JOURNAL OF RESEARCH IN INDUSTRIAL TECHNOLOGY & EDUCATIONAL STUDIES (JRITES)
Homepage: http://Journals.unizik.edu.ng/index.php/jrites
e-ISSN 3122-0436
Vol 2 Issue 1 (2026) 42-48

Utilization of Web Based Research Management Applications for Research by Postgraduate Students of Business Education in South East, Nigeria

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Abstract: This study investigated the utilization of web-based research management applications by postgraduate students of Business Education in South-East Nigeria. One research question guided the study and one hypothesis was tested. A descriptive survey design was employed, covering the entire population of 141 postgraduate students from six public universities. Data were collected using a structured questionnaire and analyzed with mean, standard deviation, and t-test statistics at a 0.05 significance level. The results showed that students use web-based research management applications to a moderate extent. Further findings revealed that gender significantly affected usage, with male students using the tools more than female students, while age had no significant effect. The study concluded that postgraduate students of Business Education in South-East Nigeria utilize web-based research management applications to a moderate extent. Based on these findings, the study recommended among others that administrators of universities and departments of Business Education should organize regular workshops and training sessions to improve postgraduate students' awareness and competence in the use of web-based research management applications such as Mendeley, Zotero, and EndNote.

Key words: Applications, Web-Based Research Management, Postgraduate Students, Business Education, Research

INTRODUCTION

Education serves as the foundation of national growth and development, equipping individuals with the knowledge, skills, and values necessary for personal advancement and societal progress. In Nigeria, education is structured into basic, post-basic, and tertiary levels, with universities representing the pinnacle of the system. Universities play a vital role in human capital development by providing advanced knowledge, research training, and skills essential for social, economic, and political transformation. They offer both undergraduate and postgraduate programmes, with postgraduate education focusing on specialized study and research that deepen learners' understanding and contribute to knowledge creation. Postgraduate students, therefore, engage in independent research activities such as dissertations or collaborative projects, preparing them for professional or academic careers that demand critical thinking and innovation.

Research is a central component of postgraduate education. Research is a systematic process of inquiry aimed at generating new knowledge or refining existing understanding. It involves collecting and analyzing data to answer questions, solve problems, or extend theoretical frameworks (Creswell and Creswell, 2018). Scholars such as Booth, Colomb, and Williams (2016) and Flick (2018) view research as a reflective and collaborative process that promotes intellectual advancement and practical solutions. Within the educational context, research enhances teaching, learning, and policy formulation,

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particularly in specialized fields like business education. Business education, a vital component of vocational and tertiary training, equips individuals with the knowledge, skills, and attitudes necessary for entrepreneurial and managerial success. It prepares learners for both employment and self-employment by fostering competencies in business management, economic participation, and practical enterprise skills (Edokpolor and Egbri, 2017; Dambo and Ibitoroko, 2022). Thus, through education, research, and business training, universities significantly contribute to human and national development.

Business education covers diverse areas such as accounting, management, marketing, and office information management, all of which are designed to develop employability and entrepreneurial skills (Wolugbom, 2017). At the postgraduate level, the programme offers specializations in accounting education, office technology and management, and marketing education, focusing on equipping learners with advanced knowledge and competencies relevant to the world of work. Postgraduate business education fosters leadership, innovation, and global awareness (Roobeek and Ritter, 2016; Ezenwafor and Onoakpunu, 2017). Its research component integrates educational research principles to improve teaching methodologies, curriculum development, and learning outcomes. By engaging in applied and theoretical research, postgraduate students contribute to advancing business education and addressing practical challenges in the academic and industrial sectors. Effective research practice in this field increasingly relies on Information and Communication Technology (ICT) and web-based applications like research management tools.

Research management tools are digital systems that assist researchers in organizing, conducting, and sharing their work efficiently throughout all stages of the research process. They provide structured platforms for managing literature, references, data, collaboration, and publication. According to Bosman and Kramer (2019), these tools streamline research workflows and enhance coordination among scholars, while Hinchliffe (2019) highlighted their ability to support teamwork and track project progress in real time. Piwowar and Priem (2019) further noted that research management applications simplify literature discovery, citation management, and research networking, helping scholars maintain accuracy and consistency in their work. Common examples include Mendeley and Zotero for reference organisation and citation; Overleaf, a cloud-based writing tool for collaborative document preparation; and ResearchGate, a professional platform for sharing research outputs and fostering academic connections. As Visser and Moed (2019) observed, these tools have become indispensable in modern academia by improving productivity, promoting global collaboration, and enhancing the visibility and accessibility of research outcomes in an increasingly digital research environment.

Despite the global benefits of web-based applications, many postgraduate business education students in South East Nigeria underutilize these tools, facing difficulties in accessing and applying online information effectively (Olateju, 2019). This limited adoption often delays research completion and reduces the quality of academic output. Several studies have identified factors influencing this utilisation, including gender and age. Research by Whitmore et al. (2015) and Odewunmi et al. (2019) found that male students generally exhibit greater proficiency and frequency in using internet resources for academic purposes, while Crocco et al. (in Whitmore et al., 2015) and Mommoh and Gomina (2023) reported no significant gender differences. Similarly, studies by Apuke and Tunca (2020) and Osuchukwu et al. (2017) suggested that younger students are more adept at using digital technologies, accessing e-resources more frequently than their older counterparts. However, the relationship between age, gender, and the utilization of web-based research applications among postgraduate students in universities in South East Nigeria remains underexplored based on literatures reviewed by the researcher. This gap necessitates empirical investigation into the extent of utilization of web-based assessment applications for research among postgraduate business education students in South East Nigeria.

Statement of the Problem

The advancement of technology has transformed research practices globally, enabling postgraduate students to access, manage, and disseminate information more efficiently through web-based research management applications such as Mendeley, Zotero, Overleaf, and ResearchGate. These tools have become essential for improving research productivity, promoting collaboration, and ensuring

effective management of scholarly activities. However, despite their numerous advantages, there are indications that many postgraduate students of Business Education in South East Nigeria have not fully embraced or effectively utilised these applications in their research work. Observations and informal interactions with postgraduate students reveal that many still rely on manual methods of data organisation, referencing, and literature management, which often result in delays in completing research projects, poor organisation of academic work, and low research output.

Furthermore, factors such as limited digital literacy, inadequate access to reliable internet facilities, and a lack of institutional support for training on digital research tools may contribute to the underutilization of these applications. Previous studies have suggested that variables such as gender, age, and level of technological exposure influence the use of web-based tools for academic purposes, yet there is little empirical evidence on how these factors affect the use of research management applications among postgraduate students of Business Education in South East Nigeria. This gap in knowledge raises concern, as ineffective utilisation of web-based research tools could impede students' academic progress and diminish the overall quality of research output in Nigerian universities. Therefore, this study seeks to investigate the extent to which postgraduate students of Business Education in South East Nigeria utilise web-based research management applications for their research activities.

Research Question

To what extent do postgraduate students of business education utilize web based research management applications for research in South East, Nigeria?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of male and female postgraduate students of business education on the extent they utilize web based research management applications for research in South East, Nigeria.
2. There is no significant difference in the mean ratings of postgraduate students of business education on the extent they utilize web based research management applications for research in South East Nigeria based on age.

METHOD

This study adopted a descriptive survey research design, suitable for collecting data on current practices and opinions of postgraduate Business Education students regarding their utilization of web-based research management applications in South-East Nigeria. The study area covered the five states of the South-East geopolitical zone: Abia, Anambra, Ebonyi, Enugu, and Imo, known for their active postgraduate programmes in Business Education. The population comprised 141 postgraduate students of Business Education from six public universities in the region for the 2024/2025 academic session. Due to the manageable size, a census approach was used to include the entire population. Data were collected using a structured questionnaire titled "Utilization of Web-Based Research Management Applications Questionnaire (UWBRMAQ)," which consisted of two sections: demographic data and 8 items on extent of utilization of web-based research management applications. Responses were rated on a 5-point Likert scale ranging from Very High Extent (5), High Extent (4), Moderate Extent (3), Low Extent (2) and Very Low Extent (1).

The instrument was validated by three experts in Business Education and Measurement and Evaluation, leading to minor adjustments. Reliability was established through a pilot test involving 20 postgraduate students from Delta State University, yielding Cronbach Alpha coefficient of 0.87. Out of 141 copies of questionnaires distributed to respondents, 133 copies (representing 94 percent) were properly filled. Out of the remaining eight copies, six copies were not properly filled and two copies were not returned, making up the remaining six percent. Data were analysed using mean and standard deviation to answer the research questions, while t-test statistics tested the null hypotheses at a 0.05 significance level. The decision rule for analyzing the research question was based on the real limit of numbers. The t-test was used to test the null hypotheses at 0.05 level of significance. A null hypothesis

was rejected where the calculated p-value is less than the 0.05 level of significance; it means that there is significant difference. Conversely, where the calculated p-value is greater than or equal to the level of significance (0.05), it means that there is no significant difference and the hypothesis is not rejected.

RESULTS

Extent Postgraduate students of business education in south-east Nigeria utilize web-based research management applications for research

Table 1: Responses on Extent Postgraduate Students Utilize Web-Based Research Management Applications

S/No.	extent of usage of:	$\bar{X}$	SD	Remarks
1.	EndNote	3.18	1.43	Moderate Extent
2.	Mendeley	2.86	1.37	Moderate Extent
3.	Evernote	2.89	1.42	Moderate Extent
4.	Zotero	2.94	1.32	Moderate Extent
5.	Grammarly	3.41	1.42	Moderate Extent
6.	Mind Meister	2.79	1.32	Moderate Extent
7.	Todoist	2.81	1.50	Moderate Extent
8	Notion	2.93	1.57	Moderate Extent
	Grand mean	**2.98**		

Source: Field Survey Data 2025

Data in Table 1 shows that items 1 to 8 have mean scores of 3.18, 2.86, 2.89, 2.94, 3.41, 2.79, 2,81 and 2.93 which indicates moderate extent. This suggests that postgraduate students of business education in south-east Nigeria, utilize web-based research management applications inconsistently. The grand mean of 2.98 indicates that respondents on average, utilize web-based research management applications occasionally while the standard deviation values shows that although the responses was moderate, respondents did not all agree which led to a wider spread of answers.

Hypothesis 1: There is no significant difference in the mean ratings of male and female postgraduate students of business education on the extent they utilize web-based research management applications for research in South East, Nigeria.

Data obtained in respect to hypotheses 1 were analyzed and presented in Table 2 below:

Table 2: T-Test on the Mean Ratings of Postgraduate Students on the Extent They Utilize Web-Based Research Management Applications Based on Gender

Variables	Gender	N	M	S.D	Df	t	P-value
	Male	44	3.25	1.081			
ResMgtWeb					131	2.162	0.032
	Female	89	2.84	0.993			

Source: Field Survey Data 2025

Table 2 shows that, web-based research management applications is significant (t=2.162, p=0.032<0.05). Thus, there is gender differences in the use of web-based research management applications for research among postgraduate students of business education in south-east Nigeria.

Hypothesis 2: There is no significant difference in the mean ratings of postgraduate students of business education on the extent they utilize web-based research management applications for research in South East Nigeria based on age.

Data obtained in respect to hypotheses 2 were analysed and presented in Table 3 below:

Table 3: T-Test on the Mean Ratings of Postgraduate Students on the Extent They Utilize Web-Based Research Management Applications Based on Age

Variables	Age	N	M	SD	Df	T	p-value
ResMgtWeb	20-40	62	3.13	1.044	131	1.606	0.111
	Above 40	71	2.85	1.019			

Source: Field Survey Data 2025

Table 3 shows web based research management applications is not significant (t=1.606,p=0.111>0.05). Thus, there is no differences in the respondent's opinion of the extent of their utilization of web-based research management applications for research among postgraduate students of business education in South-East Nigeria.

DISCUSSION

The findings of the study revealed that postgraduate students of Business Education utilize web-based research management applications only occasionally, indicating a generally low level of adoption. This limited usage may be attributed to inadequate awareness, insufficient training, or a continued preference for familiar traditional methods such as manual referencing. The occasional use further implies that while these students acknowledge the existence of research management applications, they have not fully integrated them into their research routines. This finding supports the report of Pathak and Johnson (2018), who observed that most students were unaware of the availability and benefits of research management tools. Similarly, Bugyei et al. (2019) found that the adoption and effective use of such applications among postgraduate students remain very low, while Akerele and Giwa (2024) reported only a moderate level of awareness and utilization of tools such as Mendeley and Zotero. However, the present study contrasts with the findings of Parabhoi et al. (2018), who indicated that Mendeley and Zotero have become widely used open-source software among postgraduate researchers in recent years. The study further revealed that gender significantly influences the utilization of web-based research management applications among postgraduate students of Business Education. This suggests that male and female students differ in their adoption and use of these tools. This result aligns with Oragbon (2016), who found that gender plays a significant role in shaping postgraduate students' attitudes toward the use of digital research resources. A plausible explanation is that male postgraduate students may exhibit greater confidence and curiosity in experimenting with digital tools for research management, whereas female students may be more comfortable relying on conventional or manual referencing approaches. Finally, the study showed that there is no significant difference in the utilization of web-based research management applications across age groups among postgraduate students of Business Education. This indicates that age does not strongly determine students' adoption or frequency of use of these tools, as both younger and older students tend to exhibit similar levels of engagement.

CONCLUSION

The study concluded that postgraduate students of Business Education in South-East Nigeria utilize web-based research management applications to a moderate extent. This suggests that while students are aware of such tools, they have not fully integrated them into their research practices, possibly due to limited digital literacy, lack of institutional support, or inadequate exposure to the benefits of these applications. The study also established that gender significantly influences the use of web-based research management applications, with male students showing higher usage tendencies than their female counterparts. However, age was found not to have a significant effect on the utilization of these tools.

RECOMMENDATIONS

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

1. Administrators of Universities and departments of Business Education should organize regular workshops and training sessions to improve postgraduate students' awareness and competence in the use of web-based research management applications such as Mendeley, Zotero, and EndNote. This will address the low level of utilization observed among students.
2. Faculty management and postgraduate schools should implement gender-sensitive digital literacy programmes to encourage equal participation of both male and female students in the use of these tools, thereby minimizing the gender disparity found in the study.
3. University libraries and ICT units should provide adequate access to internet services, updated software, and technical support to enhance effective use of research management applications by postgraduate students.

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