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PREDICTIVE MODELLING OF DATA ACCESSIBILITY AND RESEARCH ATTITUDE OF POSTGRADUATE STUDENTS IN SOUTH-SOUTH, NIGERIA

***[1]Jacob Esu Odiong; [2]Udemba, Esther Chinenye; [3]Judith Tano Ari; [4]Ekpoto, David Francis; [3]Valentine Joseph Owan & [6]Delight Omoji Idika.**

jacobesu@gmail.com, esther.udemba123@gmail.com, juditharitano@gmail.com,

ekpotodavid@gmail.com, owanvalentine@gmail.com.

delightoidika@unical.edu.ng

[1]Department of Economics, Arthur Jarvis University, Akpabuyo, Cross River State, Nigeria.
[2]Department of Educational Management and Business Studies, Federal University Oye -Ekiti.
[3]Department of Educational Foundations. University of Calabar, Cross River State, Nigeria
[4]Department of Geography & Sustainable Development Studies Education, University of Calabar, Calabar - Nigeria
[6]Institute of Education, University of Calabar, Calabar, Nigeria.

Abstract

Limited access to research data continues to pose a serious challenge to researchers in developing countries. This study used the predictive modelling approach to investigate the relationship between research data accessibility and the research attitude of postgraduate students in South-South Nigeria. A correlational survey design was adopted for the study. A sample of 520 postgraduate education students participated in the survey from a population of 1,299 students who enrolled for master's and Doctorate degrees in Federal Universities. The purposive, proportionate stratified random sampling and the accidental sampling techniques were adopted. Two close-ended questionnaires titled: "Research Data Accessibility Questionnaire" (RDAQ) and "Postgraduate Students' Research Attitude Questionnaire" (POSRAQ), both designed by the researchers with eight items each, were used for data collection. The Kuder-Richardson 20 (K-R20) reliability coefficients, which ranged between 0.79 and 0.82, indicate the instrument's high degree of internal consistency. The binary data was further dummy coded. The one-sample t-test and the simple linear regression analysis showed that the research attitude of students is significantly positive and that there is a significant positive prediction of research data accessibility on the research attitude of the students. The conclusion reached was that greater research data accessibility could stimulate a more positive research attitude. A need arose for the personnel who manage research data in relevant institutions to provide unrestricted access to sustain a positive research attitude.

Keywords: Predictive analysis, Data access, Research behaviour, graduate researchers, research engagement

Introduction

Research plays a leading role in shaping the world today as it provides a better insight into the most pressing issues. Inventions, innovations and advancement in science, technology, medicine, education, social sciences, arts and humanities, to mention but a few, are traceable to conscientious commitment to research made by man in their unending quest for success, search for meaning and lifelong answers to bugging questions about varied issues of life

(Odiong, 2021; Saini, Kumar & Kaur, 2020; Ekpoto, Bassey & Odiong, 2020). Given this, researching issues of immense interest and contribution to national development has become a mandatory requirement for the award of degrees at undergraduate and postgraduate schools across tertiary educational institutions in Nigeria and the world. Implicit in this laudable initiative is the capacity to steer the nation toward irrecoverable national development (Odiong, 2015). As a preparatory measure, research methods courses are mandatory for all students during coursework to keep them well-equipped for the journey ahead. However, the attitude exhibited by some postgraduate students in research appears to be deplorably poor. Postgraduate education, which epitomises research as the hallmark of scholarship, requires a high sense of independence, initiative, creativity, resilience and a dynamic disposition to problem-solving (Odiong, 2021). As potential human resources in the nation's research enterprises, postgraduate students ought to be shining examples of excellence in knowledge creation in a knowledge-based economy. Sadly, the research attitude of these students leaves much to be desired and therefore calls to question the credibility of the universities as the vehicle for dependable human resource development. Today, boycotting the personal conduct of research and engaging the services of "research mercenaries" in writing theses and dissertations on behalf of some students have become commonplace. A few others who attempt to "take the bull by the horns' sometimes resort to data falsification and related research misconduct for apparent reasons. These culminate in producing research work that draws unreliable and misleading conclusions.

Conceptually, "research is the quest for knowledge obtained through systematic study and thinking, observation and experimentation" (All European Academies, ALLEA, 2017, p.3). As must be acknowledged, research, a scientific discipline, is a demanding endeavour (Ubi & Odiong, 2017). "As a scientific discipline, the successful and effective conduct of research demands scientific attitude, such as inquisitiveness, enthusiasm, perseverance, resilience and more" (Odiong, Thomas and Nyong, 2020, p.132). "Research attitude is an individual's positive or negative disposition towards research practice. A positive or negative disposition a person exhibits towards an entity is an important indicator of a person's attitude towards that entity, individual or activity" (Ubi & Odiong, 2021, p.35). Attitude "refers to a learned predisposition or tendency on the part of an individual to respond positively or negatively to some object, situation, concept or another person" (Sarmah & Puri, 2014, p.6). "As a psychological construct, attitude is an essential factor in students' educational preparation in general and progress in research activity in particular" (Ubi & Odiong, 2021, p.36). As Hussain, Qayyum, Akhter, Abid, and Sabir (2016) observe, "a positive attitude towards research is a key to success and progress in knowledge-based societies" (p.113). Similarly, Siddiqui and Ahmad (2015) observe that knowledge obtained through research is the best as it is not founded on assumptions or untested generalisations. They cautioned that the right attitude, truthful observation and integrity are required to seek such knowledge. Accordingly, a willingness to invest quality time in collecting and studying all forms of evidence before concluding is essential (p.197).

Globally, researchers have made efforts to investigate research attitudes. Butt and Shams (2013) explored student teachers' attitudes towards research and reported that the student teachers had negative attitudes towards research. In Nigeria, Okafor, Anachunam and Ngozi (2024) explored the attitude of postgraduate students towards thesis writing at Nnamdi Azikiwe University, Awka, and reported that postgraduate students have a positive attitude towards thesis writing. Studies on research attitude have revealed that a number of factors shape research attitude. Memarpour, Fard, and Ghasemi (2015) evaluated attitude, knowledge, and barriers to research using Shiraz students in medical science and found that undergraduates showed a more positive attitude than postgraduates. Inadequate funding and time were identified among the main barriers students encountered. Similarly, Jahan, Maqbali,

Siddiqui and Zadjali (2015) investigated attitudes and barriers to research using Healthcare Professionals and reported that a more significant proportion of the respondents did not participate in research activities due to lack of research training, time, and financing. Furthermore, Siamian, Mahmoudi, Habibi, Latifi and Zare-Gavgani (2016) explored Students' attitudes to research at Mazandaran University of Medical Sciences and found that the Undergraduates had a positive attitude. Still, their strong interest was seriously challenged by the absence of research facilities. Turk, Al Saadi, Alkhatib, Hanafi, Alahdab, Firwana, Koudsi and Al-Moujahed (2018) assessed medical students at the University of Damascus, Syria, and reported that most of them demonstrated positive attitudes toward research. However, a lack of research training was identified as a key barrier.

Amin, Kaliyadan, Al Qattan, Al Majed, Al Khanjaf, and Mirza (2012) assessed knowledge, attitudes and barriers related to the participation of medical students in research in three Arab Universities. The result indicated that most students had a moderately positive attitude towards scientific research**.** Furthermore, Manuel, Fenton, and Philemon (2013) studied university Undergraduate sociology and psychology students' attitudes towards research. The findings revealed that more psychology than sociology students had positive attitudes and seemed more interested in studying the discipline.

Existing studies on research attitude have paid attention to other variables and outrightly neglected the impact of research data accessibility on research attitude. The United States (US) Department of Energy (2024) defined research data as "the recorded factual material commonly accepted in the scientific community as necessary to validate research findings". Accordingly, this excludes "preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues." The US Department of Energy (2024) further identified details that are not regarded as research data to consist of materials that are protected by law or should be kept confidential by an investigator until they are published, tangible substances like laboratory samples, commercial information, trade-secrets, personnel statistics, medical data and other particulars that if disclosed translate to an unnecessary invasion of a person's privacy, such as details that could facilitate the identification of a specific individual in a study. Data accessibility refers to "the ease of access to research data by the public for use in research, planning and decision making" (Odiong, 2021, p.111). The term research data accessibility is synonymous with data sharing. According to the US Department of Energy (2024), "data sharing means making data available to people other than those who have generated them". Accordingly, "examples of data sharing range from bilateral communications with colleagues to providing free, unrestricted access to the public through, for example, a web-based platform".

The effective management of research data is essential for advancing research enterprises as it dictates the degree of research data accessibility and research participation across the globe (Melero & Navarro-Molina, 2020; Tenopir, Christian, Allard, & Borycz, 2018). Research data accessibility is the foundation of the development of science. As a scientific enterprise, research thrives in the face of open access to data (Ubi & Odiong, 2021; Owan & Bassey, 2019). Openness is the basis upon which transparency, replicability, verifiability and discoverability can be guaranteed in science (Melero et al, 2020; Tenopir, et al, 2018; Bierer, Crosas, & Pierce, 2017; Van den Eynden, Knight, Vlad, Radler, Tenopir, Leon, Manista, Whitworth & Corti, 2016; Aleixandre-Benavent, Moreno-Solano, Ferrer-Sapena *&* Perez, 2016*;* Kim & Zhang, 2015). Research data management largely provides the foundation upon which the direction, scope, smooth take-off, pace and integrity of research activity are defined or based (Varnai, Rentel, Simmonds, Sharp, Mostert and deJongh, 2014). Ubi and Odiong (2021) observe that "researchers need ready access to a wide range of data that can promote the smooth conduct of their research" (p.37). The ease of access to data by authorised users and researchers enables them to be sufficiently informed about the size and

magnitude of the data (Odiong, 2021). This, in turn, promotes sampling adequacy, reduces statistical bias, fast-tracks the research progress and sets the atmosphere for research integrity and research quality assurance to materialise. In line with this, Varnai, Rentel, Simmonds, Sharp, Mostert and deJongh (2014) posited that enhanced access to data not only allows for more transparency in clinical research but can also drive the generation of knowledge and allows researchers to tackle new research questions, reduce duplication and optimise the design of trials, or increase the efficiency of the research process by linking data from multiple trials. Likewise, "access to high-quality data is essential to advancing science and indispensable in improving human conditions" (American Statistical Association, 2008, cited by Ubi & Odiong, 2021, p.37). Accordingly, "robust new data sources on human behaviour allow researchers to ask and answer complex questions and hence guide policy decisions, and sophisticated electronic technologies have facilitated ready access of these data to the public".

Scholars have observed that in developed countries, development in science and technology serves to reduce the barriers to data accessibility to the barest minimum (Owan, Ogar, Nwosu, Agama, Verma & Nwoke, 2023; Odigwe, Bassey & Owan, 2020). However, limited access to research data continues to pose a serious challenge to researchers in developing countries, particularly Nigeria. Often, the data researchers require are either non-existent, available for a fee, inaccessible or declined (International Organization for Migration, IOM, 2014; Woolfrey, 2014; National Academy of Sciences, 2009). Faced with this hurdle, most researchers resort to exhibiting a negative attitude towards research, including falsifying data or indulging in other practices that undermine the credibility of the research outcome. Worse, some researchers have abandoned their vibrant ideas and promising research projects due to limited access to available data. Others tend to get discouraged from conducting certain studies, diverting their attention to pursue other areas of less interest because they cannot access secondary sources for data.

Researchers and applied scientists have tried to unravel the impediments to data accessibility. Attempts to identify the immediate and remote causes of limited access to data in developing countries have led to various positions and findings. Some scholars have attributed it to policies bordering on research data management being nonexistent nationally and institutionally in such countries (Rafiq & Ameen, 2022; Melero & Navarro-Molina, 2020). A study of 13 countries in sub-Saharan Africa identified the research environment as a key barrier to data accessibility, noting that the research environment in the developing countries vary distinctly from those of the developed countries in terms of "resource provision, research support and extra-laboratory infrastructures (power, Internet and so forth)" (Bezuidenhout & Chakauya, 2018, p.40). A study by Melero et al. (2020) identified poor knowledge of data management as a prominent barrier to access to data or data sharing.

In a study of data collection challenges, Rimando, Brace, Namageyo-Funa, Parr, Sealy, Davis, Martinez and Christiana (2015) examined seven doctoral graduates of a public health programme at a South-Eastern United States urban university using mixed methods as well as interviews and focus groups. The finding showed that the respondents encountered challenges with data collection. Therefore, it was recommended that improved access to data should be provided as ease of access motivates the researchers and enhances the research progress and product.

Similarly, Varnai, Rentel, Simmonds, Sharp, Mostert and deJongh (2014) carried out a study to assess the research potential of access to clinical trial data. The survey result showed that most respondents believed accessibility to participants' data influences the research direction. The study further specified that 66% of the participants affirmed that one of the most significant barriers to research was current access to extant datasets. Hence, 71 per cent of the survey respondents expressed the need for a future data-sharing model to allow access to datasets. Furthermore, Oware (2010), in a study of postgraduate students'

views and experiences of information literacy, found that promoting open source resources increases access to useful data and motivates individuals to deal with the information as restrictions of access to databases constitute a significant difficulty in research.

The need to examine the relationship between research data accessibility and the research attitude of postgraduate students cannot be overemphasised. Difficulties in accessing data are capable of negatively shaping attitudes towards research. In turn, this negative research attitude has implications for research utilisation by stakeholders and policy-makers of a nation. As Odiong and Nkebem (2018) observe, "the extent to which a research finding is utilised reveals the level of trust reposed on the research process, and this is, by extension, determined largely by the availability of substantial and comprehensive evidence that the research process from which the finding emerged complied with universal standard" (p.205).

Empirical studies on postgraduate students' attitudes towards research are scarce in Nigeria, and studies on research data accessibility are scarce. Many studies on attitudes towards research were conducted outside the current study area. A number of these studies were not indigenous and also involved participants from the field of medical sciences. Most of the studies also focused on undergraduate students despite the fact that postgraduate students are the future of the research enterprise. Besides, studies that examined research data accessibility as a predictor of postgraduate students' research attitudes are non-existent. Most studies on postgraduate students' attitudes towards research examined other correlates of research attitude rather than research data accessibility. It is these gaps that this present study seeks to address. This study, therefore, involves a predictive modelling of research data accessibility and research attitude of postgraduate students in South-South, Nigeria.

Hypotheses

The research was set to test the following null hypotheses:

H_{01}: The research attitude of postgraduate students in South-South Nigeria is not significantly positive.

H_{02}: There are no significant predictive effects of research data accessibility on the research attitude of postgraduate students in South-South Nigeria.

Methodology

A correlational survey design was adopted for this study. Isangedighi, Joshua, Asim, and Ekuri (2004) defined correlational research design as a design that attempts to find the nature of the relationship between a set of variables. Accordingly, the variables and the relationship between them cannot be manipulated. The target population of the study was comprised of postgraduate students in Nigeria. The sample of 520 education postgraduate students, representing 40 per cent of the population, was drawn from the accessible population of 1,299 students who enrolled for Masters and Doctorate degrees across all the Federal Universities in South-South, Nigeria. This sample met the minimum required for effective generalisation as Yamane (1967) proposed that for the population size involved in this study, 23.5 per cent of the population is the minimum sample size. The choice of this population was informed by the observation that most studies on research attitude revolved around participants in Biomedical and Clinical sciences, public health, humanities and social sciences. There was a need to study research attitudes in the education faculty to bridge the gap. The purposive, proportionate stratified random sampling and the accidental sampling techniques were adopted. Two close-ended questionnaires on a two-point scale of "Yes" (1) or "No" (0) were employed for data collection. For the purpose of confidentiality and anonymity, the identity of the respondents was not captured on the questionnaire. The first instrument was titled: "Research Data Accessibility Questionnaire" (RDAQ), while the second instrument was titled: "Postgraduate Students' Research Attitude Questionnaire" (POSRAQ). The

instruments, which the researchers designed, contained 8 items each. The closed-ended questionnaire was chosen because of its uniqueness in ensuring more excellent uniformity and objectivity of responses, as well as easier quantification of data. The questionnaire draft was subjected to face and content validity by educational psychology experts and Research, Measurement and Evaluation experts. After vetting, their suggestions were incorporated before administration for data collection. A trial test involving 50 respondents who were not part of the significant study population was conducted by the researcher at the Cross River University of Technology (CRUTECH). The Kuder-Richardson 20 (K-R20) reliability method yielded reliability coefficients which ranged between 0.79 and 0.82 and were considered high enough for the researcher to conclude that the instrument is a reliable tool for measuring the traits or variables covered in the study. The binary data was further subjected to dummy coding during the data analysis. One-sample t-test and simple linear regression statistical tools were used to test the hypotheses.

Model specification

Simple Linear regression (SLR) is a statistical tool that predicts the value of a continuous outcome variable based on a single predictor variable. Hence, the empirical model for this study was specified functionally as follows:

$RA = f(RDA)$

The model above was written in a linear form as:

$RA = \beta o + \beta_1(RDA) + e.$

Where:

RA = Research Attitude

RDA = Research Data Accessibility.

βo = constant or regression intercept.

β_1 = the regression slope

e = the disturbance or error term

The Aprior Expectation

Given that the dependent and independent variables are expected to change in the same direction, the a prior expectation was stated thus: $\beta_1 > 0$.

Results

Hypothesis one

The research attitude of postgraduate students in South-South Nigeria is not significantly positive. The one-sample t-test analysis via IBM SPSS (version 23) gave rise to the result in Table 1.

Table 1: One sample t-test analysis of the research attitude of postgraduate students in South-South, Nigeria (n = 520)

Variable	$\bar{X}$	μ	SD	t-value	p-value
Research attitude of postgraduate students	4.59	4.00	1.619	8.29*	.000

*P < .05, df = 519; Std. Error Mean = 0.071

Table 1 shows that the t-value (8.29), representing the observed research attitude of postgraduate students in the study area, is significant ($p = 0.000 < 0.05$; df = 519). On this basis, the null hypothesis was rejected, while the alternative hypothesis was accepted, implying that postgraduate students' research attitudes in South-South Nigeria are significantly positive. A further implication of this result is that the positive attitude towards

research is significantly high, as revealed by the magnitude of the p-value. This indicates that many postgraduate students are favourably disposed towards research.

Hypothesis two

There is no significant predictive effects of research data accessibility on the research attitude of postgraduate students in South-South Nigeria. The predictor variable in this hypothesis was research data accessibility while the criterion variable was research attitude of postgraduate students, as shown in Table 2.

Table 2: Simple linear regression analysis of the predictive effects of research data accessibility on research attitude of postgraduate students in South-South, Nigeria (n=519)

Model summary					
R	R Square	Adjusted R Square		Std. Error of the Estimate	
0.326[a]	0.106	0.105		1.532	
Analysis of variance (ANOVA)					
Sources of variation	Sum of Squares	Df	Mean Square	F-value	p-value
Regression	144.725	1	144.725	61.691*	.000[b]
Residual	1215.205	518	2.346		
Total	1359.931	519			
Coefficients					
	Unstandardised Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p-value
(Constant)	2.942	.220		13.360	.000
RDA	.301	.038	.326	7.854*	.000

*Significant (p<.05).

a. Dependent Variable: Research Attitude (RA).

b. Predictors: (Constant), Research Data Accessibility (RDA).

Table 2 shows that the F-value is statistically significant ($F = 61.691_{(1, 518)}$; $p< 0.05$). This result indicated that research data accessibility has a significant predictive effect on the research attitude of postgraduate students in South-South, Nigeria.

Table 2 also indicates the correlation coefficient ($R = 0.326$) and the explained variance or R-square ($R^2 = 0.106$) associated with the predictor variable. The model R-square indicates that 10.6% of the total variations in the research attitude of postgraduate students around its mean is explained by variations in the research data accessibility in the model. Hence, the null hypothesis was rejected. This means there is a significant predictive effect of research data accessibility on the research attitude of postgraduate students. A further implication of this result is that the greater the research data accessibility, the more positive the research attitude of postgraduate students, and vice versa. This finding is in consonance with a prior expectation. Hence, the standardised least square prediction equation or model was presented as follows:

RA = 2.942+0.326RDA

The simple linear regression model above shows that the research attitude of postgraduate students is a function of research data accessibility (RDA). The positive sign of the RDA coefficient indicates a positive or direct relationship between RDA and the research attitude of postgraduate students, such that a one standard deviation increase in RDA from its mean will lead to an increase in the research attitude of postgraduate students by 0.326 standard deviations from its own mean, and vice versa.

Discussion

The first finding of this study indicates that postgraduate students in South-South Nigeria generally exhibit a positive attitude towards research. This suggests they are willing and motivated to engage in research-related activities such as identifying problems, designing studies, analysing data, and disseminating findings. A positive attitude is an important factor contributing to completing research tasks and overall academic achievement. One reason for this finding could be the inclusion of research methodology courses in many postgraduate programmes. These courses may help students build the skills and confidence to approach research enthusiastically. Additionally, postgraduate students may view research as essential for their professional and academic growth, which could encourage them to develop a positive disposition towards it.

The support provided by universities may also contribute to this result. Some regional institutions offer mentorship, workshops, and access to research resources, which can positively shape students' attitudes. Peer interactions and encouragement from lecturers who value research may further influence students to approach research activities with interest and dedication. This finding suggests that postgraduate students in the region have the potential to contribute significantly to research efforts if provided with adequate support. Universities could take advantage of this positive attitude by offering more opportunities for funding, collaboration, and mentorship. By doing so, institutions can strengthen the research capacity of postgraduate students and foster contributions that address local and global challenges. This finding corroborates Amin et al. (2012) and Manuel et al. (2013), who reported from a related but separate study that the participants had a positive attitude towards research.

The second finding indicates that research data accessibility significantly influences the research attitude of postgraduate students in South-South Nigeria. This suggests that the availability and ease of access to research data shapes how students perceive and approach research. When data is readily available, students are more likely to be enthusiastic and confident in carrying out their research activities. One explanation for this finding is that accessible data reduces the stress and challenges often associated with data collection. Students who can easily find relevant datasets can focus on other aspects of their research, such as analysis and interpretation, which can positively affect their attitude towards research. Additionally, access to digital libraries, research databases, and other sources of information may make the research process more manageable and less time-consuming for students.

Another possible reason is the role of technology and institutional support. Many institutions now provide digital platforms, online repositories, and guidance on accessing research data, which can help students feel better prepared to engage in research. Supervisors and faculty members facilitating access to data or directing students to useful sources may also contribute to this positive effect. This finding implies that improving access to research data is essential for fostering a positive research attitude among postgraduate students. Universities and research institutions should invest in providing accessible and reliable data platforms, expand digital library resources, and support open-access initiatives. Such efforts can help create an environment encouraging students to engage actively and productively in research activities. This finding corroborates the finding by Varnai et al. (2014) that accessibility to individual participant data from clinical trials influences the direction of research. Furthermore, the finding strengthens the finding by Oware (2010) that restrictions of access to databases constitute a significant difficulty in research.

Conclusion and Recommendations

This study investigated the factors influencing the research attitude of postgraduate students in South-South Nigeria. The findings show that postgraduate students in the region generally

have a positive attitude towards research. Furthermore, research data accessibility significantly influenced this attitude, indicating that the availability and ease of access to data is key in shaping how students perceive and engage with research activities. In conclusion, postgraduate students in South-South Nigeria are positively inclined towards research, and this attitude can be strengthened through improved access to data. This underscores the importance of creating an enabling environment where students can access the resources they need to conduct their research effectively. The findings are helpful for universities, policymakers, and research institutions aiming to enhance research engagement among postgraduate students. Addressing issues related to data accessibility could further improve research participation and output. Although this study focused on postgraduate students in South-South Nigeria, the findings could apply to similar academic contexts where data accessibility and institutional support influence students' research attitudes. Institutions in other regions with comparable challenges may benefit from implementing strategies to improve access to research data and support for postgraduate students. The following recommendations were made:

1. Universities and research institutions should enhance access to research data by providing well-equipped digital libraries, online repositories, and open-access resources. This will enable postgraduate students to quickly obtain the data needed for their research.
2. Academic programmes should incorporate training sessions to access and use research data effectively. These sessions could include practical workshops on navigating digital platforms and understanding available data sources.
3. Supervisors and faculty members should actively support postgraduate students in identifying relevant and reliable data sources. Overcoming challenges related to data access can encourage a more positive approach to research.

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