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**DIGITAL LITERACY SKILLS AND ACADEMIC PERFORMANCE OF
OFFICE TECHNOLOGY AND MANAGEMENT STUDENTS IN SELECTED
FEDERAL POLYTECHNICS IN NORTHEASTERN NIGERIA**

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Abstract

Digital literacy has become an essential part of modern education, particularly in technical and vocational programmes where students are expected to learn and perform in technology-supported environments. This study examined the relationship between digital literacy skills and academic performance among HND II Office Technology and Management (OTM) students in selected federal polytechnics in Northeastern Nigeria. The study adopted a descriptive survey research design, and a sample of 218 students was selected using proportionate stratified random sampling. Data were collected using a structured questionnaire and analyzed using descriptive statistics, Pearson Product Moment Correlation, and simple linear regression analysis. Findings revealed that the students possessed a high level of digital literacy skills, especially in internet usage, office application software, online communication, and digital document management. The study further established a moderate positive relationship ($r = 0.557$) between digital literacy skills and academic performance. Regression analysis showed that digital literacy skills significantly predicted academic performance, explaining approximately 31% of the variation ($R^2 = 0.31$) in students' academic outcomes. The study concludes that digital literacy plays a significant role in improving students' academic performance. It recommends strengthening ICT infrastructure, integrating practical digital literacy training into the curriculum, and promoting collaborative digital learning.

Keywords: *Digital Literacy, Technology, Management, Polytechnic, North, Nigeria*

Introduction

In recent years, digital technology has reshaped how students learn, communicate, and complete academic tasks. Today's higher education system increasingly depends on digital tools for teaching, learning, research, and academic collaboration. Students are increasingly required to use digital tools for academic tasks such as research, communication, and assignment completion (Chen, 2025; Yuan et al., 2025). As a result, digital literacy has become an essential academic competence in the 21st century.

Digital literacy refers to the ability to confidently and effectively use digital tools to access information, evaluate content, communicate, and produce academic work. These skills include internet navigation, information searching, online communication, document creation, and the use of software applications, all of which are essential for learning in a digital environment (Esher-Alkalai, 2004; Mohammed et al., 2025). These competencies enable students to participate effectively in modern digital learning environments.

In Office Technology and Management (OTM) education, digital literacy is particularly important because students are trained to use modern office technologies such as word processing software, spreadsheets, presentation tools, and electronic filing systems (Holm, 2024; Eshet-Alkalai, 2004; Chen, 2025). These skills are essential for both academic success and workplace readiness in a technology-driven economy.

However, despite the growing importance of digital skills, many students still face challenges such as limited access to ICT resources, inadequate digital training, and inadequate exposure to online learning activities, which may negatively affect their academic performance (Aremu & Adeyemi, 2021; Holm, 2024).

Although several studies have explored digital literacy among university students, there is still limited research focusing specifically on HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria. This study therefore seeks to fill this gap by examining how digital literacy skills relate to academic performance in this group of students.

Objectives of the Study

The main objective of this study is to examine the relationship between digital literacy skills and academic performance of HND II Office Technology and Management students in selected federal polytechnics in Northeastern Nigeria. Specifically, the study seeks to:

- i. Determine the level of digital literacy skills possessed by HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria.
- ii. Examine the relationship between digital literacy skills and academic performance of HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria.

Research Questions

To guide the study, the following research questions were raised:

- i. What is the level of digital literacy skills among HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria?
- ii. What is the relationship between digital literacy skills and academic performance of HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria?

Research Hypothesis

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

H₀₁: There is no significant relationship between digital literacy skills and academic performance of HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria.

Literature Review

Theoretical Framework

This study is anchored in Eshet-Alkalai's Digital Literacy Framework (2004) and the Technology Acceptance Model (TAM) developed by Davis (1989). These two theories provide a strong foundation for understanding how students acquire digital skills and how such skills influence their academic activities.

Eshet-Alkalai's framework explains digital literacy as a multi-dimensional concept that goes beyond basic computer operation. It emphasizes that digital literacy involves the ability to access, understand, evaluate, create, and communicate information in digital environments (Eshet-Alkalai, 2004). The framework identifies key dimensions such as: Information literacy, Photo-visual literacy, Reproduction literacy, Branching literacy, and Socio-emotional literacy. In the context of Office Technology and Management (OTM) students, these skills are highly relevant because students are expected to work with office applications, manage digital documents, search for academic resources online, and communicate effectively using digital platforms. Students who possess these competencies are more likely to perform academic tasks efficiently and adapt to modern technology-based learning environments.

The Technology Acceptance Model explains how individuals decide to use technology based on two major factors: Perceived usefulness and perceived ease of use (Davis, 1989). According to the model, students are more likely to adopt digital tools when they believe that such tools are helpful for their academic work and easy to operate. In OTM education, this means that students who perceive digital tools as useful and user-friendly are more likely to use them for assignments, engage in online learning activities, conduct research effectively, and improve their academic performance.

Concept of Digital Literacy Skills

Digital literacy refers to the ability to effectively use digital technologies to access, evaluate, create, and share information in a meaningful way. In an academic setting, digital literacy includes skills such as: Internet navigation and information searching, use of office software (Word, Excel, PowerPoint), online communication and collaboration, digital document creation and management, use of educational platforms and applications (Mohammed et al., 2025; Eshet-Alkalai, 2004).

Digital literacy has become essential for students in higher education due to increasing reliance on technology-based learning systems (Yanti Ikhsam et al., 2022). These students are expected to demonstrate competence in using word processing tools, electronic filing systems, spreadsheets for data management, and presentation tools for academic and professional tasks.

Digital literacy helps students to manage academic responsibilities more effectively and prepares them for workplace expectations in a technology-driven environment (Chen, 2025; Yuan et al., 2025).

Digital Literacy and Academic Performance

Academic performance refers to students' ability to achieve educational objectives, often reflected in assessments, assignments, and overall academic outcomes.

Digital literacy has increasingly been recognized as a key determinant of academic performance, especially in technology-driven learning environments. However, different studies present complementary but slightly varied perspectives on how this influence occurs.

For instance, Chen (2025) emphasizes that digital literacy improves academic achievement by enhancing students' ability to adapt to digital learning environments and regulate their learning processes. In contrast, Li et al. (2025), through a meta-analysis, provide broader evidence across multiple studies and conclude that the relationship between digital literacy and academic performance is consistent but operates through multiple learning mechanisms such as problem-solving ability and information processing.

Similarly, while Chen (2025) focuses more on individual adaptation to digital learning systems, Yuan et al. (2025) extend the argument by explaining that digital literacy improves academic outcomes through mediating factors such as digital self-efficacy and learning engagement. This suggests that digital literacy does not act in isolation but interacts with psychological and behavioral factors to influence performance.

In addition, Holm (2024) provides a more context-specific perspective by showing that digital literacy significantly enhances performance in online learning environments, particularly in courses requiring independent research and self-directed learning. This contrasts with broader findings from Li et al. (2025), who report that the effect of digital literacy remains significant across both online and blended learning environments.

Overall, while these studies differ in context and explanatory focus, they consistently agree that digital literacy positively influences academic performance, though the pathways of influence may vary.

Empirical Review

Empirical studies across different educational contexts consistently show that digital literacy is positively associated with academic performance, although variations exist in intensity and contributing factors.

For example, Mohamad et al. (2025) found that students in technical and vocational education programmes demonstrate improved academic outcomes when they possess stronger digital literacy skills. This aligns with the findings of Yanti Ikhsam et al. (2025), who reported that digital literacy not only improves academic achievement but also shapes students' learning styles in digital environments.

However, while Mohamad et al. (2025) focus mainly on performance outcomes, Yanti Ikhsam et al. (2025) extend the discussion by suggesting that digital literacy also influences how students learn, not just how well they perform academically. This indicates that digital literacy affects both cognitive outcomes and learning behavior.

Furthermore, Supratman Zakir et al. (2025) provide a more advanced explanation by identifying mediating variables such as self-efficacy, informal learning, and digital competence, which strengthen the relationship between digital literacy and academic performance. This expands earlier findings by Chen (2025) and Holm (2024), who primarily focus on direct effects rather than mediating pathways.

Across these studies, a common agreement emerges: students with higher digital literacy skills tend to perform better academically. However, differences lie in whether the effect is direct (Holm, 2024), mediated (Supratman Zakir et al., 2025; Yuan et al., 2025), or context-dependent (Mohamad et al., 2025).

This synthesis suggests that digital literacy should not be viewed as a standalone factor but as part of a broader ecosystem of learning skills, psychological readiness, and educational context.

Summary of Literature Review

The literature reviewed shows that digital literacy is a critical skill in modern education, especially for students in vocational and technical fields such as Office Technology and Management.

Theoretical perspectives from Eshet-Alkalai (2004) and Davis (1989) explain that digital literacy involves both skill acquisition and user acceptance of technology.

Empirical studies consistently indicate that students with stronger digital literacy skills tend to achieve better academic outcomes, although environmental and institutional factors also play a significant role.

However, most existing studies focus on general university populations, leaving a gap in research on HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria, which this study aims to address.

Methodology

This study adopted a descriptive survey research design to examine the relationship between digital literacy skills and academic performance among HND II Office Technology and Management students in selected federal polytechnics in Northeastern Nigeria. The design was considered appropriate because it allows the researcher to collect data from a defined population and describe existing conditions as they naturally occur without manipulating any variables. According to Creswell and Creswell (2018), survey research is useful when a study seeks to obtain information about attitudes, behaviors, or relationships among variables within a population. The population of this study consisted of 478 HND II Office Technology and Management students from five selected federal polytechnics in Northeastern Nigeria. The institutions include: Federal Polytechnic Bauchi, Federal Polytechnic Mubi, Federal Polytechnic Bali, Federal Polytechnic Damaturu, and Federal Polytechnic Monguno. HND II students were selected because they have already been exposed to core OTM courses and practical ICT-related activities, making them suitable respondents for assessing digital literacy and academic performance. A sample size of 218 students was determined using Yamane's (1967) sample size determination formula. A proportionate stratified random sampling technique was used to ensure fair representation from each institution based on their population size. This method was appropriate because the population was divided into distinct strata (the five polytechnics), allowing each institution to be fairly represented in the study. This also helped to reduce sampling bias and improve the generalizability of the findings. Data for this study were collected using a structured questionnaire titled: Digital Literacy Skills and Academic Performance Questionnaire (DLSPAQ). The questionnaire was divided into two sections: section A: Respondents' demographic information, and section B: Items measuring digital literacy skills and academic performance. The digital literacy section assessed skills such as: internet navigation, use of office applications, digital document management, online communication, and digital collaboration skills. The academic performance section measured students' self-reported ability to: complete assignments, conduct academic research, understand course content, and meet academic requirements effectively. Responses were measured using a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). The instrument was subjected to face and content validity by experts in Office Technology and Management and research methodology. Their observations and corrections were used to improve clarity of items, remove ambiguity, and ensure relevance to the research objectives. This process ensured that the instrument adequately measured what it was intended to measure. A pilot test was conducted in Federal Polytechnic, Offa, Kwara State to determine the reliability of the instrument. The internal consistency of the questionnaire was tested using Cronbach's Alpha, and a reliability coefficient of 0.84 was obtained. This indicates that the instrument has a high level of reliability and is suitable for data collection, as values above 0.70 are generally considered acceptable in social science research. The questionnaires were administered to respondents with the assistance of trained research assistants in the selected polytechnics. Before distribution, respondents were informed about the purpose of the study, assured of confidentiality,

and made aware that participation was voluntary. This helped to ensure that responses were honest, voluntary, and ethically obtained. Data collected were analyzed using both descriptive and inferential statistics. Specifically, mean and standard deviation were used to answer research questions; Pearson Product Moment Correlation was used to test the relationship between digital literacy skills and academic performance. The Pearson Product Moment Correlation coefficient was used in this study because it is appropriate for examining the strength and direction of the relationship between two continuous variables, namely digital literacy skills and academic performance. Since the study adopted a descriptive survey design and did not manipulate variables, Pearson correlation is suitable for determining the degree of association between the variables. This choice is supported by Creswell and Creswell (2018), who note that correlation analysis is appropriate in non-experimental studies where the focus is on relationships rather than causation. Simple linear regression analysis was used to determine the extent to which digital literacy predicts academic performance. All hypotheses were tested at a 0.05 level of significance. The study ensured ethical standards by obtaining voluntary participation from respondents, maintaining confidentiality of responses, and ensuring that no respondent was forced or coerced into participation

Results and Discussion

Table 1: Descriptive Statistics on the level of digital literacy skills among HND II OTM students in selected northeastern Nigerian federal polytechnics

S/N	Statement	N	Mean	Std. D.	Remark
1	I can effectively navigate online resources for learning	218	4.65	0.55	Agreed
2	I am proficient in using office software for assignments	218	4.72	0.51	Agreed
3	I can communicate effectively using online platforms	218	4.60	0.58	Agreed
4	I can process and manage documents digitally	218	4.50	0.62	Agreed
5	I can collaborate with classmates using digital tools	218	4.45	0.60	Agreed

Source: Field Survey, 2026

The results presented in Table 1 above show that HND II Office Technology and Management students in selected federal polytechnics in Northeastern Nigeria generally possess a high level of digital literacy skills. The mean scores ranged from 4.45 to 4.72, indicating a strong level of agreement among respondents. Students reported that they are particularly competent in: using office application software for assignments (Mean = 4.72), navigating online learning resources (Mean = 4.65), communicating through online platforms (Mean = 4.60), managing digital documents effectively (Mean = 4.50), and collaborating using digital tools (Mean = 4.45). This suggests that most students are already comfortable using digital tools for academic purposes. However, the slightly lower score in digital collaboration skills indicates that students may still need more exposure to group-based online learning activities and shared digital platforms. The findings imply that digital literacy skills among OTM students are well developed, especially in individual task performance.

Table 2: Descriptive Statistics on academic performance of HND II OTM students in selected federal polytechnics in northeastern Nigeria.

S/N	Statement	N	Mean	Std. D.	Remark
1	I complete my assignments on time	218	4.68	.52	Agreed
2	I submit quality assignments that meet lecturer expectations	218	4.60	.57	Agreed
3	I can conduct research effectively for my assignments	218	4.50	.60	Agreed
4	I perform well in overall course requirements	218	4.40	.63	Agreed

Source: Field Survey, 2026

The findings in Table 2 above indicate that respondents also reported a high level of academic performance, with mean scores ranging from 4.40 to 4.68. Students indicated that they are able to: complete assignments on time (Mean = 4.68), submit quality assignments that meet academic expectations (Mean = 4.60), conduct academic research effectively (Mean = 4.50), and perform well in overall course requirements (Mean = 4.40). This shows that students perceive themselves as academically active and capable of meeting their academic responsibilities. The results suggest that students' ability to use digital tools may be contributing positively to how they organize and complete academic tasks.

Table 3: Relationship between Digital Literacy Skills and Academic Performance of HND II OTM in Northeastern Nigerian Federal Polytechnics

Variable	Digital Literacy Skills	Academic Performance
Digital Literacy	1.000	0.557
Academic Performance	0.557	1.000

Source: Field Survey, 2026

The Pearson Product Moment Correlation analysis revealed a moderate positive relationship between digital literacy skills and academic performance ($r = 0.557$). This means that students who possess higher digital literacy skills tend to perform better academically. However, the relationship is not perfect, which implies that while digital literacy plays an important role, it is not the only factor influencing academic performance. Other factors such as teaching quality, learning environment, student motivation, and access to ICT facilities may also contribute to students' academic outcomes.

Table 4: Regression analysis on digital literacy and academic performance of HND II OTM students in federal polytechnics in northeastern Nigeria.

Predictor	B(Unstandardized)	Std. Error	Beta (Standardized)	t-value	p-value	R ²
Digital Literacy Skills	0.79	0.05	0.79	15.56	0.001	0.31

Source: Field Survey, 2026

The regression analysis in Table 4 above revealed that digital literacy skills significantly influenced academic performance among HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria ($\beta = 0.79$, $t = 15.56$, $p < 0.01$), explaining approximately 31% of the variance ($R^2 = 0.31$) in students' academic performance. This indicates a meaningful but not exclusive influence, suggesting that other factors also contribute to academic success. Since $p < 0.05$, H_{01} was rejected. This implies that a significant relationship exists between digital literacy skills and academic performance.

Note: Since both variables were measured using self-reported data, there is a possibility of common method bias, which may slightly inflate the strength of the relationship. Therefore, future studies are encouraged to use actual GPA records, exam scores, and lecturer assessments to strengthen validity.

Discussion of Findings

The findings of this study clearly show that HND II OTM students possess a high level of digital literacy skills, particularly in the use of office applications, online communication tools, and digital document management systems. This aligns with the expectations of modern vocational education, where students are required to interact frequently with digital tools in both academic and professional settings.

The study also revealed a moderate positive relationship between digital literacy and academic performance, suggesting that students who are more digitally skilled tend to perform better academically. This finding is consistent with Chen (2025), who reported that digital literacy improves students' ability to adapt to digital learning environments and enhances academic achievement. Similarly, Li et al. (2025) found that digital literacy contributes positively to academic success by improving students' ability to access information, solve academic problems, and engage in learning activities effectively. Furthermore, Yuan et al. (2025) emphasized that digital literacy improves academic outcomes by strengthening students' self-efficacy and engagement in digital learning environments.

The regression results further confirmed that digital literacy is a significant predictor of academic performance, meaning that students with better digital skills are more likely to achieve higher academic success. However, despite these positive findings, the study recognizes that academic performance is influenced by multiple factors beyond digital literacy. These include: quality of instruction, availability of ICT infrastructure, student motivation, and learning environment. Therefore, improving academic performance requires a holistic approach that goes beyond digital skills training alone.

Summary of Findings

This study examined the relationship between digital literacy skills and academic performance among HND II Office Technology and Management students in selected federal polytechnics in Northeastern Nigeria. The study found that students possess a relatively high level of digital literacy competence, particularly in the use of office applications, internet navigation, online communication, and digital document management. Students also reported a high level of academic performance, especially in assignment completion, quality submission, and academic research activities. There is a moderate positive relationship ($r = 0.557$) between digital literacy skills and academic performance. Digital literacy skills were found to be a significant predictor of academic performance, explaining a considerable proportion of variation in students' academic outcomes.

Conclusion

Based on the findings of this study, it is concluded that digital literacy skills play a significant positive role in enhancing the academic performance of HND II Office Technology and Management students in federal polytechnics in Northeastern Nigeria. Students who are more competent in using digital tools tend to perform better academically, as they are able to access learning materials more easily, complete assignments efficiently, and engage more effectively in academic activities. However, the study also recognizes that digital literacy alone does not determine academic success. Other factors such as teaching quality, availability of ICT infrastructure, learning environment, and student motivation also contribute significantly to academic performance. Therefore, strengthening students' digital literacy skills is essential not only for academic success but also for preparing them for modern workplace demands in a technology-driven economy.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Federal polytechnics should improve ICT infrastructure by providing adequate computers, stable internet access, and updated software to support students' learning activities.
2. Digital literacy training should be fully integrated into the Office Technology and Management curriculum, with emphasis on practical applications such as office software, digital communication, and document management.
3. Students should be encouraged to engage in collaborative digital learning activities, such as group projects, shared online documents, and virtual discussions, to strengthen teamwork skills.

4. Institutions should organize regular ICT workshops and seminars to expose students and lecturers to emerging digital tools and modern workplace technologies.
5. Future researchers should consider using objective academic data such as GPA or examination results, in addition to questionnaires, to improve the accuracy of findings.

Limitations of the Study

This study had some limitations that should be considered when interpreting the findings:

- i. The study relied on self-reported academic performance, which may be influenced by personal bias or overestimation.
- ii. The research was limited to HND II Office Technology and Management students in selected federal polytechnics in Northeastern Nigeria, which may limit generalization to other regions or programmes.
- iii. Only digital literacy skills were examined as a predictor of academic performance, while other important factors such as motivation, teaching quality, and socioeconomic background were not included.
- iv. The study used a cross-sectional design, meaning that data were collected at a single point in time; therefore, causality cannot be firmly established.

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