

## Digital Search Competence and Online Information Retrieval in Teacher Education: Evidence from Nigerian Colleges of Education

Faith Gameli Ametefe<sup>1\*</sup>, Ngozi Ibelegbu<sup>2</sup>, Alice Adamu Abalis<sup>3</sup>, James Godspower<sup>4</sup>,  
Dawuda Solomon Sendere<sup>5</sup>, Stephen Emmanuel<sup>6</sup>

<sup>1,3,4,5,6</sup>*Business Education Department, Faculty of Vocation and Technical Education, College of Education, Zing, Taraba State, Nigeria*

<sup>1,2</sup>*Department of Vocational and Technology Education, Faculty of Education, Taraba State University, Jalingo, Taraba State, Nigeria*

*Authors' Email Address: <sup>1</sup>faithamet3@gmail.com, <sup>2</sup>rassistant@gmail.com,  
<sup>3</sup>aliceabalis71@gmail.com, <sup>4</sup>jamesgodspower0002@gmail.com, <sup>5</sup>dwdsolomon@gmail.com  
<sup>6</sup>emmanuelstephen6177@gmail.com*

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\*Corresponding Author

### ABSTRACT

*In today's digital academic environment, the ability to locate, evaluate, and apply online information effectively has become a fundamental skill for educators. However, in many developing regions, particularly in Nigeria's northeastern states, the digital divide continues to restrict educators' engagement with online academic resources. This study examined the search skills of business educators in colleges of education across Adamawa and Taraba States. It focused on their proficiency in retrieving online information resources, the availability and utilization of digital tools, and the barriers that impede effective access. A descriptive survey design was adopted, and data were collected from accounting, marketing, and management lecturers using a structured questionnaire validated through expert review and pilot testing. The data were analyzed using descriptive and inferential statistics to identify disciplinary variations and explore the relationship between search skills and effective retrieval. Findings revealed that business educators possess basic digital literacy but have limited competence in advanced search techniques such as Boolean operations, database filtering, and citation tracking. Inadequate internet connectivity, high data costs, and the absence of institutional subscriptions to scholarly databases were identified as major constraints. The study found a significant positive relationship between educators' search skills and their ability to retrieve credible online information resources. The study concludes that strengthening search literacy through continuous professional development, improved institutional access to databases, and targeted digital training programs is vital for enhancing teaching and research quality in business education. This work contributes to the broader discourse on information retrieval competence within low-infrastructure academic environments and offers actionable insights for policymakers, educational administrators, and library professionals in Nigeria and other similar contexts.*

**Keywords:** *digital literacy, information behavior, educational technology, professional competence, higher education in Nigeria*

## INTRODUCTION

In contemporary academia, access to information is not merely a privilege but a necessary condition for scholarly productivity, innovation, and professional growth (Santos, 2025). The rapid expansion of digital technologies and internet-based resources has transformed how educators' access, retrieve, and use information (Alenezi et al., 2023). In this digital age, information retrieval skills form the foundation of effective teaching and research. The ability to conduct efficient research, evaluate the credibility of sources, and apply relevant information to pedagogical and scholarly activities defines academic competence in the twenty-first century (Silber-Varod et al., 2019). Despite the global movement toward digitization, inequalities persist between regions, institutions, and individuals in their capacity to harness the full potential of online information systems (Imran, 2023). This divide is particularly visible in the educational zones of Nigeria, where infrastructural and skill-related barriers hinder the realization of digital inclusion in higher education (Suleiman et al., 2024). Business educators, including lecturers in accounting, marketing, and management, occupy a strategic position within Nigeria's teacher education system. Their roles extend beyond classroom instruction to curriculum design, mentorship, and applied research that connects theoretical knowledge to real business practice (John Ogwuche, 2024). For these educators, the ability to access timely and credible online information is indispensable.

Digital resources such as open access journals, market analyses, policy briefs, and statistical datasets are essential for maintaining current curricula and promoting evidence-based instruction (Luo et al., 2020). However, recent studies indicate that many educators in Nigerian tertiary institutions continue to struggle with effective online information retrieval (Olaniyi, 2022), (Bankole et al., 2024). Their dependence on basic keyword searches or general web browsers often results in outdated or unreliable materials, limiting their capacity to deliver relevant data-driven business education (Qu, 2021). The importance of search skills extends beyond convenience. It determines educators' academic independence, their capacity for innovation, and the quality of student learning outcomes. Weak search competencies can compromise research credibility and reinforce reliance on low-quality materials (Habiba & Islam, 2022). This limitation is especially harmful in business education, where constant technological changes, policy shifts, and market fluctuations require continuous curricular renewal. Without the ability to search systematically, filter effectively, and evaluate digital sources critically, educators risk transmitting obsolete knowledge and disconnecting academic training from the realities of the modern business world (Chukwumeka & Garba, 2024).

The northeastern region of Nigeria, where Adamawa and Taraba States are located, provides a critical setting for examining this challenge. The region faces multiple barriers that affect both access to information and digital skill development. Frequent power outages, low broadband coverage, and financial constraints contribute to what calls a persistent state of digital deprivation among Nigerian academics (Ademola-Popoola & Adesina, 2025). Reports show that only about twenty-eight percent of tertiary institutions in this region maintain stable internet connections (Akmad, 2024). Even when educators possess basic search literacy, infrastructural deficiencies limit their ability to utilize digital databases effectively (Rafi et al., 2019). High data costs and a lack of institutional subscriptions to platforms such as JSTOR, ScienceDirect, and ERIC further aggravate the problem, forcing educators to depend on open access repositories and general search engines with limited scholarly depth (Bashir et al., 2022).

The implications of these challenges are profound. In teaching, inadequate search skills and restricted access to quality resources weaken lesson preparation, reduce classroom engagement, and hinder the integration of current business case studies into instruction (Nyoman et al., 2025). In research, the inability to retrieve and synthesize peer-reviewed literature reduces scholarly output and affects both personal academic growth and institutional reputation (Nicholls et al., 2022). Ultimately, the gap in search skill proficiency reinforces the broader pattern of digital inequality among Nigeria's regions, sustaining structural disparities in educational outcomes and workforce readiness. Globally, the

relationship between digital literacy, information retrieval, and professional competence is well established (Subaveerapandiyani et al., 2024). Studies from Europe and Asia have shown that educators who receive continuous training in online search strategies achieve higher levels of teaching effectiveness and research productivity (Chapman et al., 2005; Redecker, n.d.). In contrast, educators without formal search training often experience information anxiety, a state of cognitive overload and uncertainty when confronted with vast quantities of online data (Bawden & Robinson, 2020). In developing contexts, this anxiety is intensified by inadequate infrastructure, making search optimization both a pedagogical and psychological challenge. For business educators whose teaching depends on dynamic business and policy environments, limited search competence directly affects their ability to prepare students for the data-driven global economy (Fodor et al., 2021).

Several institutional and systemic factors contribute to the persistence of weak search skills among Nigerian educators (Tijani & Adeduyigbe, 2025). Many colleges of education lack structured digital literacy programs designed for academic research. Others provide limited ICT support for professional development. Where workshops exist, they often focus on basic computer use rather than advanced information retrieval. Consequently, many educators remain unfamiliar with key tools such as Boolean operators, citation chaining, and field-specific database filtering (Heck et al., 2024). They struggle to distinguish between credible academic sources and misleading web content, especially in an era marked by the proliferation of predatory journals (Callaghan & Nicholson, 2020). These deficiencies reduce research credibility and weaken institutional efforts to meet national and international standards for teacher education. Given these realities, this study examined the search skills of business educators in colleges of education in Adamawa and Taraba States (Ibrahim et al., 2025). It explored their proficiency levels, access to online information resources, utilization patterns, and the challenges encountered in the retrieval process. The study also investigated the relationship between educators' search competencies and their ability to retrieve relevant online information for teaching and research (Peciuliauskiene et al., 2022). It is grounded in the assumption that effective search skills are a critical determinant of professional competence in digital education. By assessing existing skills and identifying gaps, the study aims to provide evidence-based strategies for improving information retrieval practices among educators in resource-limited environments. The significance of this study is multidimensional. For educators, it offers a framework for understanding the competencies required to engage effectively with online information systems (Chi et al., 2020). For policymakers and administrators, it identifies infrastructural and capacity-building priorities for achieving digital inclusion in tertiary education (Wang & Si, 2024). For information scientists and librarians, it contributes empirical insights into the behavioral dimensions of information retrieval, enriching ongoing discussions on search literacy in developing countries (Onyancha, 2025). By situating the issue within the overlapping domains of digital literacy, information retrieval, and teacher education, the study bridges an important gap in scholarship that links information behavior with pedagogical effectiveness in a rapidly evolving educational environment.

Ultimately, improving educators' search skills is not a technical adjustment but a strategic investment in educational quality, research innovation, and national development. By focusing on business educators in Adamawa and Taraba States, this study provides context-specific evidence that informs global conversation on digital literacy and information retrieval in higher education. It also offers insights relevant to other developing regions facing similar challenges of access, infrastructure, and skill development.

## **METHODOLOGY**

### **Research Design**

This study adopted a descriptive survey design as that of Zheng et al., (2020) to assess the search skills and information retrieval competence of business educators in colleges of education across Adamawa and Taraba States, Nigeria. The design was chosen for its suitability in examining existing

conditions, identifying relationships among variables, and generating empirical data that reflect participants' actual experiences. It enabled a quantitative assessment of educators' search proficiency, access to online information resources, and the challenges influencing retrieval practices. Descriptive survey designs are widely used in library and information science research, particularly in studies that explore digital literacy, search behavior, and information access among educators and researchers (Borgman et al., 2005; Mansour, 2017)

### **Population and Sampling**

The study population comprised all business educators teaching accounting, marketing, and management in accredited colleges of education within Adamawa and Taraba States. During the 2023–2024 academic session, these states collectively housed six accredited colleges of education; four in Adamawa and two in Taraba, employing approximately 146 business educators. Because of the manageable population size, the study adopted a census sampling technique that included all available educators. This approach minimized sampling error and ensured comprehensive representation across departments, gender, and institutional categories (federal, state, and private). Of the 146 questionnaires distributed, 132 valid responses were retrieved, representing a 90.4 percent response rate. This rate was considered adequate for quantitative generalization (Sykes et al., 2018; Ward Creswell, 2018). Institutional cooperation and consistent follow-up visits to the business education departments contributed to the high return rate.

### **Instrument for Data Collection**

A structured questionnaire titled Search Skills and Information Retrieval Competence Questionnaire (SSIRCQ) was developed based on established models of information literacy assessment and digital search behavior (Eisenberg, 2008; UNESCO, 2021). The instrument contained five sections corresponding to the specific objectives of the study:

- a) current level of search skills,
- b) availability of online information resources,
- c) digital resource utilization patterns,
- d) challenges encountered in retrieval, and
- e) strategies for improving search skills.

Items were measured using a five-point Likert scale ranging from *Strongly Agree (5)* to *Strongly Disagree (1)*. Each item captured measurable indicators of digital search behavior such as the use of Boolean operators, application of database filters, evaluation of source credibility, and frequency of access to academic databases. The questionnaire also included open-ended questions that allowed participants to describe specific institutional challenges affecting information retrieval.

### **Validity and Reliability of the Instrument**

To ensure content validity, the draft questionnaire was reviewed by three experts: two from the Department of Library and Information Science and one from the Department of Business Education at the Federal College of Education, Yola. Their feedback helped clarify ambiguous statements and ensure that each item aligned with the study's objectives. The instrument was then pilot-tested with 20 business educators from Gombe State College of Education, who were excluded from the main study. Reliability was determined using Cronbach's Alpha, which produced coefficients of 0.86, 0.82, 0.79, 0.84, and 0.88 for the five subscales, resulting in an overall reliability coefficient of 0.84. These values indicate a high level of internal consistency and confirm that the instrument reliably measured the intended constructs. This level of reliability aligns with the acceptable threshold in information behavior research, where coefficients above 0.70 are considered satisfactory (Taber, 2018).

## **Data Collection Procedure**

Data collection took place over six weeks between January and February 2024. With prior authorization from institutional heads, printed questionnaires were distributed directly to participants through departmental coordinators and trained research assistants. Respondents were assured of confidentiality and anonymity to encourage honest responses. Where distance or scheduling posed a challenge, digital copies of the questionnaire were shared via email and through official WhatsApp groups used for academic communication. All completed questionnaires were checked for completeness and accuracy before data entry. Invalid or incomplete responses were removed, leaving 132 usable questionnaires for analysis. Ethical clearance was obtained from the Research Ethics Committee of the Federal College of Education, Yola. This ensured compliance with ethical standards concerning informed consent, voluntary participation, and the protection of respondent privacy.

## **Data Analysis Techniques**

Quantitative data were analyzed using both descriptive and inferential statistics with the Statistical Package for the Social Sciences (SPSS, Version 26.0). Descriptive statistics such as mean, standard deviation, and frequency distribution were used to summarize patterns in search skill proficiency, resource availability, and retrieval challenges. Inferential statistics, including one-way Analysis of Variance (ANOVA) and Pearson Product Moment Correlation ( $r$ ), were applied to test the hypotheses at a 0.05 level of significance. The ANOVA examined differences in mean responses among educators across the three business disciplines, including Accounting, Marketing, and Management, while the correlation analysis determined the relationship between search skills and effective retrieval of online information resources. Results were interpreted against theoretical expectations derived from digital literacy and information retrieval models.

## **Methodological Rigor and Limitations**

The methodological strength of this study lies in its comprehensive census approach and context-specific design, which provided a detailed empirical understanding of search skill variations in resource-limited academic environments. However, some limitations were acknowledged. Self-reported data may have introduced response bias, as certain participants could have overestimated their competencies. Infrastructural constraints in the study area also occasionally interrupted communication during data collection. Despite these challenges, triangulation through multiple validation strategies and a strong reliability coefficient enhanced the credibility, validity, and replicability of the findings.

## **RESULTS AND DISCUSSION**

### **Level of Search Skills Among Business Educators**

The results revealed that business educators in Adamawa and Taraba States possessed only moderate search skills. Most participants could perform simple keyword searches using general search engines such as Google or Yahoo. However, relatively few demonstrated competence in advanced search strategies such as Boolean logic, database filtering, and citation tracking. As shown in Table 1, the mean score for search skill proficiency ( $M = 2.84$ ,  $SD = 0.79$ ) indicates a moderate level of competence, suggesting partial familiarity but limited expertise. The mean score for the use of academic databases ( $M = 2.63$ ,  $SD = 0.81$ ) was even lower, reflecting limited engagement with structured academic platforms such as JSTOR or ERIC.

**Table 1: Descriptive Statistics of Key Variables (N = 132)**

Variable	Mean (M)	SD
Search Skill Proficiency	2.84	0.79
Availability of Online Resources	2.91	0.83
Digital Resource Utilization Pattern	3.02	0.76
Challenges in Information Retrieval	3.87	0.68
Strategies for Search Skill Optimization	3.75	0.72

*Source: Field Survey, 2024.*

The pattern in Table 1 suggests that while educators recognize the importance of online information retrieval, they lack advanced search literacy. These findings are consistent with those of Virkus (2016) and Olakunle & Olanrewaju (2021), who observed that many Nigerian educators remain at the basic literacy stage, relying on intuition rather than systematic search strategies.

### **Availability and Utilization of Online Information Resources**

Respondents rated the availability of online information resources as moderate. Most indicated access primarily to open access databases and institutional repositories. Subscription-based databases such as EBSCOhost, ScienceDirect, and Scopus were largely unavailable due to financial and infrastructural limitations. This finding supports Akinde (2021) conclusion that inadequate funding continues to marginalize Nigerian institutions within global academic networks. The utilization pattern, however, showed a slightly higher mean score ( $M = 3.02$ ), suggesting that educators made reasonable use of the limited resources available to them. Qualitative feedback indicated that open platforms such as Google Scholar and ResearchGate served as the main access points for research materials. Federal institutions reported higher utilization levels than state institutions, reflecting differences in infrastructure and library support. These results align with Olutola & Olatoye (2015), who found that Nigerian educators are eager to use digital tools but often face structural constraints that limit meaningful engagement. The overall pattern points to an adaptive yet constrained digital environment where creativity and improvisation compensate for limited access.

### **Challenges in Retrieving Online Information Resources**

A key finding of the study is the high level of challenges faced by educators in retrieving online materials ( $M = 3.87$ ). Respondents identified poor internet connectivity, high data costs, frequent power interruptions, and inadequate access to modern computers as the most critical barriers. Many also reported that they had not received institutional training on how to use academic databases effectively. This outcome corroborates Irenoa & Sawyerr-George (2022) and Martens et al. (2020) observation that infrastructural weaknesses and policy neglect contribute to persistent digital exclusion in northeastern Nigeria. The combined effect of these barriers discourages consistent use of online platforms and creates unequal opportunities for academic advancement within the same educational system.

### **Relationship Between Search Skills and Effective Retrieval**

Inferential analysis was conducted to examine whether search skills significantly influenced the effectiveness of online information retrieval. The Pearson correlation coefficient ( $r = 0.64, p < 0.01$ ) revealed a strong positive relationship between search proficiency and retrieval success. The one-way ANOVA comparing the mean responses of accounting, marketing, and management lecturers showed no statistically significant difference ( $F = 2.18, p = 0.12$ ). This result indicates that search-related challenges are consistent across business disciplines.

**Table 2. Inferential Statistics on Search Skills and Information Retrieval**

Statistical Test	Variables Compared	Coefficient / F-Value	p-Value	Interpretation
Pearson Correlation (r)	Search Skill ↔ Retrieval Effectiveness	0.64	0.001	Significant Positive Relationship
One-Way ANOVA (F)	Mean Differences among Business Disciplines	2.18	0.12	Not Significant (p > 0.05)

*Source: SPSS Output, 2024.*

These findings confirm the theoretical assumption of Eisenberg’s (2022) Information Literacy Framework, which emphasizes that proficient navigation of digital resources is central to academic productivity. Educators with stronger search literacy were more successful in retrieving relevant information, even in settings with limited infrastructure.

### Synthesis and Theoretical Implications

The integration of descriptive and inferential results reveals a coherent pattern. Search skills, resource accessibility, and institutional support operate as interdependent factors that shape how educators engage with digital information platforms. The evidence reinforces the conceptual model linking individual competence with infrastructural provision. When either component is weak, information retrieval efficiency declines. These results are consistent with Wilson’s (1999) information behavior model, which illustrates how personal motivation, environmental factors, and resource awareness interact to determine information use. Educators in Adamawa and Taraba States demonstrated motivation but were constrained by environmental and institutional factors. Effective policy interventions must therefore address multiple dimensions simultaneously. These include strengthening institutional infrastructure, integrating digital literacy into teacher education curricula, and creating incentives for lifelong information skill development.

### Interpretive Summary

The evidence presented in Tables 1 and 2 confirms that business educators possess basic but fragmented search competencies. Limited infrastructure and inadequate institutional support exacerbate this gap. Nevertheless, the statistical results indicate that improvements in search proficiency significantly enhance retrieval performance. These interrelated findings highlight the urgent need for coordinated interventions that combine training, access, and supportive policies to promote sustainable digital literacy among educators in Nigerian colleges of education.

### CONCLUSION

This study examined the search skills used for retrieving online information resources among business educators in colleges of education across Adamawa and Taraba States, Nigeria. Through descriptive and inferential analyses, it revealed a complex challenge that goes beyond technological limitations to include cognitive, pedagogical, and institutional dimensions. The evidence showed that educators demonstrate moderate proficiency in basic online searches but remain limited in their ability to apply advanced search strategies. Their efforts are further hindered by inadequate infrastructure and inconsistent institutional support. This dual constraint, encompassing skill limitation and infrastructural inadequacy—continues to impede access to scholarly information, thereby reducing teaching quality, research productivity, and professional growth. Correlation analysis confirmed a significant positive relationship between educators’ search skills and their ability to retrieve relevant online resources. This finding highlights the central role of digital literacy in effective information retrieval. Educators who can use structured search queries, filtering tools, and source evaluation techniques are better able to locate credible academic materials and apply them in teaching and research. In contrast, those with limited search competence remain confined to general web searches, which exposes them to unreliable and non-academic sources. Thus, information retrieval competence is not merely a technical capacity;

it is an intellectual skill that supports academic rigor and professional credibility. At the institutional level, the study identified systemic weaknesses that perpetuate digital inequality in Nigeria's teacher education sector. Colleges of education in Adamawa and Taraba States continue to experience poor ICT infrastructure, high internet costs, and inadequate subscriptions to scholarly databases. These structural barriers widen the digital divide between well-resourced and under-resourced institutions. The absence of formal training in information retrieval further worsens the problem, leaving many educators to rely on trial-and-error approaches. These conditions reaffirm the argument advanced by UNESCO that access to information depends on the interaction between cognitive skills, technological infrastructure, and institutional support.

Based on these findings, several recommendations are proposed. First, investment in digital infrastructure should be prioritized. Colleges of education should work with national research networks and ICT agencies to ensure stable internet connectivity and sustainable access to reputable databases. However, access alone is insufficient. Institutions must also invest in capacity building through continuous professional development. Regular workshops and seminars on advanced search strategies, database navigation, and citation management should be integrated into staff development programs. These activities should function as part of a continuous learning framework rather than as isolated training events. Second, library and information professionals should play a more active instructional role. Librarians need to collaborate with business education departments to design discipline-specific information literacy modules that teach educators how to evaluate sources, use metadata effectively, and apply digital citation tools. This approach will embed search literacy within the culture of teaching rather than treating it as a supplementary skill. Third, policy reforms are essential. The National Commission for Colleges of Education (NCCE) should include digital literacy standards in its accreditation and staff appraisal criteria. Such policy integration would institutionalize expectations that all educators maintain minimum search competence and regularly update their skills in line with technological change. In addition, partnerships with digital content providers and open-access initiatives should be encouraged to expand affordable access and reduce dependence on expensive commercial databases. Finally, future research should adopt mixed-method and longitudinal designs to examine how improved search skills influence measurable teaching and learning outcomes, such as student achievement or research productivity. Extending the investigation to other regions will provide comparative insight into digital literacy patterns across Nigeria and sub-Saharan Africa. In conclusion, search skills are not peripheral to educational practice; they are central to sustaining academic excellence in the digital era. Strengthening these competencies among business educators is both a professional necessity and a strategic path toward inclusive, data-driven education. Empowering educators with the knowledge and tools to navigate the global information landscape will not only enhance instructional quality but also narrow the persistent gap between developing institutions and the broader knowledge economy.

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Faith Gameli Ametefe: Conceptualization, Curation of Literature, Methodology, Data Analysis Validation and Writing-Original draft preparation; Ngozi Ibelegbu: Supervision, Conceptualization, Conceptualization, Methodology, Editing and Proof-reading of the manuscript; Alice Adamu Abalis: Conceptualization, Curation of Literature, Data Analysis and Writing-Original draft preparation; James Godspower: Methodology, Validation, Software, Editing and Proof-reading of the manuscript. Dawuda Solomon Sendere: Curation of Literature, Visualization and Writing-Original draft preparation; Stephen Emmanuel: Validation, Editing, Visualization and Writing-Original draft preparation.

## CONFLICT OF INTEREST DECLARATION

We certify that the article is the Authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This manuscript has not been submitted for publication nor has it been published in whole or in part elsewhere. We testify to the fact that all Authors have contributed significantly to the work, validity, and legitimacy of the data and its interpretation for submission to Jurnal Intelek.

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