236705
30. Umah DN, Ezeagwu PC, Anumaka CI, Osijirin AN. Education and Digital Inclusion in Sub-Saharan Africa: Evidence from Nigeria in Bridging Regional Inequalities. J Adv Educ Philos. 2026;10(02):25–33. https://doi.org/10.36348/jaep.2026.v10i02.003.
31. World Bank. (2020). *Digital Technologies in Education*.
32. Yıldız T. The Future of Digital Education: Artificial Intelligence, the Metaverse, and the Transformation of Education. İstanbul Üniversitesi Sosyoloji Dergisi / İstanbul Univ J Sociol. 2025;44(2):969–88. https://doi.org/10.26650/SJ.2024.44.2.0664.
33. Zou Y, Kuek F, Feng W, Cheng X. Digital learning in the 21st century: Trends, challenges, and innovations in technology integration. Front Educ. 2025;10:1562391. https://doi.org/10.3389/feduc.2025.1562391.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Digitalliteracyrights.sav