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Software Internet Resource Tools and Research Writing Effectiveness of Postgraduate Business Education Students in Rivers State Universities

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ABSTRACT
The study investigated Software Internet Resource Tools and Research Writing Effectiveness of Postgraduate Business Education Students in Rivers State Universities. Two objectives, two research questions and two null hypotheses guided the study. The study adopted correlational study design. The total population of the study was 195. comprising of RSU 66 and IAUE 129. The sample size of the study consisted of the entire population of 195 respondents because, the population was manageable. Due to the small size of the population, there was no sampling. The data collection instruments for the study were two self-structured questionnaires titled "Software Internet Resource Questionnaire Tools (SIRTQ) and Research Writing Effectiveness of Postgraduate Business Education Students Questionnaire (RWEPBESQ)". The instruments was designed on a 4- point rating with options of strongly Agree (SA- 4 point), Agree (A-3 point), Disagree (D-2 points) and Strongly Disagree (SDA – 1point) respectively. The instruments was face and content validated by three experts from the department of Business Education of Measurement and Evaluation unit in the faculty of Education, Rivers State University, and tested for reliability using Cronbach Alpha statistics which yielded composite reliability index of 0.85 and 0.76 for the instruments. Out of 195 questionnaire distributed, 176 copies were retrieved and used for the study. Pearsons Product Moments Correlation Co-efficient (PPMC) was used to answer research questions and test the null hypotheses formulated at 0.05 level of significance. The study found that there is a strong positive significant relationship between Google scholar and research writing effectiveness of postgraduates Business Education students in Rivers State Universities, there is positive significant relationship between Grammerly and research writing effectiveness of postgraduates Business Education students in Rivers State Universities. Based on the finding of the study, the researchers recommended amongst other that Management should provide an improved infrastructure to ensure stable internet and functional ICT centers since Google scholar is cloud-based, and ineffective without connectivity. University management should organize hand-on workshop on Grammarly for editing and improving grammatical accuracy of student report writing.
Keywords: Effectiveness, Internet Resource Tools, Postgraduate Business Education Students, Research Writing, Software.

INTRODUCTION

The advancement of internet technologies has revolutionized the way information is accessed, processed, and utilized in educational and research contexts this means that the evolution of internet technologies has fundamentally reshaped how knowledge is created, accessed, and disseminated, particularly in academic environments. Previously, students and researchers relied heavily on print-based resources and physical libraries, which often limited access to updated materials and slowed the research process. However, with the rise of internet resource tools, the information landscape has become faster, broader, and more interactive, enabling users to access real-time, diverse, and credible academic content from virtually anywhere through software internet tools.

Software is a foundational element of modern computing, serving as the invisible engine that drives hardware functionality and enables human-computer interaction. Broadly defined, software refers to a set of instructions, programs, or data used to operate computers and execute specific tasks (Ystiana, Shofiya & Iftanti, 2024). It encompasses everything from system-level operations such as operating systems to application-level tasks like word processing, data analysis, and academic research support. software is not just a technical component, it is a strategic enabler of learning, research, innovation, and problem-solving particularly when linked to the internet.

Internet refers to a computer-based global information system comprising of many interconnected computer networks. (Britannica, 2015), According to Hartlevik, Guonmundsdofir and Loi (2015), the Internet is a network of networks" that consists of millions of smaller domestic, academic, business and government networks. The author further stated that the Internet is the transport vehicle for the information stored in files or documents on another computer. It carries together various information and services, such as electronic mail, online chat, file transfer, and the interlinked Web Pages and other documents of the World Wide Web (Aqil & Ahmad, 2011). In his view, Paul, (2014) stated that the Internet is a massive public spider web of computer connections. In the same vein, Chandran (2018), described the Internet as the worldwide publicly accessible network of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). The Internet has been described as a global reservoir of information and knowledge in a worldwide Network (Loc, 2013). While some other authors see it as an ocean of educational information resources, others see it as global reservoir of information in a worldwide network which provides information on various fields of endeavour. This implies that users of information can evaluate data through internet resource tools.

Internet resource tools refer to web-based platforms, applications, or services that enable users to locate, evaluate, manage, and share information online, especially for academic or professional purposes (Obasi & Ezeani, 2021). These tools are essential in supporting digital literacy, scholarly communication, research collaboration, and academic writing among students and researchers. According to Ogunmodede, Olalekan, and Falaye (2022), internet resource tools include online search engines digital libraries citation and reference managers academic networking platforms writing enhancement tools and research assistance tools. These platforms help to bridge the information gap, reduce the time spent on manual research processes, and provide access to current and credible scholarly materials for this study, the researcher considered Google scholar and Grammarly.

Google Scholar is a freely accessible web search engine developed by Google in 2004 to index scholarly literature across a wide array of disciplines and publishing formats. Over the years, it has become one of the most utilized academic search tools for students, educators, researchers, and policymakers, especially in developing countries where access to proprietary databases may be limited (Afolabi & Nwankwo, 2022). Google Scholar plays a critical role in facilitating academic research by serving as a centralized platform for discovering scholarly information across disciplines. As a freely accessible web-based search engine, it removes financial and institutional barriers that often restrict access to traditional academic databases like JSTOR, Elsevier's Scopus, or Web of Science. This feature is especially important in developing countries, such as Nigeria, where many institutions may not have adequate funding to subscribe to multiple high-cost academic databases.

According to Afolabi and Nwankwo (2022), the platform's open-access model enhances democratization of knowledge by enabling postgraduate students, lecturers, and independent researchers to access a wide range of academic materials including peer-reviewed journal articles, theses, dissertations, conference papers, books, patents, and court opinions without requiring a subscription or university login. This unrestricted access supports equity in academic participation, giving scholars from underfunded institutions the same foundational access to research as those from wealthier universities. Additionally, Google Scholar's simple user interface, integration with citation tools, and ability to track citations and author metrics contribute to its usability and popularity in the academic world. These features help users not only to discover relevant literature but also to assess the impact and credibility of sources. Afolabi and Nwankwo (2022) emphasize that the platform has become indispensable in supporting evidence-based research, literature review development, and citation analysis, particularly among postgraduate students who require comprehensive access to scholarly material during thesis and dissertation writing. Moreover, the interdisciplinary nature of Google Scholar means it indexes content from various subject areas business, education, health, engineering, and the humanities making it a one-stop platform for multi-disciplinary research. This breadth makes it especially valuable for business education students who often need to explore related fields such as economics, information systems, entrepreneurship, and organizational behavior.

According to Ngulube and Ukwoma (2023), Google Scholar indexes peer-reviewed journal articles, theses, books, conference papers, technical reports, and patents. Its vast coverage and user-friendly interface have made it indispensable for postgraduate students engaged in thesis writing and literature reviews. The platform aggregates scholarly material from publishers, academic societies, online repositories, and university websites, making it an essential hub for academic discovery and citation tracking. Google Scholar has evolved into a central platform for academic research and scholarly engagement, especially among postgraduate students. As noted by Ngulube and Ukwoma (2023), the platform indexes a comprehensive range of scholarly content, including peer-reviewed journal articles, theses, dissertations, academic books, technical reports, conference proceedings, and patents. This wide-ranging indexing capability provides users with access to a multidisciplinary knowledge base, making it suitable for virtually all fields of study.

A major strength of Google Scholar lies in its aggregative nature. It collects academic materials from a variety of credible sources: commercial publishers, academic societies, university repositories, open-access journals, and preprint servers. This ensures that users are not confined to one publishing outlet or institution but can explore a broad spectrum of scholarly viewpoints and emerging research trends. According to Ngulube and Ukwoma (2023), this feature has made Google Scholar especially valuable for developing countries, where many universities face funding limitations that restrict access to premium databases like Scopus or Web of Science.

Grammarly is a sophisticated digital writing assistant tool that leverages artificial intelligence (AI) and natural language processing (NLP) to help users improve the quality, clarity, and correctness of their written communication. It functions as a real-time proofreader, offering grammar, punctuation, and spelling corrections, as well as suggestions for style, tone, and conciseness (Choudhury & Bose, 2022). Grammarly is widely used by students, researchers, educators, and professionals to enhance their writing across various platforms including Microsoft Word, Google Docs, and web browsers. According to Al-Adwan et al. (2023), Grammarly has become an essential tool in academic writing, especially among non-native English speakers, as it provides contextual feedback that promotes independent learning and helps users develop their language proficiency. The tool goes beyond surface-level corrections by offering explanations for suggested changes, thus encouraging reflective revision and deeper understanding of English grammar rules. For postgraduate students, Grammarly serves a dual role: it supports the development of academic writing competence and acts as a self-directed learning resource. Ibrahim and Yusuf (2021) found that the adoption of Grammarly significantly improved the structure, coherence, and academic tone of students' research papers. Its plagiarism detection feature also helps in ensuring originality, which is critical for upholding academic integrity in thesis writing and scholarly publications.

Furthermore, Grammarly's integration with educational technologies and learning management systems (LMS) has contributed to its growing adoption in higher education. Institutions now recommend Grammarly to support students in developing the writing skills necessary for success in academic and professional settings. Obi and Eze (2022) emphasized that the tool is particularly valuable for business education students who are expected to produce formal documents such as reports, proposals, and policy briefs with precision and professionalism. Despite its advantages, some scholars argue that over-reliance on Grammarly may inhibit the development of critical editing skills. Kumar and Samuel (2023) caution that while Grammarly is a useful aid, it should complement, not replace, traditional writing instruction and personal editing skills. Educators are encouraged to integrate Grammarly into pedagogy while also teaching foundational writing competencies.

Grammarly is more than just a grammar checker it's an intelligent writing assistant designed to elevate the quality of digital writing across diverse contexts, including academia, business, and personal communication. Its sophisticated algorithms utilize artificial intelligence (AI) and machine learning (ML) to provide real-time feedback on grammar, punctuation, spelling, sentence structure, tone, and clarity. This makes Grammarly a versatile tool not only for correcting errors but also for enhancing the overall coherence and professionalism of a document (Choudhury & Bose, 2022). In academic settings, Grammarly has proven especially beneficial to postgraduate students. These learners are often expected to produce research papers, dissertations, and journal articles that adhere to high standards of academic writing. For many, especially non-native English speakers, tools like Grammarly help bridge the gap between their language proficiency and the demands of scholarly communication (Al-Adwan et al., 2023). The tool provides contextual explanations, enabling users to understand the rationale behind suggested changes. This feature is particularly valued in educational contexts because it promotes learning through revision, rather than blind acceptance of corrections.

Additionally, Grammarly's plagiarism detection feature is a critical asset in promoting academic integrity. It checks written work against a large database of web pages and academic papers to identify unoriginal content. According to Ibrahim and Yusuf (2021), this helps postgraduate students ensure their work is original, properly cited, and compliant with institutional policies. From a pedagogical standpoint, Grammarly is also being integrated into digital literacy programs and learning management systems. Institutions are now encouraging its use as part of self-directed writing improvement strategies. For instance, Obi and Eze (2022) note that many Nigerian universities have adopted Grammarly as a recommended tool for Business Education students, particularly because these students are expected to communicate professionally in formal documents such as memos, proposals, and project reports.

However, not all feedback on Grammarly is wholly positive. Critics like Kumar and Samuel (2023) warn against over-reliance on automated tools. They argue that depending solely on Grammarly could hinder students' ability to independently develop editing and proofreading skills. Therefore, educators are advised to combine Grammarly with explicit instruction in writing and critical thinking, ensuring that students gain both technical support and foundational language knowledge. Grammarly supports academic success by improving writing accuracy, fostering independent learning, and enhancing research output. When used strategically, it contributes significantly to developing 21st-century communication and ICT skills among postgraduate students.

Statement of the Problem

In the contemporary academic environment, postgraduate research is increasingly shaped by the adoption and utilization of software internet resource tools that enhance efficiency, accuracy, and scholarly engagement. Among Business Education postgraduate students in Rivers State universities, the integration of digital tools such as Google Scholar and Grammerly has become crucial for knowledge creation, academic writing, literature review, referencing, collaboration, and overall research productivity. These tools are designed to assist students in overcoming common research-related challenges such as grammatical error, lack of access to quality scholarly materials, poor referencing skills, and limited collaborative opportunities.

Despite their relevance, there is a growing concern that postgraduate Business Education Students may not be effectively utilizing these tools to their full potential. Google Scholar and Grammerly provide access to a wide pool of scholarly resources, students often underutilize them, either due to lack of awareness, inadequate digital literacy, or preference for traditional library sources. This situation poses a significant challenge to the academic and professional development of postgraduate students, especially in Business Education where employability competency, digital adaptability, and scholarly output are increasingly emphasized. If students fail to harness the potential of these tools, they stand the risk of producing substandard research, limiting their contribution to knowledge, and reducing their competitiveness in the global academic and professional landscape. There is a correlation between those who used Google Scholar and Grammerly those who do not use them and their academic performance. Consequently, there is a pressing need to investigate the extent to which postgraduate Business Education students in Rivers State universities utilize software internet resource tools in their research, with specific focus on Google Scholar and Grammerly.

Purpose of the Study

The purpose of this study was to investigate Software Internet Resource Tools and Research Writing Effectiveness of postgraduate Business Education students in Rivers State universities. Specifically, the study sought to:

1. Determine how Google Scholar relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universities.
2. Determine how Grammerly relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universities.

Research Questions

The following research questions guided the study:

1. How does Google Scholar relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universities.
2. How does Grammerly relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universities.

Hypotheses

The following null hypotheses formulated were test at 0.05 levels of significance:

1. There is no significant relationship between Google Scholar and research writing effectiveness of postgraduates Business Education students in Rivers State Universities.
2. There is no significant relationship between Grammerly and research writing effectiveness of postgraduates Business Education students in Rivers State Universities.

METHODOLOGY

The study adopted correlational research design. According to Ogwunte (2023), correlational research design aims to identify and analyse the relationship between two or more variables without manipulating them. The study was conducted in Rivers State Universities (RSU) and Ignatius Ajuru University of Education (IAUE). The population of this study comprised 195 postgraduate students enrolled in Business Education programmes (MEd, MS.c. & PhD) during the 2024/2025 academic session at Rivers State University and Ignatius Ajuru University of Education, all in the Faculty of Education.The entire population of 195 was adopted for the study as a sample size. This is because the entire population was small and manageable, as such there no sampling technique adopted. The instruments for data collection consisted of two self-made Questionnaires titled: "Software Internet Resource Tools (SIRTQ) and Research Writing Effectiveness of Postgraduate Business Education Students in Rivers State Universities (RWEPBSQ)". The questionnaire was divided into two sections. Section A elicited demographic information about respondents and Section B contained items related to the five dimensions software internet Resource Tools and Research Writing Effectiveness of Postgraduate Business Education Students in Rivers State Universities. The instruments employed 4-point Likert scale with response options of: Strongly Agree (SA-4points), Agree (A-3points), Disagree (D-2points), and Strongly Disagree (SD-

1Point) respectively. The instrument was subjected to face and content validation by three experts, two from Business Education and one from Measurement and Evaluation. All from Faculty of Education, Rivers State University. To establish reliability of the instrument, a pilot study was carried out. The questionnaire was distributed to 20 Postgraduate Business Education students in Nnamdi Azikiwe University, Awka in Anambra State, which is outside the area of the study. The instrument was administered once to the group. The data collected were analyzed using Cronbach Alpha Statistic Method to determine the internal consistency of the instrument which yielded reliability of co-efficient of 0.85 and 0.76. Out of 195 copies of the instruments distributed, 176 copies were complete filled and retrieved on the spot from the respondents on each day of visit otherwise requested by respondents and used for data analysis of the study. The collected data was analyzed using Person Product Moment Correlation (PPMC) to answer research questions and test the null hypotheses formulated, while t-ratio transformation associated will the correlation coefficients for each research question was tested with the corresponding hypothesis at 0.05 level. The decision rule was that:

i. 0.8 – 1.0 Very Strong Relationship
ii. 0.6 – 0.79 Strong Relationship
iii. 0.4 – 0.59 Moderate Relationship
iv. 0.2 – 0.39 Weak Relationship
v. 0.0 – 0.19 Very Weak or No Relationship

RESULTS

Research Question 1: *How does Google Scholar relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universities?*

Table 1: Calculated r of the Relationship that exists between Scholar and research writing effectiveness of postgraduate Business Education students in Rivers State Universities (N= 176)

		Google Scholar	Research writing effectiveness of postgraduate Business Education students
Google Scholar	Pearson Correlation	1	.752**
	Sig. (2-tailed)		.001
	N	176	176
Research writing effectiveness of postgraduate Business Education students	Pearson Correlation	.752**	1
	Sig. (2-tailed)	.001	
	N	176	176

Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS 21.0 Data Output, 2026

Table 1 presents the calculated coefficient (r) value based on responses among Business Education students, examining the relationship between Google Scholar relates with research writing effectiveness of postgraduate Business Education students. The table indicates a calculated r value of .752, which signifies that there is a positive, strong relationship between Google Scholar and research writing effectiveness of postgraduate Business Education students in Rivers State Universities.

Research Question 2: *How does Grammerly relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universities.*

Table 2: Calculated r of the Relationship that exists between Grammerly and research writing effectiveness of postgraduate Business Education students in Rivers State Universities (N= 176)

		Grammerly	Research writing effectiveness of postgraduate Business Education students
Grammerly	Pearson Correlation	1	.727**
	Sig. (2-tailed)		.001
	N	176	176
Research writing effectiveness of postgraduate Business Education students	Pearson Correlation	.727**	1
	Sig. (2-tailed)	.001	
	N	176	176

**. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS 21.0 Data Output, 2026

Table 2 presents the calculated coefficient (r) value based on responses among Business Education students, examining the relationship between grammerly and research writing effectiveness of postgraduate Business Education students. The table indicates a calculated r value of .727 which signifies a positive strong relationship that exist between grammerly relates with research writing effectiveness of postgraduate Business Education students in Rivers State Universoties.

Hypothesis 1

There is no significant relationship between Google Scholar and research writing effectiveness of postgraduates Business Education students in Rivers State Universities\

Table 3: Calculated r of the Relationship that exists between Google Scholar and research writing effectiveness of postgraduates Business Education students in Rivers State Universities (N= 176)

		Google Scholar	Research writing effectiveness of postgraduate Business Education students
Google Scholar	Pearson Correlation	1	.752**
	Sig. (2-tailed)		.001
	N	176	176
Research writing effectiveness of postgraduate Business Education students	Pearson Correlation	.752**	1
	Sig. (2-tailed)	.001	
	N	176	176

**. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS 21.0 Data Output, 2026

The results shown in Table 3 above, with a calculated coefficient (r) value of .752, means that a positive, strong and significant relationship exist between Google Scholar and research writing effectiveness of postgraduates Business Education students. The association is significant at p-value = 0.001 <0.0.5 significance level. This means that the stated null hypothesis (i.e. Ho_3) is rejected. This implies that there is a positive, weak and significant association between Google Scholar and research writing effectiveness of postgraduates Business Education students in Rivers State Universities.

Hypothesis 2

1. There is no significant relationship between Grammerly and research writing effectiveness of postgraduates Business Education students in Rivers State Universities.

Table 4: Calculated r of the Relationship that exists between Grammerly and research writing effectiveness of postgraduates Business Education students in Rivers State Universities (N= 176)

		Grammerly	Research writing effectiveness of postgraduate Business Education students
Grammerly	Pearson Correlation	1	.727**
	Sig. (2-tailed)		.001
	N	176	176
Research writing effectiveness of postgraduate Business Education students	Pearson Correlation	.727**	1
	Sig. (2-tailed)	.001	
	N	176	176

**. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS 21.0 Data Output, 2026

From the result in Table 4, it is shown that a positive, strong and significant relationship exists Grammerly and research writing effectiveness. The calculated coefficient (r) value .727 indicates a positive, strong and significant relationship, it is also significant at p-value of .001 <0.05. Therefore, based on empirical findings, the null hypothesis earlier stated (i.e. HO_1) is hereby rejected. Thus, there is a positive, strong and significant relationship between relationship between Grammerly and research writing effectiveness of postgraduates Business Education students in Rivers State Universities.

DISCUSSION OF FINDINGS

The finding of research question one and hypotheses one revealed that there is a significant relationship between Google Scholar and research writing effectiveness of postgraduates Business Education students in Rivers State Universities, as strong relationship was recorded. This shows that Google scholar enhanced literature access, currency of references and theoretical grounding. This finding is consistent with Jamali and Navabi (2015), who described Google scholar as the primary gateway to academic literature in developing counties. The study also confirms Aharya et al (2014), who opined that free access to metadata reduces the research poverty gap among students. However, limited full-text access without institutional concern support Adriaans and Rensleigh (2013), who submitted that Google scholar effectiveness in Nigeria is constrained by paywalls, explaining why some students combined it with ResearchGate.

The findings of research questions two and hypotheses two revealed that there is a significant relationship between Grammerly and research writing effectives of postgraduate business Education students in Rivers state Universities, but the relationship is a strong one. The result further showed that Grammerly significantly improve grammatical accuracy, clarity and mechanics. This finding is inline with Ghunfrion and Rosyida (2018), who reported that Grammerly reduce surface level error in students writing to about 45%. In the context of Rivers State Universities, Postgraduate Business education often struggle with academic tone and sentence structure. Grammerly real-time feedback acted as a "writing coach". Also, this finding corroborates with the findings of Barrot (2022), who posited that automated writing evaluation tools increases self-editing skills and writing confidence. However, this finding also supports the report of Koltoskia (2020), who submitted that over-reliance without meta cognitive engagement leads to passive acceptance of suggestions. Thus, while Grammarly enhance effectiveness, its impact on

interpreting feedback. Confirming this, Godwin (2022) opined that tool efficiency is mediated by digital literacy.

CONCLUSION

Based on the findings of the study it was concluded that the combined use of the Internet resource tools addresses the core dimensions of research writing such as language quality, originality, literature access, scholarly engagement, and referencing accuracy. Postgraduate Business Education students in Rivers State Universities who integrated Google Scholar and Grammerly into their research process showed statistically significant improvements in writing effectiveness. However, effectiveness is moderated by digital literacy, training and ethical usage.

RECOMMENDATIONS

Based on the finding of the study, the following recommendations were made.

1. Management should provide an improved infrastructure to ensure stable internet and functional ICT centers since Google scholar is cloud-based, and ineffective without connectivity.
2. University management should organize hand-on workshop on Grammarly for editing and improving grammatical accuracy of student report writing.

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