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Research Article

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Attitude of Postgraduate Student Towards Technology-Based Tools for Research and Data Analysis in Rivers State

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Abstract

The study examined postgraduate students' attitudes toward technology-based research and data analysis tools in Rivers State, using a descriptive survey design. It had two hypotheses and used a sample of 400 from a population of 11,683 postgraduate students in three government-owned universities in Rivers state, selected through proportionate stratified random sampling. Data were collected via a questionnaire titled, Attitudes towards Technology-Based Research and Data Analysis Tools Questionnaire (ATBRDATQ) and administered both in-person and online. The instrument's reliability (0.770) was confirmed using Cronbach's Alpha, and its validity was assessed by experts. Mean scores and ANOVA were used for data analysis; the hypotheses were tested at 0.05 level of significance. Data analysis was conducted using Jamovi and SPSS. Findings revealed variations, in the attitude of postgraduates towards technology-based tools for research and data analysis, based on school and age. It was recommended that administrators should conduct focus groups and surveys to address these differences.

Keywords: Research, Data Analysis, Technology-Based Tool, Postgraduate Students, Attitude

1. Introduction

The rapid advancement of technology has significantly transformed academic research, making digital tools essential for efficient data analysis and scholarly work. Postgraduate students, as key contributors to academic research, are expected to leverage technology-based research tools to enhance the quality and efficiency of their work. However, the attitude of students toward these tools varies based on factors such as exposure, perceived usefulness, and ease of access.

Attitude, in this context, refers to students' perceptions, willingness, and enthusiasm toward adopting digital research tools. It encompasses their readiness to explore, utilize, and integrate these tools into their research activities. While some students readily embrace technology-based research tools, others exhibit reluctance due to factors such as fear of complexity, lack of digital literacy, or skepticism about the reliability of such tools.

Despite the increasing internet penetration and technological advancements in Nigeria, research suggests that many postgraduate students still rely on traditional methods, showing resistance to adopting modern digital tools. This resistance could be attributed to inadequate awareness, lack of institutional support, or personal preferences. Understanding the attitudes of postgraduate students toward technology-based research tools is crucial in addressing potential barriers and promoting a more efficient research culture.

This study aims to explore the attitudes of postgraduate students in Rivers State toward technology-based research tools. It seeks to identify factors influencing their attitudes, potential barriers to adoption, and possible interventions that could enhance positive attitudes toward digital research tools. By examining these aspects, the study contributes to the broader discourse on improving research efficiency in higher education through technology adoption. Postgraduate students rely on various technology-based

tools to facilitate research and data analysis. These tools enhance data collection, analysis, literature review, and presentation. Some commonly used tools include:

Google Scholar: A scholarly search engine that helps students find academic papers, journals, books, and theses, aiding in literature review and qualitative research.

Google Forms: An online tool for creating surveys and collecting responses, which integrates with Google Sheets for data management.

Microsoft Excel: A spreadsheet programme used for organizing, analyzing, and visualizing data through statistical functions and graphical representations.

EBSCO Information Services, Taylor & Francis Online, Springer Link, Sage Online Journals, PubMed: Digital libraries providing access to a wealth of academic research across various disciplines.

ResearchGate, Academia.edu, and AJOL: Platforms where researchers share papers, collaborate, and access peer-reviewed articles.

DupliChecker and Grammarly: Tools that assist in plagiarism detection and writing quality enhancement, ensuring research integrity.

Microsoft PowerPoint: Used for presenting research findings through structured slideshows with multimedia support.

Attitude is a psychological construct encompassing beliefs, emotions, and behavioural tendencies toward an object [1]. In the context of postgraduate students, attitude toward technology-based research tools influences their willingness to adopt and effectively use them. The Technology Acceptance Model (TAM), proposed by Fred Davis in 1989, explains how individuals perceive and adopt new technology [2]. It highlights the role of attitude in technology acceptance, showing how perception influences adoption. TAM identifies perceived usefulness (belief that technology enhances productivity) and perceived ease of use (belief that technology is effortless) as key factors influencing technology adoption. TAM explains postgraduate students' attitudes toward technology-based research tools. If they find these tools useful for tasks like data collection and analysis and perceive them as easy to use, their willingness to adopt them increases [2].

Additionally, external variables such as facilitating conditions (resources, technical support), social influence (peer and faculty recommendations), and individual differences (prior experience, compatibility with existing practices) impact adoption. Perceived enjoyment (satisfaction from using technology) and subjective norm (social expectations) also influence attitudes toward technology use [3].

Nevertheless, a study by Egbe on the attitude of students towards E-learning in South-West Nigerian universities: an application of Technology Acceptance Model, identified that there is no significant relationship between the ages of the students and their intention to use E-learning systems [4].

Similarly, the study by Oragbon that investigated the demographic characteristics in the attitude of postgraduate students towards the use of information resources in university libraries in South-South, Nigeria, revealed that there is a statistically significant difference between the age groups and their attitude towards information resources in university libraries in South-South Nigeria [5].

Musa et al. investigated the analysis of students' attitude towards the use of information and communication technology in Nigerian tertiary institutions; the study revealed that differences exist based on the school or institution, the attitude of the students varies from school to school [6].

Abdullahi and Nnajiofor investigated perception and attitudes towards manual and online catalogues among students in university libraries in North Central, Nigeria, and identified that differences exist in the attitude of students towards technology-based tools based on the different schools [7].

Postgraduate students' attitudes toward technology-based research tools are shaped by their beliefs, experiences, and external influences. Understanding these attitudes can help educators and policymakers design interventions to improve the adoption and effective utilization of these tools in academic research.

1.1. Hypotheses

Ho1: The mean scores of postgraduate students on their attitude towards research and data analysis does not significantly differ based on age.

Ho2: The mean scores of postgraduate students on their attitude towards research and data analysis does not significantly differ based on school.

2. Methodology

The analytic descriptive design was employed to identify the extent the attitude of the postgraduate students in Rivers State towards technology-based tools for research and data analysis differs based on age and school. The population at the time of this investigation consisted of postgraduate students from Ignatius Ajuru University (3,745), Rivers State University (3,900), and the University of Port Harcourt (4,038), totaling 11,683 postgraduate students. A sample of 400 postgraduate students was selected using proportionate stratified random sampling.

The sample was obtained from Government owned universities in Rivers State. The sample was determined using the Taro Yamen formula via the use of the calculator which was 387, but was rounded off to 400.

Data were collected via a questionnaire titled, Attitudes towards Technology-Based Research and Data Analysis Tools Questionnaire (ATBRDATQ). The instrument had two parts, part A and part B. Part A, elicited demographic information of Age and School of the respondents while, part B, which was made up of 10 items gathered information on the respondents attitudes towards technology-based research and data analysis tools. In addition, the response format for the instrument especially part B was on a four point scale of strongly agree (SA = 4), agree (A = 3), Disagree (D

= 2) and strongly disagree (SD = 1) for positively keyed items and reversed for negatively keyed items.

The instrument was validated by two experts in Measurement and Evaluation of the Department of Educational Psychology, Guidance and Counselling, Ignatius Ajuru University of Education Port Harcourt Rivers State. The instrument's reliability (α = .770) was established using Cronbach's Alpha formula (statistical tool) for a measure of its internal consistency. Furthermore, relevant data gathered from the respondents were subjected to mean and analysis of variance (ANOVA) statistical tools via SPSS version 21 to ascertain the mean for each group and possible mean significant difference among the groups.

3. Presentation of Results

Ho1: The mean scores of postgraduate students on their attitude towards research and data analysis does not significantly differ based on age.

Groups	N	Mean	SD
Below 25 yrs	2	44.50	0.71
26 - 30 yrs	15	50.00	6.50
31 - 35 yrs	136	44.45	4.62
36 - 40 yrs	23	44.39	4.93
41 - 45 yrs	142	43.68	5.48
Above 46 yrs	82	42.27	4.43

Sum of Variance	SS	df	Mean Square	F	Sig	Decision
Between Groups	830.363	5	166.073	6.663	0.000	Significant
Within Groups	9820.814	394	24.926			
Total	10651.178	399				

Table 1: One-way ANOVA of the Mean Scores of Postgraduate Students on Their Attitude Towards Research and Data Analysis Based on Age

The One-way Analysis of Variance was applied to test the null hypothesis that the mean score of postgraduate students on their attitude towards research and data analysis does not significantly differ based on age. The independent variables include 6 groups: Below 25 years (44.50, 0.71) N=2, 26 - 30 years (50.00, 6.50) N=15, 31 - 35 years (44.45, 4.62) N=136, 36 - 40 years (44.39, 4.93) N=23, 41 - 45 years (43.68, 5.48) N=142, above 46 years (42.27, 4.43) N=82. The ANOVA was significant at P = 0.00, hence the null hypothesis was rejected and concluded that the mean scores of postgraduate students on their attitude towards research and data analysis significantly differ based on age.

Groups _ AGE		Mean Difference	Sig.	Decision
Below 25	26 - 30	-5.5	0.829	Not sig
	31 - 35	0.051	1	Not sig
	36 - 40	0.109	1	Not sig
	41 - 45	0.824	1	Not sig
	Above 46	2.232	0.996	Not sig
26 - 30	31 - 35	5.551*	0.006	Sig
	36 - 40	5.609*	0.045	Sig
	41 - 45	6.324*	0.001	Sig
	42 - 45	7.732*	0	Sig
31 - 35	43 - 45	0.057	1	Not sig
	44 - 45	0.772	0.893	Not sig
	45 - 45	2.18	0.085	Not sig
36 - 40	46 - 45	-0.057	1	Not sig
	47 - 45	0.715	0.995	Not sig
	48 - 45	2.123	0.662	Not sig

41 - 45	49 - 45	1.408	0.531	Not sig
Above 46	50 - 45	-1.408	0.531	Not sig

Table 2: Post Hoc Test Analysis on the Comparison of the Groups

A Post Hoc comparison was conducted to identify pairwise differences among the groups with Scheffe. The test revealed significant pairwise differences between the mean scores of 26 - 30 years and 31 - 35 years, 26 - 30 years and 36 - 40 years, 26 - 30 years and 41 - 45 years, and 26 - 30 years and above 46 years (P < 0.05).

Ho2: The mean scores of postgraduate students on their attitude towards research and data analysis does not significantly differ based on school.

Groups	N	Mean	SD
IAUE	128	43.30	4.44
RSU	132	42.73	3.68
UNIPORT	140	45.64	6.42

Sum of Variance	SS	df	Mean Square	F	Sig	Decision
Between Groups	650.596	2	325.298	9.21	0.00	Significant
Within Groups	10000.58	397	25.19			
Total	10651.18	399				

Table 3: One-way ANOVA of the Mean Score of Postgraduate Students on Their Attitude Towards Research and Data Analysis Based on School

The One-way Analysis of Variance was conducted to test the second hypothesis which stated that the mean scores of postgraduate students on their attitude towards research and data analysis does not significantly differ based on school. The independent variables include 3 groups: IAUE (43.3, 4.441); N=128, RSU (42.73, 3.678); N=132, and UNIPORT (45.64, 6.417); N=140. The ANOVA was significant at P = 0.000, hence the null hypothesis was rejected and concluded that there is a significant difference in the attitude of the postgraduates towards technology-based tools for research and data analysis based on school.

Groups_School		Mean difference	Sig	Decision
IAUE	RSU	0.562	0.666	Not significant
	UNIPORT	-2.346*	0.001	Significant
RSU	UNIPORT	-2.908*	0	Significant

Table 4: Post Hoc Test Analysis on the Comparison of the Groups

Post Hoc comparison was conducted to identify pairwise differences among the groups, with Scheffe. The test revealed significant pairwise differences between the mean scores of IAUE and UNIPORT, and RSU and UNIPORT (P < 0.05).

4. Discussion of the Findings

The attitude of postgraduates towards technology-based tools differs based on age. That is attitude varies by age. Table 1 shows that students below 31 years have a positive attitude towards all tools, students 31-45 years have a negative attitude towards some tools (DupliChecker, EBSCO, Grammarly, Sage), and students above 46 years have a negative attitude towards more tools (Taylor & Francis, DupliChecker, Grammarly, Sage, EBSCO). The researchers carefully studied attitude of each group towards technology-based tools for research and data analysis. The study by Egbe on the attitude of students towards E-learning in South-West Nigerian universities: an application of Technology Acceptance Model, identified that there is no significant relationship between the ages of the students and their intention to use E-learning systems [4].

The study by Oragbon that investigated the demographic characteristics in the attitude of postgraduate students towards the use of information resources in university libraries in South-South, Nigeria, revealed that there is a statistically significant difference between the age groups and their attitude towards information resources in university libraries in South-South Nigeria [5]. The significance lies in ages 21 – 25 years and 41 years and above. The age of student may have influence on the attitude towards technology-based tools for research and data because the older

students may not be flexible enough to adapt to trends in the world and the field of education, especially in relation to technology. This can impact the attitude of the students towards innovative online tools for research and data analysis.

The three universities in Table 3 have students with a positive attitude (mean scores above 2.88), but there is a significant difference between schools. The significant difference may have been influenced by the school environment, as the findings indicate that there is a significant difference among groups. Musa et al. investigated the analysis of students' attitude towards the use of information and communication technology in Nigerian tertiary institutions; the study revealed that differences exist based on the school or institution, the attitude of the students varies from school to school [6]. So, the school likely has an influence over students' attitude towards ICT, according to the study. Abdullahi and Nnajiofor investigated perception and attitudes towards manual and online catalogues among students in university libraries in North Central, Nigeria, and identified that differences exist in the attitude of students technology-based tools in the different schools [7].

However, these studies provide insightful information about students' attitudes towards technology-based tools for research and data analysis, but also show how complex these problems are and how much research with larger and more varied sample sizes is required to improve generalizability and broaden understanding. Furthermore, because technology is developing so quickly, it is crucial to always monitor the changes over time that occurs in students' attitude towards technology-based tools for research and data analysis. The tools that are commonly used include Google Scholar, Academia.Edu, Google Forms, Research Gate, Microsoft PowerPoint, PubMed, Microsoft Excel. Tools not commonly used included EBSCO, Taylor & Francis, Grammarly, DupliChecker (for some age groups). Tools with the most positive attitude scores are Google Scholar, Google Forms, Academia.Edu, Research Gate, Microsoft PowerPoint, PubMed, Microsoft Excel. Tools with the most negative attitude scores are DupliChecker, Grammarly, EBSCO, Sage (for some age groups).

5. Conclusion

Postgraduates' attitudes towards technology-based research tools significantly vary based on age and school. The younger students demonstrated greater enthusiasm for digital tools, while older students exhibited comparatively lower adoption rates. Additionally, variations among institutions suggest that access to resources and institutional support play a crucial role in shaping students' attitudes.

5.1. Recommendations

From the findings the following recommendations were made:

i.Tailored approaches should be adopted to address the varying attitudes towards technology-based tools among different age groups. Through workshops for older students, their knowledge will not just increase but their attitude will be influenced for good.

ii.Mentorship programmer or peer support groups can help older postgraduates as well to cope with the trend in technology.

iii.Since there are significant differences in attitude based on school, it is recommended for institutions to conduct surveys or focus groups to better understand the factors influencing the attitude of the students towards technology-based tools for research and data analysis. Based on the findings, targeted interventions or initiatives can be implemented to address any negative attitudes and promote a more positive perception of technology-based tools for research and data analysis.

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