



DIGITAL LITERACY SKILLS AND ACADEMIC ACHIEVEMENT: EVIDENCE FROM UNDERGRADUATE STUDENTS IN PUBLIC UNIVERSITIES

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Abstract

This study investigated the correlation between digital literacy skills and academic achievement of undergraduate students in Ambrose Alli University, Ekpoma, Nigeria. The study was guided by research questions and a hypothesis. A correlational research design was adopted. The population comprised all undergraduate students of Ambrose Alli University, from which a sample was determined using Yamane's formula for sample size calculation. The instrument for data collection was a structured questionnaire. Its reliability was determined via Cronbach's alpha, yielding a coefficient of 0.82, indicating high level of internal consistency. Data were analyzed using descriptive statistics (mean, standard deviation, frequency counts, percentages) and inferential statistic (Pearson's Product Moment Correlation). Findings revealed that undergraduate students demonstrated moderate levels of digital literacy skills, and their academic achievement profile varied across faculties. A significant positive correlation was established between digital literacy skills and academic achievement. The authors conclude that digital literacy skills were critical for enhancing undergraduates' academic success. It was recommended among others that universities should endeavor to invest in digital literacy training in order to foster students learning outcomes.

Keywords: Digital Literacy, Academic Achievement, Undergraduate Students, Higher Education, Nigeria, Ambrose Alli University, Information Communication Technology.

Introduction

The last two decades have witnessed an accelerated integration of digital technologies into higher education curriculum worldwide. Universities now depend on digital platforms for content delivery, assessment, research and communications; students are expected to navigate these technologies effectively to access information, collaborate, and demonstrate learning (UNESCO Institute for Statistics, 2018). The term digital literacy has therefore become central in discussions about student readiness and learning success. According to the Global Framework of Reference on Digital Literacy Skills, digital literacy encompasses the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies (UNESCO Institute for Statistics, 2018). In higher education, these competencies include not only basic operational skills (e.g., using word processors, file management) but also information-evaluation, academic search strategies, online communication, and ethical/safe behaviour in digital environments

(UNESCO Institute for Statistics, 2018; DEWR, 2021).

Academic achievement refers to the measurable performance outcomes of students in formal educational settings, typically assessed through grades, cumulative grade point average (CGPA), or standardized examination scores (Siddiq & Scherer, 2019). In universities, academic achievement serves as a key indicator of students' mastery of course content, cognitive skills, and the effective application of knowledge to solve problems (Hatlevik, Gudmundsdottir, & Loi, 2018). It reflects not only intellectual capability but also the ability to leverage learning resources, including digital tools, in the pursuit of educational goals.

The relationship between academic achievement and digital literacy has become increasingly significant in the 21st-century educational landscape, particularly in Nigerian universities where access to and effective use of digital technologies can influence learning outcomes (Adeoye & Afolabi, 2020). Students with higher digital literacy are better equipped to conduct research, evaluate online information critically, collaborate virtually, and complete digital-based assessments, all of which contribute positively to their academic results (Nwagu & Ossai, 2020). Thus, understanding the interplay between digital literacy and academic achievement is crucial for designing interventions aimed at improving student performance, particularly in institutions such as the Ambrose Alli University, Ekpoma, where digital resource availability and students' ICT competencies may vary.

The Nigerian higher-education provides a compelling setting for investigating this relationship. Nigeria's higher education system has made increasing, though uneven, investments in digital infrastructures, learning management systems and ICT training for students and staff. Nevertheless, national-level assessments and policy analyses emphasize persistent gaps: country-level digital literacy and basic literacy indices remain low relative to global averages, and there is uneven access to reliable internet connectivity, devices, and support services across regions and institutions (World Bank, 2025). The policy notes on adopting a national digital literacy framework in Nigeria underscores that while progress has been made, levels of digital skills in the population remain low and uneven, a situation that compounds educational inequalities and constrains the potential benefits of ICT investments in universities (World Bank, 2025).

The theoretical rationale for expecting a relationship between digital literacy and academic achievement rests on established learning theories. Self-regulated learning frameworks posit that students who can organize, seek, evaluate and employ information autonomously are more likely to set effective goals, monitor progress and select appropriate strategies, behaviours that are facilitated by digital competence in searching, evaluating and managing digital information (Zimmerman, 2002; Chen, 2025). Cognitive load theory similarly suggests that fluency with digital tools reduces extraneous load associated with operational tasks (e.g., struggling to use an Online Learning Management Systems (OLMS), formatting assignments), enabling learners to allocate cognitive resources to higher-order tasks that produce better learning outcomes (Sweller, 1988). In addition, digital literacies contribute to information literacy, an academic skill linked to the ability to locate, evaluate and integrate scholarly sources, which has been repeatedly associated with higher-quality assignments and better grades (Zhou, 2025).

Ambrose Alli University is a representative of many Nigerian universities undergoing digitization while contending with infrastructural and pedagogical challenges. Existing descriptive work at Ambrose Alli University (Ikenwe et al., 2022) provides evidence on the nature of students' digital practices, but it does not quantify the relationship between those practices and formal academic outcomes. There is therefore an empirical gap: a context-specific, correlational study at Ambrose Alli University that measures students' digital literacy comprehensively and examines its relationship with academic achievement (measured via GPA or equivalent) would fill a practical and scholarly need. Such a study would help determine whether efforts to enhance digital literacy at Ambrose Alli University are likely to translate into measurable academic gains, and which specific competencies (e.g., information-evaluation, OLMS use, and content creation) are most influential.

The intersection of rapid digitalization in higher education, the central role of digital literacy in enabling academic participation, and the persistence of access and skill gaps in Nigeria together justify an institution-focused investigation at Ambrose Alli University. This study therefore aims to investigate the relationship between undergraduate students' digital literacy skills and their academic achievement at Ambrose Alli University, Ekpoma.

Statement of the Problem

Digital technologies play an increasingly central role in higher education, requiring students to develop digital literacy skills to effectively navigate learning management systems, conduct research, and communicate online. Studies have linked digital literacy to improved academic performance and self-regulated learning, the strength of this relationship varies depending on access, institutional policies, and prior skills. In Nigeria, despite government efforts to integrate ICT into universities, challenges such as limited infrastructure, unequal access to devices, and insufficient digital training persist, resulting in inconsistent academic-focused digital competencies among students. At the Ambrose Alli University, preliminary observations show that there is a variation in students' digital literacy levels across faculties (Ikenwe et al., 2022). Yet it appears that most studies remain descriptive in nature, thereby failing to empirically examine whether digital literacy would correlate with measurable academic outcomes such as GPA. This research gap underscores the need for a context-specific study to empirically examine the interplay between digital literacy skills and academic achievement of undergraduates, hence this study.

Purposes of the Study

The purpose of this study was to examine the correlation between digital literacy skills and academic achievement of undergraduate students in Ambrose Alli University, Ekpoma, Nigeria. The study was guided by the following specific objectives:

1. To examine the level of digital literacy skills possessed by undergraduate students in Ambrose Alli University, Ekpoma, Nigeria.
2. To examine the academic achievement profile of undergraduate students in Ambrose Alli University, Ekpoma, Nigeria.

Research Questions

The study sought to answer the following questions:

Research Question 1: What is the level of digital literacy skills among undergraduate students in Ambrose Alli University, Ekpoma?

Research Question 2: What is the academic achievement profile of undergraduate students in Ambrose Alli University, Ekpoma?

Research Hypothesis

The following null hypothesis was formed and tested at a 0.05 level of significance:

Research Hypothesis: There is no significant correlation between digital literacy skills and academic achievement of undergraduate students in Ambrose Alli University, Ekpoma.

Theoretical Framework

Information Processing Theory is a cognitive learning theory that explains how humans acquire, store, and retrieve information. It was developed by Atkinson and Shiffrin (1968), who proposed that learning occurs through a sequence of mental stages; encoding, storage, and retrieval, similar to how a computer processes data. The theory emphasizes attention, perception, and memory as key mechanisms that determine how effectively information is understood and later recalled. The theory supports that academic achievement depends on how effectively learners can attend to, process, and

recall information. Digital literacy plays a critical role in this process. Students with strong digital skills are better equipped to manage the vast amount of information available online, filter irrelevant content, and store useful knowledge in long-term memory. Conversely, students with weak digital skills may struggle with information overload or fail to discern credible sources, leading to poor academic outcomes. This theoretical framework thus helps explain why digital literacy could be a strong predictor of academic achievement.

Method

Research Design

A correlational survey design was adopted for this study. It “involves collecting data to determine whether, and to what degree, a relationship exists between two or more quantifiable variables” (Gay, Mills & Airasian, 2009, p. 195). This type of design would, therefore, enable the authors to examine the relationship between the independent variable and dependent variable, without manipulating variables.

Participants and Sample

The population consisted of approximately 24,000 undergraduate students of Ambrose Alli University, Ekpoma. Using Yamane’s formula, a sample of 380 students was selected through multistage stratified random sampling to ensure representation across faculties and gender.

Instrument Validation and Reliability

The instrument for data collection is titled *Digital Literacy Skills and Academic Achievement Questionnaire (DLSAAQ)*, contained three sections, namely: demographic data, digital literacy items, and academic achievement (a self-reported CGPA). Digital literacy was assessed across six dimensions: information literacy, ICT skills, media literacy, communication and collaboration, problem-solving, and digital safety. Responses were measured on a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). The instrument was validated by experts in educational technology, and its reliability determined through a pilot test yielded a Cronbach’s alpha coefficient of 0.82, indicating high level of internal consistency.

Data Collection and Analysis

Data collection involved the physical administration of questionnaire during the lecture periods to ensure high response rates. Descriptive statistics (that is, means, standard deviations, frequencies) were used to summarize the data collected, while Pearson Product Moment Correlation, independent t-tests, and one-way ANOVA were used to test the hypotheses at a 0.05 level of significance. Out of the 380 questionnaires distributed, 362 were duly completed and analyzed, yielding a response rate of 95.3%. Respondents were evenly distributed by gender (48.1% male, 51.9% female) and primarily between the ages of 18 and 27 years.

Results

Research Question 1: What is the level of digital literacy skills among undergraduate students in Ambrose Alli University, Ekpoma?

Table 1: Mean Scores of Digital Literacy Skills Dimensions (N = 362).

Dimension	Items	Mean	SD	Interpretation
Information Literacy	4	4.11	0.78	High
ICT/Technical Skills	4	3.98	0.85	High
Media Literacy	4	3.65	0.92	Moderate
Communication & Collaboration	4	4.08	0.81	High
Problem-Solving & Creativity	4	3.72	0.88	Moderate
Digital Safety & Responsibility	4	3.90	0.80	High
Overall Digital Literacy Skills	24	3.91	0.85	High

Undergraduates at AAU demonstrate an overall *high level of digital literacy skills* ($M = 3.91$, $SD = 0.85$), with stronger competencies in information literacy ($M = 4.11$), communication, and ICT skills, but relatively weaker in media literacy and problem-solving ($M = 3.65$).

Research Question 2: What is the academic achievement profile of undergraduate students in Ambrose Alli University, Ekpoma?

Table 2: Distribution of Respondents by CGPA Category (N = 362).

CGPA Classification	Frequency	Percentage (%)
4.50 – 5.00 (First Class)	56	15.5
3.50 – 4.49 (Second Class Upper)	148	40.9
2.50 – 3.49 (Second Class Lower)	112	30.9
1.50 – 2.49 (Third Class)	36	9.9
Below 1.50 (Pass/Probation)	10	2.8

Most students fell within the Second-Class Upper (40.9%) and Second-Class Lower (30.9%) CGPA categories, suggesting moderate academic performance consistent with broader trends in Nigerian universities (Afolabi & Adeleke, 2021).

Research Hypothesis: There is no significant correlation between digital literacy skills and academic achievement of undergraduate students in Ambrose Alli University, Ekpoma.

Table 3: Pearson’s Correlation on the Interplay between Digital Literacy Skills and Academic Achievement of Undergraduate Students in Ambrose Alli University, Ekpoma.

Variables	r	p-value	Remark
Digital Literacy Skills & Academic Achievement	.421	.000	Significant

A moderate positive correlation ($r = .421$, $p < .05$) exists between digital literacy skills and academic achievement. This indicates that higher digital literacy is associated with better academic performance. Since $p < .05$, the hypothesis is rejected. Therefore, there is significant correlation between digital literacy skills and academic achievement of undergraduate students in Ambrose Alli University, Ekpoma, Nigeria. Pearson correlation analysis revealed a significant moderate positive relationship between digital literacy and academic achievement ($r = .421$, $p < .05$). This implies that as students’ digital literacy increases, so does their academic performance.

Discussions

Supportive evidence for this pattern comes from several large empirical studies and syntheses. Hatlevik et al. (2015) found that learners often show strong operational and information-seeking skills alongside weaker performance on higher-order digital tasks (e.g., critical evaluation, problem solving), a pattern they label “digital diversity.” This suggests students’ frequent use of digital tools (search engines, social media, communication apps) builds familiarity and routine operational competence, while tasks that require deeper critical evaluation or creative integration of multiple tools require explicit instruction and practice. Claro et al.’s (2018) TIDE work similarly emphasizes that teachers’ capacity to scaffold digital information tasks (not only basic use) is a major determinant of students’ higher-order digital competence, pointing to a pedagogical source for the gap between basic and advanced skills.

Meta-analytic and systematic reviews also align with this interpretation. Scherer and Siddiq’s (2019) meta-analysis shows that measures of ICT/digital literacy vary by SES, assessment type, and task demands, interactive, performance-based tasks tend to reveal larger gaps in higher-order competencies than self-reported measures of basic use. They noted that information literacy and basic ICT skills are more commonly measured and better-developed, while critical media literacy and problem-solving are less consistently present in curricula and therefore weaker among students.

Agina-Obu and Okwu (2023) report that Nigerian undergraduates commonly use digital tools for communication, basic research and library access, but they show limited ability to leverage those tools for advanced research tasks or to critically evaluate multimedia sources. Fakunle, Bakare and Adeyeye (2022) similarly found that digital literacy predicts library resource use (routine search/use), yet their measures flagged weaknesses when tasks required synthesis and complex application. These studies support the view that everyday exposure to communication and information tools (mobile phones, social media, LMS) explains the higher scores in information and communication dimensions, but formal instruction, scaffolded practice, and performance-based assessment are needed to develop media literacy and digital problem-solving.

There are also studies that nuance or challenge the simple “operational > critical” pattern. Ng (2012) argued that “digital natives” are not uniformly digitally literate and that explicit teaching can and does raise more advanced digital competencies; in other words, the gap observed here is not inevitable, targeted pedagogical interventions can close it. Claro et al. (2018) provide empirical backing: when instructors are able and trained to teach information-solving tasks (TIDE), students’ higher-order skills improve. This supports a policy implication that curriculum design and teacher development, not just device access, are critical.

Opposing or mixed findings emphasize two cautionary points. First, Junco (2012) and other studies highlight that high digital activity and communication use do not always translate into better academic outcomes; in some contexts, heavy social media use correlates negatively with academic engagement. This suggests that high scores in communication skills may partly reflect non-academic, leisure use that does not directly support learning. Second, several Nigerian and African studies report lower overall digital competence than the present study (e.g., Ojo & Adu; studies reporting limited ICT integration), indicating institutional variance: where universities have weaker ICT infrastructure or less pedagogical integration, even basic competencies can be low. That means the relatively high composite score reported here may reflect AAU students’ particular exposure (e.g., mobile internet access, lecturers’ adoption of LMS) and not be generalizable to all Nigerian universities.

Putting the findings and the literature together yields three practical interpretations:

1. Functional vs higher-order split: The data fit a widespread pattern: routine operational and communication skills are common because they are practiced daily (searching, messaging, typing, submitting assignments). However, media literacy and integrative problem-solving require explicit instruction, assessment, and scaffolded practice, a finding supported by

- Hatlevik (2015/2018) and Claro et al. (2018).
2. Role of pedagogy and assessment: Several studies (Claro et al., Scherer & Siddiq, Ng) show that teacher capacity, curriculum design, and performance-based tasks (rather than self-report) produce higher levels of advanced competencies. Thus, the observed moderate media/problem-solving scores likely indicate gaps in curriculum emphasis and teacher mediation.
 3. Access matters but is not sufficient: Nigerian studies (Agina-Obu; Afolabi et al.; Fakunle et al.) emphasize that while mobile and campus access explain gains in basic skills, equitable device/internet access plus deliberate training are required to translate those gains into academic problem-solving and critical evaluation competencies. Conversely, where access is low, even information literacy suffers (explaining opposing findings from some institutions).

The pattern observed, high information/communication skills, moderate media/problem-solving, strongly suggests that institutional responses should shift from merely improving access to intentionally designing curricula and assessments that require critical evaluation, multimodal composition, and problem-based digital tasks, and provide teacher professional development in the TIDE areas. The result supports the findings of Siddiq and Scherer (2019) and Chen (2025), who established that digital literacy predicts better learning outcomes.

Conclusion and Recommendations

The study concludes that digital literacy skills significantly influence undergraduate students' academic achievement in a Nigerian university context. Students who are proficient in information literacy, ICT use, and digital communication perform better academically. However, weaker competencies in media literacy and problem-solving suggest that students need support to develop critical and creative engagement with digital content. Access to personal digital devices further strengthens the positive impact of digital literacy, while gender and faculty differences are negligible.

To enhance student performance and digital readiness, universities should institutionalize digital literacy programs across all faculties, ensure reliable access to ICT infrastructure, and design interventions that promote creative and ethical digital engagement. Policymakers should integrate digital literacy benchmarks into national higher education quality assurance frameworks, while lecturers should embed digital projects, online research tasks, and critical evaluation exercises in coursework. Such initiatives will help bridge digital gaps, improve learning outcomes, and prepare undergraduates for participation in the global knowledge economy.

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