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DIGITAL LITERACY SKILLS AND ONLINE SAFETY PRACTICES AMONG GENERATION Z IN KWARA STATE, NIGERIA

By

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Abstract
Generation Z (born 1997–2012) constitutes a significant and growing proportion of internet users in Nigeria, yet empirical data on their digital literacy levels and online safety practices remain scarce, particularly in North-Central states such as Kwara. This study investigated digital literacy skills and online safety practices among Generation Z students in Kwara State, Nigeria. Adopting a descriptive survey research design, data were collected from 387 students across six tertiary institutions in Kwara State using a structured, validated questionnaire. The instrument measured four dimensions of digital literacy information literacy, communication literacy, technical skills, and critical digital thinking alongside five online safety domains: privacy management, password hygiene, phishing awareness, cyberbullying response, and social media safety. Descriptive statistics (means, standard deviations, and frequencies) and inferential statistics (independent-samples t-test and one-way ANOVA) were employed for data analysis. Results revealed that respondents exhibited a moderate overall level of digital literacy (Grand Mean = 2.91), with technical skills scoring highest (M = 3.21) and critical digital thinking the lowest (M = 2.48). Online safety practices were generally moderate (Grand Mean = 2.37), with password hygiene being the weakest area (M = 2.09). Statistically significant differences were found in digital literacy levels by gender ($t = 2.84$, $p = .005$) and institution type ($F = 4.17$, $p = .016$). The study recommends that Institutions should integrate critical digital thinking and information evaluation skills into the curriculum to complement students' existing technical and communication competencies.

Keywords: *Digital literacy, Online safety, Generation Z, Kwara State, Nigeria, Cybersecurity, Social media, Internet use*

Introduction

The emergence of the internet as a pervasive social infrastructure has fundamentally restructured how young people learn, communicate, and participate in civic life. Generation Z, broadly defined as individuals born between 1997 and 2012, are the first cohort to have grown up in an environment saturated with digital technologies, social media platforms, and mobile internet access (Kring, 2018). Unlike prior generations who experienced a transition to the digital world, Gen Z individuals are regarded as digital natives, a term that, while contested, reflects their early and habitual engagement with networked technologies from childhood (Avinç & Doğan, 2024).

In Nigeria, the expansion of mobile internet infrastructure has accelerated digital participation across age groups, with the Nigerian Communications Commission (NCC, 2024) reporting over 157.5 million active internet subscribers as of March 2023, a figure that continues to rise. Within this rapidly digitalising landscape, young people aged 18–26 (who correspond broadly to Gen Z) represent a dominant demographic of internet users, accessing online services primarily through smartphones. Despite this heightened connectivity, studies consistently reveal significant disparities between frequency of internet use and the depth of digital competencies among Nigerian youth (Onjewu et al., 2025).

Digital literacy encompassing the ability to find, evaluate, create, and communicate information using digital technologies has increasingly been recognised as a core 21st-century competency, comparable in importance to traditional reading and numeracy skills (Law et al. 2018). Beyond functional use of devices and applications, digital literacy involves the critical capacity to navigate online environments safely, discern misinformation, protect personal data, and engage responsibly across digital platforms (Cho, Eun-ho et al., 2022). In the context of rapidly proliferating online risks including phishing attacks, cyberbullying, identity theft, and exposure to harmful content online safety knowledge and practices constitute an especially critical sub-dimension of digital literacy for young people.

Kwara State, located in North-Central Nigeria with Ilorin as its capital, presents a particularly significant setting for this inquiry. The state hosts several tertiary institutions including the University of Ilorin, Kwara State University (KWASU), Kwara State Polytechnic, and Kwara State College of Education, giving it a substantial population of young, educated Gen Z learners. Recent government initiatives such as the Kwara Coding and Digital Literacy Programme (KCDLP), which trained 5,604 secondary school students across 50 public schools between August 2024 and October 2025, reflect a growing recognition of the importance of digital skills development. Nevertheless, systematic empirical data on the digital literacy levels and online safety behaviours of the state's tertiary-level Gen Z population remains conspicuously absent from the scholarly literature.Several Nigerian studies have explored aspects of digital literacy and online safety, including Olubori and Adisa's (2025) study of media literacy and online fraud awareness at Kwara State University, and Oguine et al.'s (2025) work on online risks and safety practices among Nigerian adolescents. However, the existing literature is fragmented, rarely integrates multiple dimensions of digital literacy and online safety, and seldom focuses specifically on the tertiary-level Gen Z cohort in Kwara State. This study therefore seeks to address this gap by providing a comprehensive empirical account of digital literacy skills and online safety practices among Generation Z students in Kwara State, Nigeria.

Statement of the Problem

Despite the expanding digital footprint of young Nigerians, the gap between internet access and genuine digital competence remains wide. In Kwara State, there is a paucity of empirical data specifically targeting Gen Z tertiary students' digital literacy levels and online safety habits. This knowledge gap hinders the development of evidence-based curricula, targeted policy interventions, and institutional capacity-building programmes. Without reliable baseline data, efforts by government agencies, educational institutions, and civil society to improve digital literacy are likely to remain insufficiently targeted and ineffective.

Objective of the Study.

The specific objectives of this study are:

1. To assess the level of digital literacy skills among Generation Z students in Kwara State.
2. To determine the extent of online safety practices among Generation Z students in Kwara State.
3. To examine whether significant differences exist in digital literacy levels based on gender.
4. To examine whether significant differences exist in digital literacy levels based on institution type.
5. To explore the relationship between digital literacy skills and online safety practices among the respondents.
6. To identify barriers to digital literacy and online safety among Generation Z students in Kwara State.

Research Questions

1. What is the level of digital literacy skills among Generation Z students in Kwara State?
2. What is the extent of online safety practices among Generation Z students in Kwara State?
3. What are the major barriers to digital literacy and online safety among Generation Z students in Kwara State?

Research Hypotheses

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

H01: There is no significant difference in digital literacy levels between male and female Gen Z students in Kwara State.

H02: There is no significant difference in digital literacy levels across institution types (university, polytechnic, college of education).

H03: There is no significant relationship between digital literacy skills and online safety practices among Gen Z students in Kwara State.

Literature Review

Concept of Digital Literacy

The concept of digital literacy has evolved considerably since Gilster (1997) first coined the term to describe the ability to understand and use information in multiple formats from a wide range of sources accessed via computers (see Tinmaz et al., 2022, for a systematic review). Contemporary scholarship recognises digital literacy as a multidimensional construct encompassing not only technical skills but also cognitive, social, and ethical dimensions of digital engagement. Law et al. (2018) Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 identifies six competency areas: problem solving, information literacy,

communication and collaboration, digital content creation, safety, and technical operations. The Digital Competence Framework for Citizens (DigComp 2.2) developed by the European Union similarly outlines five interconnected areas of digital competence, including information and data literacy, communication and collaboration, digital content creation, safety, and problem solving (Vuorikari et al., 2022).

In the Nigerian context, the National Digital Literacy Framework (NDLF), published by the National Information Technology Development Agency (NITDA) in 2023, defines digital literacy as a set of skills that enables citizens to access, understand, create, and critically evaluate digital content and use digital tools to participate meaningfully in the digital economy. The NDLF adopts a broad conception that aligns with the UNESCO framework, emphasising digital citizenship, online safety, and digital productivity alongside basic ICT skills. These policy frameworks reflect a growing consensus that digital literacy is not reducible to knowing how to operate a device or navigate a social media platform, it involves the critical, creative, and safe use of digital environments.

Generation Z and Digital Technology Use in Nigeria

Generation Z's relationship with technology is characterised by habitual, multi-platform, and mobile-first engagement. In Nigeria, Onjewu, Godwin, Azizsafaei, and Appiah (2025) examined the influence of technology use on learning skills among Generation Z in Nigeria and the United Kingdom, finding that while Nigerian Gen Z individuals demonstrate high social media engagement, smartphone usage paradoxically undermined certain academic learning skills, a finding attributed in part to the predominance of passive content consumption over active, critical digital engagement. Similarly, the De Simone and Manolio (2019) Digital Skills in Nigeria report found that while smartphone penetration has accelerated internet access, foundational digital competencies such as information evaluation, data management, and online security awareness remain low across the youth population.Within Kwara State specifically, a study by Bello and Ajao (2024) at Igbaja, a rural community in the state documented significant barriers to digital literacy among secondary school youth, including limited device access (60.3%), insufficient skills (14.7%), and poor internet connectivity (13.2%). At the tertiary level, Olubori and Adisa (2025) examined 392 students at Kwara State University and found that while most students reported frequent social media use, their media literacy competencies particularly in the domains of analysis and evaluation were insufficient to protect them from common online fraud practices such as phishing, romance scams, and fake investment schemes.

Online Safety Practices Among Young Nigerians

Online safety encompasses a broad range of behaviours and attitudes that protect individuals from digital harms including identity theft, cyberbullying, data breaches, scams, and exposure to harmful content. Research across Africa and specifically in Nigeria consistently identifies young people as both the most active and most vulnerable group of internet users in relation to online risks. A major empirical study by Oguine et al. (2025), surveying 409 secondary school adolescents across Nigeria's Federal Capital Territory, found that exposure to inappropriate content and online scams were the most commonly reported risks, while many adolescents responded to risks with inaction or minimal defensive measures due to limited digital safety knowledge.

Studies focusing specifically on Kwara State reveal a concerning pattern of cybersecurity unawareness. A study conducted at the University of Ilorin and Kwara State University found that 76% of respondents were unaware of existing cybersecurity policies, while 80% of cybercafé administrators reported that users routinely ignored available security measures (Aliyu, et al., 2021). A more recent analysis of internet crimes among undergraduates at the University of Ilorin by Balogun et al. (2024) found that a substantial proportion of students had either perpetrated or been victims of internet-related offences, highlighting the dual dimension of digital vulnerability and unethical digital behaviour within this population.

Password hygiene, a fundamental component of online safety, is widely reported as inadequate among Nigerian university students. Many students use weak passwords, reuse passwords across platforms, and rarely enable two-factor authentication (Adeshola & Oluwajana, 2025). Cyberbullying awareness and response capacity among Nigerian youth also appear limited; while most students are aware that cyberbullying occurs, few know how to report incidents through official channels or utilise platform-specific tools effectively (Oguine et al., 2025).

Theoretical Framework

This study is anchored primarily in two complementary theoretical frameworks: the Digital Divide framework and the Technology Acceptance Model (TAM). The Digital Divide framework, originally conceptualised by van Dijk (2006) and

subsequently elaborated in the context of skills disparities (Hargittai, 2002), distinguishes between access divides (who can connect) and skills divides (who can use digital tools effectively and safely). This framework directly informs the study's research design in two ways: first, it grounds the selection of four digital literacy sub-dimensions (information literacy, communication literacy, technical skills, and critical digital thinking) as hierarchically organised competencies, with higher-order skills such as critical evaluation built upon, rather than independent of, foundational technical access; second, it provides the theoretical rationale for examining group differences in digital literacy across gender and institution type, as the Digital Divide framework predicts that structural inequalities will manifest as differential skill acquisition across socio-demographic categories. The positive correlation observed between digital literacy and online safety (H03) is interpreted through this lens: online safety competencies are treated as higher-order digital skills that are enabled byand therefore co-vary withfoundational digital literacy. The Technology Acceptance Model (Davis, 1989; Venkatesh & Davis, 2000) supplements this framework by explaining the gap between awareness and behaviour in online safety practices. TAM posits that individuals are more likely to adopt a technology or protective behaviour when they perceive it as useful and easy to use (perceived usefulness and perceived ease of use). This model informs the interpretation of findings on password hygiene and two-factor authentication: the low adoption of these practices despite moderate awareness of online risks is consistent with TAM's prediction that perceived complexity (low ease of use) suppresses behavioural uptake. Together, the Digital Divide framework and TAM provide a coherent conceptual architecture: the former explains who is digitally competent and why group disparities exist, while the latter explains why competence does not always translate into safer online behaviour.

Methodology

This study adopted a descriptive survey research design. The target population of the study comprised all registered Gen Z students (aged 18–26, born between 1997 and 2006) enrolled in tertiary institutions in Kwara State, Nigeria, during the 2024/2025 academic session. Kwara State hosts six major tertiary institutions: the University of Ilorin (UNILORIN), Kwara State University (KWASU), Kwara State Polytechnic, Al-Hikmah University, and Kwara State College of Education. Using institutional enrolment figures and the Yamane (1967) formula for sample size determination at a 5% margin of error, a minimum sample size of 383 was calculated. To allow for attrition, the researchers targeted 420 respondents.

A multi-stage sampling technique was employed. In the first stage, purposive sampling was used to select six institutions representing different institution types (universities, polytechnics, and colleges of education) and ownership types (federal, state, and private). In the second stage, proportionate stratified random sampling was applied across departments, with faculties serving as strata, to ensure adequate representation of students from different academic backgrounds. In the third stage, systematic random sampling was used to select individual respondents within each faculty, using class lists as the sampling frame.

Data were collected using a structured questionnaire developed by the researchers, titled the Digital Literacy and Online Safety Questionnaire (DLOSQ). The DLOSQ was divided into three sections. Section A gathered demographic data including age, gender, institution, year of study, and frequency of internet use. Section B assessed digital literacy skills across four sub-scales: (i) Information Literacy (6 items), (ii) Communication Literacy (5 items), (iii) Technical Skills (6 items), and (iv) Critical Digital Thinking (5 items), yielding a total of 22 items. Section C assessed online safety practices across five sub-scales: (i) Privacy Management (5 items), (ii) Password Hygiene (4 items), (iii) Phishing Awareness (4 items), (iv) Cyberbullying Response (4 items), and (v) Social Media Safety (5 items), yielding a total of 22 items. All items in Sections B and C were rated on a four-point Likert scale: 4 = Always, 3 = Often, 2 = Rarely, 1 = Never.

The instrument was validated through expert review by three academic specialists in Information Science, Educational Technology, and Mass Communication. Content validity was assessed by examining the relevance, clarity, and representativeness of each item. The instrument was subsequently pre-tested with 30 students (not included in the main study) from Kwara State College of Education, Lafiagi. Reliability was assessed using Cronbach's alpha, yielding coefficients of 0.84 (digital literacy section) and 0.81 (online safety section), both exceeding the 0.70 threshold.

Data collection was conducted between September and November 2025. Research assistants were trained and deployed to each institution. Questionnaires were administered in person during class sessions, following institutional approvals and ethical clearances from the University of Ilorin Research Ethics Committee. Respondents were informed of the voluntary nature of participation, confidentiality of responses, and their right to withdraw at any time. A

total of 420 questionnaires were distributed; 405 were returned, and after screening for incompleteness, 387 were found valid and used for analysis, representing a valid response rate of 92.1%.

Data were analysed using IBM SPSS Statistics (Version 26). Frequencies and percentages were used to summarise demographic variables and responses to individual items. Means and standard deviations were computed for each sub-scale and the overall construct. For interpretive purposes, a mean score of 1.00–1.99 was classified as Low, 2.00–2.99 as Moderate, and 3.00–4.00 as High, following the three-tier Likert mean-score convention adopted in prior Nigerian survey research (see, e.g., Balogun et al., 2024; Olubori & Adisa, 2025), which mirrors the scale used by Owusu-Acheampong and Nkrumah-Boateng (2018). Although that citation originates from a Ghanaian context, the three-tier banding is widely applied across West African digital literacy studies and aligns with standard four-point Likert scoring conventions. It should further be noted that the digital literacy Grand Mean of 2.91 falls at the upper boundary of the Moderate band, near the High threshold (3.00), a proximity that warrants nuanced interpretation of the findings. Before conducting parametric tests, the assumptions of normality (Shapiro-Wilk) and homogeneity of variance (Levene's test) were verified; where minor deviations from normality were detected, the robustness of parametric tests at the achieved sample sizes ($n > 30$ per cell) was deemed sufficient, consistent with the central limit theorem. Levene's test confirmed equal variances across institution types; Tukey's HSD was therefore applied for post-hoc comparisons. An independent-samples t-test was used to test H01 (gender differences) and one-way ANOVA to test H02 (institution type differences). Pearson's product-moment correlation was used to test H03 (relationship between digital literacy and online safety). A significance level of $p < .05$ was applied throughout. Note on hypotheses alignment: the study formulates six research objectives and three research questions, of which three are tested inferentially via H01–H03. The sixth objectiveidentifying barriers to digital literacy and online safetyis addressed descriptively through Table 4 and intentionally generates no formal null hypothesis, reflecting its exploratory character. The third research question on barriers is correspondingly answered through frequency analysis rather than inferential testing, as no a priori group comparison was specified. Finally, regarding the study's population boundary: while Generation Z is broadly defined as individuals born between 1997 and 2012, the study's sampling frame encompasses tertiary students aged 18–26 at the time of data collection (born 1997–2006). This operationalisation reflects tertiary institution age-eligibility norms in Nigeria; the youngest Gen Z cohort (born 2007–2012) is excluded by design, and findings should be interpreted within this specific sub-cohort scope.

Results

Demographic Profile of Respondents

Table 1: Demographic Profile of Respondents (N = 387)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	198	51.2
	Female	189	48.8
Age Group	18–20 years	141	36.4
	21–23 years	176	45.5
	24–26 years	70	18.1
Institution Type	University (UNILORIN/KWASU/Al-Hikmah)	218	56.3
	Polytechnic (Kwara State Poly)	102	26.4
	College of Education (KWCOE)	67	17.3
Year of Study	100/200 Level (Pre-degree/ND I)	142	36.7
	300/400 Level (ND II/HND/300L)	162	41.9
	500 Level & Above / Postgraduate	83	21.4
Internet Access Device	Smartphone only	289	74.7

	Laptop/Desktop	42	10.9
	Both smartphone and laptop	56	14.4
Daily Internet Use	Less than 2 hours	58	15.0
	2–5 hours	183	47.3
	More than 5 hours	146	37.7

Source: Field Survey, 2025

As shown in Table 1, males constituted a slight majority (51.2%) of respondents. The majority (81.9%) fell within the 18–23 age bracket, consistent with the Gen Z demographic definition. Universities accounted for the largest proportion of respondents (56.3%), followed by polytechnic students (26.4%) and college of education students (17.3%). Smartphones were the primary internet access device for 74.7% of respondents, with only 10.9% using laptops or desktops exclusively. Notably, 37.7% reported spending more than five hours daily on the internet, reflecting high digital engagement.

Levels of Digital Literacy Skills

Research Question 1 sought to determine the level of digital literacy skills among Gen Z students. Table 2 presents descriptive statistics for each digital literacy sub-scale.

Table 2: Mean Scores and Standard Deviations for Digital Literacy Sub-Scales (N = 387)

Digital Literacy Dimension	No. of Items	Mean	SD	Remarks
Information Literacy	6	2.87	0.61	Moderate
Communication Literacy	5	3.08	0.57	High
Technical Skills	6	3.21	0.55	High
Critical Digital Thinking	5	2.48	0.70	Moderate
Overall	**22**	**2.91**	**0.54**	**Moderate**

Note: Mean remarks: Low = 1.00–1.99; Moderate = 2.00–2.99; High = 3.00–4.00. Source: Field Survey, 2025

The results in Table 2 indicate a moderate overall level of digital literacy among Gen Z students in Kwara State (Grand Mean = 2.91, SD = 0.54). Technical Skills was rated highest (M = 3.21, SD = 0.55), indicating that respondents were relatively proficient in basic device operation, installing applications, and navigating social media platforms. Communication Literacy was also rated high (M = 3.08, SD = 0.57), reflecting the frequent use of messaging applications and social media for peer communication. Conversely, Critical Digital Thinking was rated lowest (M = 2.48, SD = 0.70), with many students reporting that they rarely verify the authenticity of online information, evaluate source credibility, or critically interrogate the motives behind digital content they consume.

Online Safety Practices

Research Question 2 examined the extent of online safety practices. Table 3 presents descriptive statistics for each online safety sub-scale.

Table 3: Mean Scores and Standard Deviations for Online Safety Sub-Scales (N = 387)

Online Safety Dimension	No. of Items	Mean	SD	Remarks
Privacy Management	5	2.61	0.68	Moderate
Password Hygiene	4	2.09	0.74	Moderate
Phishing Awareness	4	2.34	0.66	Moderate
Cyberbullying Response	4	2.42	0.71	Moderate
Social Media Safety	5	2.39	0.65	Moderate
Overall	**22**	**2.37**	**0.59**	**Moderate**

Note: Mean remarks: Low = 1.00–1.99; Moderate = 2.00–2.99; High = 3.00–4.00. Source: Field Survey, 2025

Table 3 reveals that the overall level of online safety practices among the respondents was moderate (Grand Mean = 2.37, SD = 0.59). Privacy Management scored relatively higher (M = 2.61, SD = 0.68), suggesting that students demonstrate some basic awareness of account privacy settings. However, Password Hygiene was the lowest-rated

domain (M = 2.09, SD = 0.74), approaching the boundary of the low classification. This indicates that many respondents infrequently change their passwords, use weak or repeated passwords across platforms, and rarely enable two-factor authentication. Phishing Awareness (M = 2.34), Cyberbullying Response (M = 2.42), and Social Media Safety (M = 2.39) were all rated at moderate but comparatively low levels, indicating significant gaps in students' capacity to recognise and respond to common online threats.

Barriers to Digital Literacy and Online Safety

Respondents were asked to identify up to three major barriers to digital literacy and online safety from a provided list. Table 4 summarises the frequency of each barrier selected.

Table 4: Perceived Barriers to Digital Literacy and Online Safety (N = 387, Multiple Responses)

Barrier	Frequency	% of Respondents
High cost of internet data/subscriptions	289	74.7
Lack of formal digital literacy education in curricula	251	64.9
Insufficient personal devices (smartphones/laptops)	198	51.2
Low awareness of online risks and security tools	187	48.3
Unreliable or slow internet connectivity	176	45.5
Lack of guidance from lecturers/parents on online safety	142	36.7
Perceived complexity of security tools (e.g., 2FA, VPN)	131	33.8
Distrust of official cybersecurity information sources	89	23.0

Source: Field Survey, 2025

As shown in Table 4, the cost of internet data was the most frequently cited barrier (74.7%), reflecting the persistent economic challenge of internet affordability in Nigeria. The lack of formal digital literacy education in university/polytechnic curricula was identified by 64.9% of respondents, underscoring a systemic gap between the digital skills demands of modern society and the content of existing higher education programmes. Insufficient devices (51.2%) and low awareness of online risks (48.3%) were also prominently identified. Together, these barriers suggest that improving digital literacy and online safety among Gen Z in Kwara State requires a multi-pronged approach addressing both structural and educational dimensions.

Hypothesis Testing

H01: Gender Differences in Digital Literacy

An independent-samples t-test was conducted to determine whether significant differences existed in digital literacy levels between male and female Gen Z students. Results are presented in Table 5.

Table 5: Independent Samples t-Test; Digital Literacy by Gender

Group	Mean	SD	N	df	t-value	p	Decision
Male	3.04	0.51	198	385	2.84	.005	Reject
Female	2.77	0.56	189				

Source: Field Survey, 2025

Results in Table 5 show that male students (M = 3.04, SD = 0.51) scored significantly higher in digital literacy than female students (M = 2.77, SD = 0.56), t(385) = 2.84, p = .005. The null hypothesis H01 is therefore rejected. This finding is consistent with documented gender gaps in digital literacy in the Nigerian context (World Bank, 2024; NCC, 2024), where cultural norms, differential access to devices, and STEM participation gaps continue to disadvantage female students in digital competence acquisition.

H02: Institution Type Differences in Digital Literacy

A one-way ANOVA was conducted to compare digital literacy levels across institution types. Results are shown in Table 6.

Table 6: One-Way ANOVA; Digital Literacy by Institution Type

Group	Sum of Squares	df	Mean Square	f	p	Decision
Between Groups	4.812	2	2.406	4.17	.016	Reject
Within Groups	220.64	384	0.575			
Total	225.45	386				

Source: Field Survey, 2025

The ANOVA results reveal a statistically significant difference in digital literacy levels across institution types, F(2, 384) = 4.17, p = .016. Post-hoc Tukey HSD comparisons indicated that university students (M = 3.07) scored significantly higher than polytechnic students (M = 2.78) and college of education students (M = 2.74), while no significant difference was found between polytechnic and college of education students. H02 is accordingly rejected. The full pairwise results are presented in Table 6b. This disparity may reflect differences in infrastructure investment, faculty digital competence, and curriculum emphasis across institution types.

Table 6b: Post-Hoc Tukey HSD Pairwise Comparisons; Digital Literacy by Institution Type

Comparison (I vs. J)	MD (I−J)	SE	95% CI	p
University vs. Polytechnic	0.29*	0.08	[0.08, 0.50]	.013
University vs. Coll. of Education	0.33*	0.09	[0.07, 0.59]	.009
Polytechnic vs. Coll. of Education	0.04	0.10	[−0.19, 0.27]	.934

*Note. MD = mean difference. CI = confidence interval. * p < .05 (Tukey's HSD). Source: Field Survey, 2025*

H03: Relationship Between Digital Literacy and Online Safety

Pearson's product-moment correlation was calculated to assess the relationship between overall digital literacy scores and overall online safety practice scores.

Table 7: Pearson Correlation; Digital Literacy and Online Safety Practices

Variable	Mean	SD	N	Df	R	p	Decision
Digital Literacy	2.91	0.62	387	385	0.61	.000	Reject
Online Safety Practices	2.37	0.30					

Source: Field Survey, 2025

A statistically significant positive relationship was found between digital literacy and online safety practices, r(385) = 0.61, p < .001. This moderate-to-strong correlation indicates that students with higher digital literacy levels tend to

engage in more robust online safety behaviours. The null hypothesis H03 is rejected. This finding aligns with theoretical expectations drawn from the Digital Divide framework, which posits that higher-order digital skills (including safety competencies) are built upon, rather than independent of, foundational digital literacy.

Discussion

Digital Literacy Levels

The finding of a moderate overall digital literacy level (Grand Mean = 2.91) among Gen Z students in Kwara State is consistent with the national picture painted by the De Simone and Manolio, (2019), which documented widespread deficits in higher-order digital competencies across Nigerian youth despite high rates of smartphone use. The high rating for technical skills (M = 3.21) reflects the habitual engagement of Gen Z students with social media applications and mobile technologies, an engagement driven more by entertainment and communication than by deliberate skills acquisition. This pattern echoes what Buckingham (2015) describes as the distinction between media consumption and media literacy: using digital platforms fluently does not necessarily confer the critical, analytical, and evaluative capacities that constitute genuine digital literacy.The particularly low rating for critical digital thinking (M = 2.48) is a finding of significant concern. In an era of rampant misinformation, deepfakes, coordinated disinformation campaigns, and algorithmically curated content, the inability to critically evaluate digital information constitutes a serious civic and personal risk. This finding aligns with Breakstone et al.'s (2021) work on civic online reasoning, which found that even digitally active young people frequently struggle to distinguish credible sources from misinformation online. In the Nigerian context, where health misinformation, political disinformation, and online scams proliferate, this gap has direct consequences for individuals' health decisions, financial security, and democratic participation.

Online Safety Practices

The overall low-moderate level of online safety practices (Grand Mean = 2.37) is troubling given the documented prevalence of cybercrime in Nigeria. That 70.6% of respondents rarely or never use different passwords for different accounts, and 77.5% rarely or never enable two-factor authentication, reflects a widespread underestimation of personal cyber risk exposure. This finding corroborates Adeshola and Oluwajana (2025)’s observation that Nigerian college students frequently exhibit a significant gap between their stated awareness of online risks and their actual protective behaviours a discrepancy consistent with the optimism bias identified in health and risk psychology research.The relative strength of social caution (avoiding sharing personal details with strangers online) compared to technical safety practices (password hygiene, 2FA) suggests that online safety awareness among Gen Z in Kwara State is predominantly shaped by social norms and peer communication rather than formal cybersecurity education. Students appear to have internalised informal, socially transmitted caution around stranger interaction, but lack the structured, technical knowledge needed to protect themselves from non-person-based threats such as phishing attacks, malware, and data breaches.

Gender and Institutional Differences

The significant gender gap in digital literacy (male students scoring higher, $p = .005$) is a persistent finding in Nigerian and African digital skills research. The World Bank's (2024) national report and the NCC's (2024) baseline study on digital skills both document that women are systematically disadvantaged in digital competence acquisition due to a combination of structural factors (differential device ownership, STEM participation gaps), social factors (gendered norms around technology use), and educational factors (underrepresentation in ICT-intensive degree programmes). These findings have direct policy implications for the Kwara State Government's Girls Code Kwara initiative, which aims to increase female participation in technology to 60% by 2026, and argue for gender-responsive digital literacy curricula at the tertiary level.The advantage of university students over polytechnic and college of education students in digital literacy likely reflects differences in digital infrastructure, faculty digital competence, and the prevalence of technology-intensive courses within degree programmes. Universities in Kwara State particularly UNILORIN and Al-Hikmah University have made greater investments in digital learning infrastructure, including computer laboratories, Wi-Fi access, and digital library resources. These institutional resource differences underscore the need for equitable investment in digital infrastructure across all categories of tertiary institution.

The Digital Literacy & Online Safety Nexus

The significant positive correlation between digital literacy and online safety practices ($r = 0.61$, $p < .001$) confirms that digital literacy is not merely a precondition for but a predictor of safer online behaviour. This finding has important implications for intervention design: efforts to improve online safety practices among Gen Z are unlikely to be effective if they focus exclusively on rule-based safety instructions (e.g., 'do not share your password')

without simultaneously building the underlying digital literacy competencies that enable young people to understand why such rules matter and how to apply them flexibly across diverse digital environments.This finding resonates with the Technology Acceptance Model's emphasis on perceived usefulness: students are more likely to adopt security-enhancing behaviours when they understand the threats those behaviours protect against, and when they possess sufficient technical literacy to implement them without undue friction. Embedding online safety education within broader, competency-based digital literacy curricula rather than delivering it as a standalone awareness campaign is therefore a theoretically and empirically supported approach.

Conclusion

This study has provided original empirical data on digital literacy skills and online safety practices among Generation Z students enrolled in tertiary institutions in Kwara State, Nigeria. It is important to note that the sampling frame was restricted to registered tertiary students; findings should not be generalised to the broader Gen Z cohort in Kwara State, including out-of-school youth, who may exhibit different digital literacy profiles and structural barriers. The findings reveal moderate digital literacy overall, with comparatively high technical proficiency but notably weaker capacity for critical digital thinking ($M = 2.48$) and online safety practices—particularly in the areas of password hygiene ($M = 2.09$), phishing detection, and cyberbullying response. While all sub-scales fall within the adopted 'Moderate' classification band, several lower-boundary scores represent areas of specific concern warranting urgent intervention. Significant gender and institutional disparities in digital literacy were confirmed, and a meaningful positive correlation between digital literacy and online safety was established. These findings collectively indicate that Gen Z students in Kwara State, while highly connected, remain considerably under-prepared for the challenges of safe, critical, and productive digital citizenship.The study contributes to the empirical literature on digital literacy in the Nigerian context by providing Kwara State-specific data that can inform curriculum development, policy formulation, and institutional programming. It also advances theoretical understanding by confirming the digital literacy–online safety nexus and identifying the specific competency gaps that most urgently require attention.

Limitations

Several limitations of this study should be explicitly acknowledged. First, the sampling frame was restricted to registered students at six tertiary institutions in Kwara State; findings cannot be generalised to the broader Generation Z cohort, including out-of-school youth and those engaged in the informal sector, who may exhibit markedly different digital literacy profiles and face different structural barriers. Second, the study relied exclusively on self-reported questionnaire data to measure both digital literacy skills and online safety practices. Self-assessments of technical competencies are susceptible to overestimation and social desirability bias, which may inflate reported skill levels and the observed correlation between digital literacy and online safety. Third, the cross-sectional design precludes causal or directional inferences; the positive association between digital literacy and online safety should be interpreted as correlational. A third variable (e.g., academic engagement, socioeconomic status, or time online) could independently drive both constructs. Fourth, institution type as an independent variable is likely confounded with socio-demographic covariates such as device ownership, prior educational attainment, and socioeconomic status, which were not fully controlled for in the analysis; the observed institutional differences may therefore partly reflect pre-existing student demographics rather than the institutional environment per se. Fifth, the study was conducted within a single state, limiting geographical generalisability. Future research should employ mixed methods, longitudinal designs, and performance-based measures of digital competence to address these constraints.

Recommendations

Based on the findings, the following recommendations are offered:

1. Institutions should integrate critical digital thinking and information evaluation skills into the curriculum to complement students' existing technical and communication competencies.
2. Schools and stakeholders should implement structured digital safety training programmes focusing on password security, phishing detection, and cyberbullying management.
3. Government and stakeholders should address structural challenges by reducing internet costs, improving access to devices,

embedding digital literacy in curricula, and increasing awareness of online risks.

4. Targeted interventions such as digital inclusion programmes, mentorship, and access support for female students should be introduced to bridge the gender gap in digital literacy.

5. Polytechnics and colleges of education should receive improved digital infrastructure, updated curricula, and staff training to match university standards.

6. Efforts to improve online safety should prioritize enhancing overall digital literacy, since better digital skills naturally promote safer online behaviour.

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