

INFLUENCE OF DIGITAL LITERACY SKILLS ON RESEARCH PRODUCTIVITY OF LIBRARIANS IN PUBLIC UNIVERSITIES IN SOUTH-WEST, NIGERIA

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Abstract

Librarians, as an integral part of academia, are expected to conduct research to advance both their careers and their profession. However, this is not always possible due to certain factors. While researchers have examined various determinants of research productivity among librarians, scant attention has been paid to the issue of digital literacy skills, particularly in the context of public universities in South-West, Nigeria. Consequently, this study investigates digital literacy skills and research productivity of librarians in public universities in the South-West, Nigeria. Two hundred and two (202) librarians in public university libraries in the South-West, Nigeria. The survey research method was adopted with a total enumeration of the sample. Data analysis was conducted using descriptive and inferential statistics. The results showed a high level of research productivity (Mean = 3.31) and high digital literacy skills among the respondents (Mean = 3.51). In addition, the test of the hypothesis revealed that digital literacy skills have a significant but moderate

influence ($R^2 = 215$; $p < 0.05$) on research productivity. The study concluded that librarians in South-west Nigeria are well-positioned to meet contemporary scholarly demands, especially if they are supported through targeted interventions to close identified skill gaps. It was therefore recommended that University management should sustain and expand existing research-support structures, such as access to scholarly databases, research grants, and conference sponsorships, to maintain and further enhance this high level of productivity.

Keywords: Academic libraries, Digital literacy skills, Information needs, Research Productivity.

Introduction

Academic librarians are widely recognised as integral members of the university academic community and are therefore expected to perform the core functions traditionally associated with academic staff. These services are teaching, research, and community service. Among these responsibilities, research productivity has attracted considerable attention within global academia because it contributes to knowledge advancement, enhances institutional visibility, and serves as a key criterion for promotion and career progression for academics. Research productivity is typically assessed using bibliometric indicators such as the number of publications produced over time, citation counts, and impact metrics including the h-index and i10-index, which collectively reflect the visibility and influence of scholarly output (Ademola & Omotayo, 2022; Ryazanova & Jaškiene, 2022; Iwu-James et al., 2023). This comprehensive approach to measuring research

productivity is aimed at ensuring that, not only are scholars producing research, but they are having impact and encouraging further research that amplify the effects of their research

However, despite the importance of research productivity for both individual academics and the institutions they serve, several studies have reported relatively low research output among librarians in Nigerian universities. Low research productivity has been attributed to multiple institutional and professional constraints, such as heavy workloads, limited access to research funding, inadequate mentoring opportunities, and the high cost of scholarly publication (Shonhe, 2020; Adetomiwa et al., 2023; Ubogu, 2024). Nevertheless, Adetayo et al (2022) reported that some Nigerian librarians remain highly productive despite these constraints. This suggests that individual-level competencies may also play a significant role in shaping research outcomes.

One individual-level competency that may determine research output is digital literacy. As scholarly communication increasingly relies on digital technologies such as online scholarly databases, institutional repositories, reference management software, data analysis tools, and emerging artificial intelligence–assisted research platforms, digital literacy skills have become critical for effective literature searching, data management, collaboration, and dissemination of research findings. Empirical studies in Nigeria indicate that digital and ICT competencies significantly

influence librarians' research productivity and related professional performance outcomes (Adetomiwa et al., 2023; Iwu-James et al., 2023). However, existing studies have largely examined digital skills in a fragmented manner and have rarely applied comprehensive frameworks for assessing digital literacy competencies. This study, therefore, examines the relationship between digital literacy skills and research productivity among academic librarians using the Virginia Tech Digital Literacy Framework (Feerrar, 2019), with the aim of providing a more holistic understanding of how digital competencies influence scholarly output in Nigerian university libraries.

Statement of the Problem

Librarians, as an integral part of academia, are expected to conduct research to advance both their careers and their profession. However, some librarians, particularly in South-west Nigeria, are not producing the expected quantity and quality of research. This situation, where librarians' research productivity consistently fails to meet global standards, should be a matter of concern as it may lead to obsolete services, inability to help academic institutions achieve their aim of helping their societies grow, and ultimately, lack of recognition and promotion for librarians. Consequently, several studies have been conducted to evaluate the research productivity of librarians and factors that may affect it.

However, while researchers have examined various determinants of research productivity among librarians, such as institutional support, collaboration opportunities, and facilitating conditions, among others, little attention has been paid to the issue of digital literacy. The few studies that have explored these variables have done so in isolation. It is against this backdrop that the study will investigate digital literacy skills and research productivity of librarians in public universities in South-west Nigeria.

Hypothesis

The study is guided by this null hypothesis, which was tested at a 0.05 level of significance:

H₀₁ There is no significant influence of digital literacy skills on the research productivity of librarians in public universities, South-west, Nigeria.

Literature Review

Research Productivity among Librarians

Research is one of the three functions expected of academics, the other two being teaching and community service. There are, therefore, various studies that have examined research productivity in academia, including among librarians. A scholar observed that 80% of academic librarians in Nigerian institutions had faculty status, and as faculty members, they are anticipated to validate their standing by adding to the university's research output (Heng et al., 2020). There are three prominent indices for

measuring research production in the literature. They are quantity, impact, and reputation (Iwu-James et al., 2023). The metrics are often used individually or in combinations.

The most adopted approach to measuring research productivity focuses on the quantity of research output. This index focuses primarily on the quantitative aspect of research. In this perspective, assessors count the number of research works, such as technical reports, patents, books, chapters in books, or conference presentations produced by a scholar or institution over a given period (Adetayo et al., 2022). In essence, research productivity may be assessed by tallying the total of research outputs, including journal articles, conference papers, edited works, patents, books, and book chapters, generated within a certain time period.

Counting the number of completed studies allows for straightforward comparison across researchers, departments, or institutions. It provides a measurable and ostensibly objective basis for performance appraisal, promotion, and funding allocation. In regions such as Sub-Saharan Africa, where institutional efforts are focused on strengthening research culture and output, such metrics may catalyse increased research engagement. Furthermore, organizations and funding bodies often rely on quantitative indicators for monitoring compliance with research mandates, making the number of completed studies a convenient tool for accountability and policy implementation (Halaweh, 2021; Iwu-James et al., 2023). However, measuring

research productivity by the number of completed research projects is a widely utilized but increasingly scrutinized approach in academic evaluation.

The use of the number of completed research projects as a proxy for research productivity presents significant limitations. Primarily, it fails to account for the quality, originality, and societal impact of the research conducted. This view was echoed by Wu (2025), who also argued that a high volume of completed studies does not necessarily translate into meaningful contributions to the body of knowledge or to policy and practice. This limitation is particularly salient in the context of African universities, where the pressure to meet output targets may encourage quantity over quality. In some instances, researchers may be incentivized to pursue short-term, narrowly focused studies that are quicker to complete and publish, rather than engaging in complex, longitudinal, or interdisciplinary research that could have broader implications but require more time and resources.

Finally, the reliance on this metric can be especially disadvantageous in resource-constrained environments. In many African institutions, challenges such as limited access to research funding, inadequate infrastructure, and restricted publication opportunities hinder the ability of scholars to produce multiple completed studies within a short period (Ladipo et al.,2022). Consequently, a sole emphasis on numerical output risks marginalizing high-potential researchers operating under systemic constraints and may perpetuate inequities within the academic landscape.

In this regard, research productivity is therefore defined as the number of publications per researcher, the quantification of the cumulative impact, relevance, efficiency, and throughput of a researcher's scientific work as validly and reliably measured with the h-index. ⁵posited that: Research h-index is a metric that uses a single number to best measure a scientist's professional productivity as depicted by how many of the scientist's **k** publications have been cited up to **k** times by international publications of other scientists. The h-index is the best numerical representation of the impact and productivity of a researcher/scientist, strictly based on the researcher's publications and patents, rather than the impact factor of the journals in which the papers were published (Zhao et al., 2021). This approach was prompted by the need to comply with the assessment criteria of regulatory bodies and academic regulatory agencies .

University ranking organizations, for instance, employ diverse metrics and criteria to determine university standings, including research output and citations, academic reputation, educational quality, teaching environment and satisfaction, student-to-staff ratio, proportion of international information users and faculty, industry collaboration, and accolades such as Nobel Prizes and Fields Medals. Nevertheless, these bodies have not specifically concentrated on assessing the research output of institutions (QS Universities Rankings, 2025). Moreover, the aforementioned rating organizations, including Quacquarelli Symonds (QS) and

many publications, face criticism for their significant bias, as they depend on opinion polls. The primary objective of these rankings is generally associated with assisting information users in selecting a university, rather than evaluating research quality.

Digital Literacy Skills of Librarians

The world is firmly in a digital era where every aspect of human life is affected by digital technology. It has been pointed out that, to effectively participate in the current world, including politics, trade, education, and social interaction, individuals must have a certain level of digital skills (Zhang et al., 2025). The higher the level of digital skills, the more competent one becomes in participating in modern society. Digital literacy encompasses the competencies required to effectively navigate, evaluate, and create information using digital technologies. For researchers, especially if they are librarians, digital literacy skills are non-negotiable. However, the challenge is identifying digital literacy. As technology continues to evolve, so does the range of skills people need to acquire to be considered digitally literate. Indeed, scholars have conceded that not everyone will attain the highest level of proficiency in digital skills. Consequently, digital literacy skills frameworks have adopted categories such as novice, beginner, expert, and professional, among other rankings (Cabero-Almenara et al., 2020). These rankings recognise the fact that skills and aptitude for digital skills among scholars are not even while also helping scholars determine the level they are and which level they should aspire to in order to be more effective

Digital literacy itself is a multifaceted construct that includes technical proficiency, critical thinking, and ethical understanding, enabling individuals to participate fully in digital societies (Martínez-Bravo et al., 2022). Digital literacy skills include the capacity to access, manage, grasp, integrate, communicate, analyse, and produce information using digital technology securely and acceptably. Possessing digital literacy abilities is crucial for using the diverse opportunities offered by ICT and for contributing effectively and creatively. The importance of digital literacy skills for information users was emphasized, specifically referring to the ability to proficiently utilize various software programs and digital tools. Scholars such as Nguyen et al (2021) have identified various application areas for digital skills in education. These include using learning management systems to efficiently attain academic and personal objectives; managing and providing support and solutions through information and communication technology devices.

Digital Literacy Skills and Research Productivity among Librarians

In the current swiftly changing information environment, librarians are essential in assisting individuals and communities in accessing, assessing, and employing digital resources efficiently. As technology persistently transforms information access and distribution, library workers must adopt digital literacy as an essential skill. This study examines the significance of digital literacy in developing technology and how library professionals might utilise it to attain self-

sufficiency in their positions. The researcher finds that digital literacy enables library personnel to adeptly navigate the digital terrain, leverage AI and data analytics, curate digital resources efficiently, instruct on online information assessment, and advocate for digital inclusion.

In the continuously changing digital information environment, librarians are responsible for facilitating access to knowledge and assisting users in navigating a vast array of digital resources. Diseiye et al. (2024) posit that harnessing digital literacy is essential for attaining self-sufficiency in these positions. Librarians, as information navigators in the digital world, must consistently enhance their digital literacy abilities and adapt to new technology. The authors, therefore, advocate for librarians to engage in ongoing training and professional development in digital marketing, e-commerce, and content creation. It suggests that libraries should strategically allocate resources to acquire essential digital tools and platforms for revenue generation, and recommends the implementation of change management strategies to mitigate resistance to digital transformation and cultivate a culture of innovation.

The correlation between information literacy abilities and the research output of academic personnel has recently been a topic at the heart of academic discussion. Academics encounter a plethora of information options in their pursuit of knowledge due to the complexity of information sources and formats. This presents

additional issues for academic professionals in evaluating and comprehending the information. The ambiguous quality and escalating volume of information provide significant challenges for any civilization.

Literature clearly indicates that information literacy significantly enhances the research output of academics. For instance, study on the influence of web-based information literacy skills on research output among academics at Nigerian Federal Universities revealed that possessing web-based information literacy abilities has significantly enhanced research output among academic staff in federal institutions in the country (Anekwe & Uzoamaka, 2018). Similarly, Madu et al. (2017) examined the correlation between Web 2.0 technological capabilities and the academic output of staff at Nigerian institutions located in the North Central political zone of Nigeria. The findings indicate a significant correlation between Web 2.0 technology/information literacy abilities and the productivity of academic personnel. The calculated t-value of 17.028 indicates a positive and robust connection, demonstrating that the development of Web 2.0 technological skills enhances academic output, including research activities.

Librarians also require digital literacy to effectively discharge their professional duties. This submission was confirmed in a study by Akwang and Udoh (2024) in which the scholars examined the relationship between librarians' digital literacy and their use of electronic information resources for research activities in

university libraries. The research employed a correlational design, with a sample of eighty-four (84) librarians from public university libraries in South-East Nigeria. This research conducted a comprehensive population survey. Two sets of researcher-administered questionnaires utilising a 4-point rating scale for both the independent and associated dependent variables were employed to gather data for the study. The acquired data were examined via Pearson's Product-Moment Correlation Coefficient (PPMCC) to address the study issues, while Simple Regression Statistics were employed to evaluate the null hypotheses at a 0.05 level of significance. The study demonstrated that librarians' online search skills exhibited a robust positive correlation with the utilisation of electronic information resources for research activities in public university libraries in South-East Nigeria, whereas Web 2.0 and librarians' online collaboration skills displayed a tenuous relationship.

Akwang and Udoh (2024). examined the correlations between digital literacy competencies and work effectiveness among academic librarians at institutions throughout South-East Nigeria. The research encompasses a cohort of 153 academic librarians from federal universities. It utilised a correlational study design. The findings indicate that augmenting librarians' competencies in these domains correlates with enhanced work effectiveness. The research advocated for collaborations with ICT stakeholders, the implementation of extensive training

programmes, and the establishment of ongoing professional development efforts to enhance librarians' digital literacy and work satisfaction. The finding is relevant to the current study because the effectiveness of librarians can also expand to their research ability.

Another study which focused on librarians in South-South universities in Nigeria also revealed that librarians in this region, just as it was found in the South-East, possess basic digital literacy skills, particularly in the aspect of information literacy. The study by Nkemdilim and Ekoko (2023) investigated the role of information literacy skills as a possible predictor of research output among librarians at investigation utilised a descriptive survey research framework. The study's population consisted of 217 librarians from the university libraries of the 16 public universities located in South-South, Nigeria. The study found that university librarians exhibited advanced information literacy skills. This included the ability to verify reputable authors and assess the credibility of various information sources, the capability to accurately cite all materials consulted during research, and proficiency in creating bibliographies and references from the retrieved materials. The highest publication output was observed for journal articles, whereas other formats like technical reports and textbooks showed lower levels of output. The correlation between information literacy skills and research output among university librarians in South-South, Nigeria, is significant. The study, therefore,

recommended that librarians utilize any strategies that can enhance their information literacy skills.

Studies from North-East Nigeria also show a similar pattern with evidence indicating that Nigerian librarians mainly have information literacy skills. A study by Babalola and Bakum (2022) explored how information literacy skills impact the research productivity of librarians in public universities located in North-East Nigeria. The investigation utilized a survey research design. The study's population consisted of 361 librarians from public universities located in the North East, Nigeria. The findings indicated that information literacy skills ($R^2 = 0.056$, $F(1,163) = 9.698$, $p < 0.05$) positively and significantly influenced the research productivity of librarians in public universities located in North-East, Nigeria. The findings indicate that the research productivity of librarians in public universities in North-East, Nigeria, was notably low (mean = 1.93), whereas the level of information literacy skills was high. The findings indicated that information literacy skills played a significant role in enhancing the research productivity of librarians at public universities in the North-East.

The link between information literacy and research productivity was also highlighted in a related study by Wagwu et al. (2024) which explored the role of information literacy on the research output of librarians in Nigerian university libraries. The investigation was directed by four specific objectives and utilized a

descriptive survey design. The findings indicate a significant level of scholarly output among librarians, highlighting an enhancement in both the quality and quantity of publications produced by library professionals. The findings further validate the acknowledgment of information literacy competencies among librarians, acquired through participation in conferences, seminars, collaborative support, and guidance from library personnel. The findings notably emphasize the beneficial effect of information literacy skills on the research productivity of librarians. Nonetheless, the investigation also highlights obstacles encountered by librarians in obtaining these competencies, such as a lack of awareness among library patrons, restricted time for skill enhancement, the unavailability of dedicated instructional areas, and insufficient backing from library administration.

In South West Nigeria, researchers also focused on information literacy instead of the broader digital literacy skills. Afolabi and Oladokun (2020) examined the issue from the angle of librarians in private universities. The study assessed the correlations among information availability, information literacy abilities, and research output among researchers at Lead City University, Ibadan. The quantitative research approach was employed using a self-developed questionnaire as the data gathering instrument. The study sample, including 71 academic staff members, was recruited using a proportional sampling method from four university faculties. Findings indicated a substantial correlation among information availability,

information literacy abilities, and research productivity. The research advised the library to enhance knowledge of available resources and provide training in information search and retrieval to increase users' information literacy abilities.

Methodology

The survey research method was adopted for the study. The population of the study includes 202 librarians in public university libraries in South West Nigeria. In view of the population size and to guide against non-response, total enumeration was adopted, meaning that the sample includes all 202 librarians. The research instrument was a structured questionnaire. Data analysis was conducted using descriptive and inferential statistics.

Results and Discussion

Demographic Data Analysis

The result of the demographic characteristics of the respondents in the study is shown in Table 4.1

Table 4.1: Demographic Distribution of the Respondents.

Gender	Frequency	Percent
Female	96	50.8
Male	93	49.2
Total	189	100.
		0
Age		
21 -25	2	1.1
26 – 30	9	4.8
31 – 35	10	5.3

36 – 40	14	7.4
41 – 45	45	23.8
46 and above	109	57.7
Total	189	100.
		0
Work Experience		
0-5	38	20.1
6-10	26	13.8
11-15	62	32.8
16-20	46	24.3
20 – 25	4	2.1
21-25	9	4.8
26+	4	2.1
Total	189	100.
		0
Academic Qualification		
Bachelors	10	5.3
Masters	105	55.6
M.Phil/M.Phil PhD	15	7.9
PhD	59	31.2
Total	189	100.
		0
Job Status		
Librarian II	30	15.9
Librarian I	29	15.3
Senior Librarian	52	27.5
Principal Librarian	49	25.9
Deputy University Librarian	22	11.6
University Librarian	7	3.7
Total	189	100.
		0
Section		
Cataloguing and Classification Unit	42	22.2
Acquisition Unit	27	14.3
Circulation Unit	39	20.6
Reference Unit	31	16.4
Virtual-Library Unit	9	4.8
Reprographic/Conservation/ Preservation Unit	4	2.1
Serial Unit	37	19.6
Total	189	100.

Source: Fieldwork, 2025

The demographic characteristics of the 189 respondents indicate a relatively balanced and experienced sample. The sample has a nearly equal gender representation (Female =50.8%; Males =49.2%), In terms of professional experience, the respondents are mostly experienced with around 57% having between 11–20 years of work. However, there is adequate fresh insight as 20.1% of the respondents have 0–5 experience. Agewise, majority of the respondents (81.5%) are aged 40 years and above with relatively few younger respondents. the respondents are also well educated with 55.6% holding a Master’s degree and 31.2% a PhD. Furthermore, majority of the respondents are mid-to-top level management with only about 31% being entry level professionals. Finally, the sectional distribution shows that all section of a standard academic library are represented. Overall, demographic data such as gender, age, education, and professional experience help researchers contextualize findings and understand patterns within the study population.

Table 2: Influence Of Digital Literacy Skills and Research Productivity of Librarians in Public Universities, South-west, Nigeria.

Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
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1	643 ^a	.413	.410	.41669
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a. Predictors: (Constant), Digital Literacy Skill

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	22.870	1	22.870	131.717	.000 ^b
Residual	32.469	187	.174		
Total	55.340	188			

a. Dependent Variable: Research Productivity

b. Predictors: (Constant), Digital Literacy Skill

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.064	.290		.220	.826
Digital Literacy Skill	.932	.081	.643	11.477	.000

a. Dependent Variable: Research productivity

Table 4.6 presents a regression analysis examining the influence of digital literacy skills on librarians' research productivity in public universities in South-

West Nigeria. The model shows a strong positive relationship ($R = 0.643$), with digital literacy explaining 41.3% of the variation in research productivity ($R^2 = 0.413$), while 58.7% is due to other factors. The adjusted R^2 (0.410) confirms the model's stability, and the standard error (0.41669) indicates a good fit between predicted and observed values.

The ANOVA results indicate that the model is statistically significant ($F = 131.717$, $p = 0.000 < 0.05$), confirming that digital literacy significantly influences research productivity and leading to the rejection of the null hypothesis.

The coefficient for digital literacy ($B = 0.932$) shows that a one-unit increase in digital literacy leads to a 0.932 increase in research productivity, holding other factors constant. This effect is highly significant ($t = 11.477$, $p = 0.000$). The constant (0.064) is not significant ($p = 0.826$), indicating negligible baseline productivity without digital literacy. Regression coefficients generally indicate how much the dependent variable changes with a unit increase in the predictor .

Overall, digital literacy is a strong and significant predictor of research productivity. This aligns with Ideh and Ogbomo (2025), who found a positive but non-significant relationship in South-South Nigeria due to low skill and output levels. In contrast, the current study shows a stronger and significant effect,

suggesting higher digital literacy or better institutional support in South-West Nigeria.

Supporting evidence shows that digital skills such as emailing, database searching, and ICT use enhance librarians' job performance (Edewor & Agbro, 2024), which translates to improved research productivity. Similarly, Friday et al. (2024) found a positive but non-significant effect due to low baseline levels, while Akpojotor (2024) reported that effective use of digital databases improves productivity despite infrastructural constraints. Afolabi and Oladokun (2020) also found that information literacy skills significantly enhance research productivity among academic staff.

Recommendations

Based on the findings, the following recommendations are proposed:

1. University management should sustain and expand existing research-support structures, such as access to scholarly databases, research grants, and conference sponsorships, to maintain and further enhance this high level of productivity.
2. Although it was found that the participant possesses strong digital literacy skills, it is important to sustain and improve this through targeted workshops to build capacity in digital communication etiquette,

collaborative writing tools, and effective online feedback mechanisms to improve virtual teamwork.

3. In line with the importance of digital literacy skills to research productivity, library administrators should prioritise continuous digital literacy enhancement, especially in emerging technologies, data analysis tools, and scholarly publishing platforms, to maximise research output.

Conclusion

This study suggests that librarians in public universities in South-West Nigeria exhibit a high level of research productivity, underpinned by strong digital literacy skills and generally positive information behaviour. Their strengths lie in evaluating the credibility of information, adapting search strategies, identifying digital information needs, and leveraging digital tools for professional growth. However, certain skill gaps remain, particularly in drawing on past experiences, collecting highly targeted information, engaging in professional communication in digital environments, and providing feedback in online collaborations.

This underscores the central role of digital competence in enabling librarians to produce impactful research in an increasingly technology-driven academic environment. While positive information behaviour also contributes meaningfully, its moderate predictive strength suggests that enhancing reflective and

precision-oriented practices could further boost productivity. In conclusion, it can be said that librarians in South-west Nigeria are well-positioned to meet contemporary scholarly demands, especially if they are supported through targeted interventions to close identified skill gaps.

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