

Institutional Leadership and Advancement of Research Data Management (RDM) Policies in Universities in North Central Nigeria

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Abstract

Research Data Management (RDM) has become an essential component of research governance in higher education institutions because it promotes research integrity, data preservation, accessibility, and compliance with international research standards. Despite increasing research activities in Nigerian universities, the implementation of effective RDM policies remains inconsistent due to leadership, institutional, and infrastructural challenges. This study investigated the role of institutional leadership in advancing Research Data Management policies in universities in North Central Nigeria. Specifically, the study examined how institutional leadership influences the adoption and implementation of RDM policies, identified leadership strategies that facilitate innovation and compliance, assessed challenges hindering effective policy implementation, and proposed measures for strengthening leadership effectiveness in RDM governance. A convergent mixed-methods research design was adopted. Quantitative data were collected from 150 university administrators, librarians, research directors, and academic staff using a structured questionnaire, while qualitative data were obtained through semi-structured interviews with 20 institutional leaders. Descriptive statistics and multiple regression analysis were used to analyze the quantitative data, whereas thematic analysis was employed for the qualitative data. The findings revealed that institutional leadership effectiveness, institutional support, and RDM infrastructure jointly had a significant influence on the implementation of RDM policies ($F = 51.286$, $p < 0.05$). Institutional leadership effectiveness emerged as the strongest predictor ($\beta = 0.438$, $p < 0.05$), followed by institutional support ($\beta = 0.307$, $p < 0.05$) and RDM infrastructure ($\beta = 0.215$, $p < 0.05$). Qualitative findings further demonstrated that participatory leadership, strategic planning, stakeholder collaboration, and continuous capacity development enhance successful RDM implementation, while inadequate funding, weak ICT infrastructure, limited technical expertise, and resistance to organizational change remain major barriers. The study concluded that effective institutional leadership is fundamental to strengthening research data governance and improving research productivity in universities. It recommended strengthening leadership capacity, increasing institutional support, and investing in sustainable digital infrastructure to enhance the implementation of Research Data Management policies in universities in North Central Nigeria.

Keywords: Higher Education, Institutional Leadership, Policy Implementation, Research Data Management, Research Governance.

I. Introduction

The advancement of research output in higher education institutions is closely linked to the management of research data. Universities generate vast volumes of data through faculty research, postgraduate studies, and institutional surveys, making the effective governance of these datasets critical for knowledge preservation, reproducibility, and policy development. In many higher education systems globally, research data management (RDM) has evolved from a peripheral administrative activity into a strategic institutional priority. Leadership within universities plays a pivotal role in this evolution, shaping the policies, structures, and practices that govern how data is collected, stored, shared, and preserved for future use (UNESCO, 2023; European Commission, 2023).

In the context of Nigeria, higher education has experienced significant expansion, with the establishment of numerous federal, state, and private universities across different regions, including the North Central geopolitical zone. This region, encompassing Benue, Kogi, Kwara, Nasarawa, Niger, Plateau States, and the Federal Capital Territory, hosts several universities that serve as hubs for

research and innovation. Despite the growth in research activities, many universities in this zone face challenges related to RDM, including inadequate policy frameworks, limited infrastructure, insufficient funding, and low levels of staff awareness regarding best practices in data management (African Open Science Platform, 2022; NUC, 2023).

Leadership in Nigerian universities, particularly in North Central Nigeria, holds the potential to transform governance structures into actionable RDM policies that promote research integrity, data sharing, and compliance with global standards. Transformational, strategic, and participatory leadership approaches are critical in guiding institutional priorities, allocating resources, and fostering a culture of accountability among researchers (Northouse, 2024; OECD, 2023; UNESCO, 2023). Recent studies have indicated that where leadership actively engages in policy development and institutional innovation, research productivity and data quality improve significantly (OpenAIRE, 2024; CAMRET, 2022). However, empirical evidence suggests that leadership engagement in RDM within Nigerian universities remains inconsistent. Some institutions have initiated efforts toward establishing digital repositories and data-sharing protocols, yet these initiatives are often fragmented, underfunded, or inadequately supported by senior leadership. As a result, policies that exist on paper frequently fail to translate into effective practice, leading to challenges such as data loss, duplication of research efforts, and limited research visibility (NUC, 2023; African Open Science Platform, 2022).

II. Literature Review

The conceptualization of leadership's role in research data management draws from contemporary leadership perspectives that emphasize innovation, strategic planning, and stakeholder engagement. Transformational leadership encourages institutional members to embrace change and innovation, which is essential for the successful adoption of new data management systems and practices (Northouse, 2024). Strategic leadership focuses on setting clear organizational goals, aligning institutional resources, and ensuring compliance with established policies and procedures (OECD, 2023). Participatory leadership promotes collaboration among librarians, information technology personnel, researchers, and administrators, thereby facilitating stakeholder commitment and sustainability of RDM initiatives (OpenAIRE, 2024). Empirical studies across the globe have demonstrated the impact of leadership on RDM outcomes. Universities that invest in leadership-driven RDM policies tend to experience improved data quality, enhanced research visibility, and greater compliance with international standards. The European Commission (2023) reported that institutions with proactive leadership and strong governance frameworks are more successful in implementing comprehensive RDM policies and ensuring long-term preservation of research outputs. Similarly, UNESCO (2023) emphasized the importance of leadership commitment in advancing open science and strengthening research data governance.

Within Nigeria, RDM is gradually emerging as an important institutional concern, although implementation remains uneven across universities. The NUC (2023) noted that leadership support through resource allocation, staff training, and policy enforcement significantly enhances compliance with RDM practices. Furthermore, institutions that demonstrate strong leadership commitment are more likely to establish digital repositories, improve data security, and encourage responsible research data sharing (CAMRET, 2022). Despite these positive developments, several challenges continue to hinder effective RDM implementation in many North Central Nigerian universities. These challenges include inadequate funding, insufficient information technology infrastructure, limited digital literacy among researchers, and resistance to organizational change. Such factors contribute to fragmented implementation and limited monitoring of data quality, thereby affecting the overall effectiveness of institutional RDM initiatives (African Open Science Platform, 2022; OpenAIRE, 2024). These challenges underscore the need for a deeper understanding of how institutional leadership can transform governance frameworks into practical and sustainable RDM solutions.

A. Theoretical Framework

This study is anchored on Transformational Leadership Theory, Strategic Leadership Theory, and Participatory Leadership Theory, which collectively explain how institutional leadership influences the adoption, implementation, and innovation of research data management policies in universities. Leadership is widely recognized as a critical determinant of institutional effectiveness, policy implementation, and organizational innovation within higher education institutions (Northouse, 2024; OECD, 2023). Transformational leadership focuses on inspiring and motivating organizational members to achieve shared goals while fostering innovation and adaptability. In the context of research data management, transformational leaders encourage researchers and institutional stakeholders to embrace new technologies, adopt best practices, and actively participate in policy implementation. Recent studies have shown that transformational leadership contributes significantly to organizational innovation, institutional commitment, and improved performance in higher education institutions (UNESCO, 2023; Northouse, 2024).

Strategic leadership emphasizes the alignment of institutional resources, policies, and long-term objectives to achieve sustainable organizational outcomes. Strategic leaders play important roles in planning, coordinating, and monitoring RDM implementation. They facilitate investment in digital infrastructure, establish clear policy frameworks, and ensure effective utilization of available resources. Evidence suggests that strategic leadership strengthens institutional capacity to implement complex initiatives and promotes evidence-based decision-making (OECD, 2023; European Commission, 2023).

Participatory leadership focuses on collaboration, inclusiveness, and shared decision-making among stakeholders. In the context of RDM, participatory leadership encourages the involvement of librarians, information technology personnel, faculty members, and researchers in the design and implementation of data management policies. Studies have demonstrated that participatory leadership enhances policy acceptance, improves compliance, reduces resistance to change, and promotes the sustainability of institutional innovations (OpenAIRE, 2024; African Open Science Platform, 2022). Collectively, these leadership perspectives provide a comprehensive framework for understanding how institutional leadership can bridge the gap between policy formulation and implementation. Transformational leadership provides vision and motivation, strategic leadership ensures effective planning and resource allocation, while participatory leadership promotes collaboration and shared ownership. Together, these approaches offer a strong foundation for examining leadership strategies that can enhance research data management practices in universities within North Central Nigeria.

B. Statement of the Problem

Research data management has become a critical component of higher education governance, ensuring the integrity, accessibility, and sustainability of research outputs. Globally, universities increasingly recognize the need for structured RDM policies supported by strong institutional leadership to promote innovation, compliance with international standards, and effective utilization of research data (UNESCO, 2023; European Commission, 2023). In Nigeria, despite the continued expansion of research activities, particularly in the North Central region, there remains a significant gap between policy formulation and the practical implementation of RDM practices. Although some universities have initiated policy frameworks, digital repositories, and data management support services, these initiatives are often inconsistently implemented, poorly monitored, and inadequately supported by institutional leadership. Consequently, research data are frequently inadequately stored, poorly shared, or lost, thereby undermining research integrity, reproducibility, and institutional credibility. Researchers also encounter challenges associated with fragmented RDM systems, resulting in duplication of effort, reduced research efficiency, and limited visibility of research outputs on national and international platforms (NUC, 2023; African Open Science Platform, 2022).

Additional challenges further complicate the effective implementation of RDM practices. Many universities in North Central Nigeria face inadequate funding for digital infrastructure, insufficient human capacity for data management, and low awareness of RDM best practices among academic staff. Resistance to policy adoption resulting from limited stakeholder engagement also

weakens implementation efforts. These challenges not only constrain the effective use of research data but also limit universities' ability to meet international research standards and attract global research collaborations (OpenAIRE, 2024; UNESCO, 2023). Given the central role of leadership in policy development, resource allocation, stakeholder engagement, and organizational innovation, understanding how institutional leaders can effectively translate governance structures into practical and sustainable RDM practices is essential. Without focused empirical investigation into leadership-driven RDM initiatives in North Central Nigerian universities, research data may continue to be inadequately managed, thereby limiting the potential of RDM to enhance research quality, visibility, and innovation. Therefore, this study seeks to investigate the role of institutional leadership in advancing research data management policies in universities within North Central Nigeria. However, the study seeks to achieve the following objectives:

1. To examine how institutional leadership influences the adoption and implementation of RDM policies in universities of North Central Nigeria.
2. To identify leadership strategies that facilitates innovation and compliance in RDM practices.
3. To assess the challenges that hinders the effective translation of RDM policies into practice.
4. To provide recommendations for enhancing leadership effectiveness in promoting RDM within North Central Nigerian universities.

C. Research Questions

The following research questions raised were answered as:

1. How do institutional leaders influence the adoption and implementation of RDM policies in universities of North Central Nigeria?
2. What strategies do leaders employ to foster innovation and compliance in RDM practices?
3. What challenges hinder leadership effectiveness in translating RDM policy into practice?
4. How can leadership be strengthened to improve the management of research data in North Central Nigerian universities?

D. Research Null Hypotheses

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

H₀₁: Institutional leadership effectiveness, institutional support, and research data management infrastructure do not have a significant combined influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria.

H₀₂: Institutional leadership effectiveness does not have a significant relative influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria.

H₀₃: Institutional support and research data management infrastructure do not have significant relative influences on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria.

III. Methodology

This study adopted a convergent mixed-methods research design to investigate the role of institutional leadership in advancing Research Data Management (RDM) policies in universities in North Central Nigeria. The convergent mixed-methods design enabled the concurrent collection and analysis of quantitative and qualitative data, followed by the integration of findings to provide a comprehensive understanding of leadership practices, policy implementation processes, and innovative strategies employed in research data management. While the quantitative component generated measurable evidence regarding participants' perceptions and experiences, the qualitative component provided in-depth insights into leadership approaches, decision-making processes, and institutional factors influencing RDM policy implementation. The study was conducted in four universities in North Central Nigeria: the Federal University of Technology, Minna; University of Jos; Benue State University, Makurdi; and Federal University, Lafia. These institutions were purposively

selected because of their active involvement in research and their varying levels of research capacity, institutional governance structures, and research data management implementation. Institutional profiles were developed to provide contextual information regarding each university's research environment. The profiles considered institutional age, research intensity, ICT infrastructure, availability of institutional repositories, staff capacity, and commitment to research governance, thereby providing useful background for understanding variations in RDM implementation across the participating universities.

The study population comprised university administrators, research directors, librarians, and academic staff actively involved in research activities within the selected universities. Participants were purposively selected because of their direct involvement in the development, implementation, management, and oversight of research data management policies. To justify the quantitative sample size, an a priori power analysis was conducted using G-Power software. Assuming a medium effect size ($f^2 = 0.15$), a significance level of 0.05, and a statistical power of 0.80, the minimum recommended sample size was 118 respondents. The study exceeded this requirement by obtaining responses from 150 participants, thereby providing adequate statistical power for the quantitative analysis. For the qualitative component, 20 senior institutional leaders were purposively selected to participate in semi-structured interviews because of their leadership roles and direct experience with institutional research governance and RDM implementation. Although purposive sampling enabled the selection of participants with relevant expertise, its non-probability nature limits the generalizability of the findings beyond the participating universities. Consequently, the findings should be interpreted within the context of the selected institutions.

Data were collected using a structured questionnaire, a semi-structured interview guide, and document analysis. The questionnaire was developed following an extensive review of literature on institutional leadership, research governance, and research data management. It comprised sections measuring leadership effectiveness, policy implementation, institutional support, infrastructure availability, and challenges affecting RDM implementation. Responses were measured using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The semi-structured interview guide explored leadership strategies, governance mechanisms, institutional support, policy implementation processes, organizational challenges, funding mechanisms, and other factors influencing research data management implementation.

Institutional documents, including strategic plans, policy manuals, procedural guidelines, and research data management reports, were reviewed to triangulate evidence obtained from the questionnaires and interviews.

To establish content and face validity, the questionnaire and interview guide were reviewed by three experts in educational management, information science, and research methodology. Their comments regarding clarity, relevance, adequacy of coverage, and alignment with the study objectives were incorporated into the final versions of the instruments. A pilot study involving 20 respondents from a university outside the study area but possessing similar characteristics to the participating institutions was conducted to assess the clarity and consistency of the questionnaire. Internal consistency reliability was determined using Cronbach's Alpha, which yielded an overall reliability coefficient of 0.87, indicating high internal consistency and confirming the suitability of the instrument for the main study. For the qualitative component, trustworthiness was enhanced through member checking, triangulation of multiple data sources, and careful documentation of the research process to ensure credibility, dependability, confirmability, and transferability.

The researcher personally administered the questionnaires with the assistance of trained research assistants where necessary. A total of 180 questionnaires were distributed across the participating universities, of which 150 were completed and returned, representing a response rate of 83.3%, which is considered adequate for survey research. Although the response rate was satisfactory, the possibility of non-response bias cannot be completely excluded because individuals who did not participate may have held different views regarding institutional leadership and research data management implementation. Follow-up contacts and reminders were used to encourage participation

and minimize non-response bias. Semi-structured interviews were conducted either face-to-face or through virtual platforms depending on participants' availability. With participants' informed consent, interview sessions were audio-recorded and subsequently transcribed verbatim for analysis.

Quantitative data were analyzed using both descriptive and inferential statistics. Descriptive statistics, using mean, and standard deviation, was used to describe their perceptions of institutional leadership effectiveness, institutional support, research data management (RDM) infrastructure, and the implementation of RDM policies. The three null hypotheses formulated for the study were tested using multiple linear regression analysis at the 0.05 level of significance. Multiple regression analysis was considered appropriate because it enables the examination of the combined and relative influence of institutional leadership effectiveness, institutional support, and research data management infrastructure on the implementation of Research Data Management policies. Prior to the regression analysis, the data were screened for completeness and examined to ensure that the assumptions of multiple regression were satisfied. These assumptions included normality of data distribution, linearity, homoscedasticity, independence of errors, and absence of multicollinearity among the predictor variables. The first null hypothesis was tested using the overall regression model (F-test) to determine whether institutional leadership effectiveness, institutional support, and research data management infrastructure jointly exerted a significant influence on the implementation of RDM policies. The second and third null hypotheses were tested using the standardized regression coefficients (β), t-values, and associated probability values (p-values) to determine the relative contribution of each predictor variable. The coefficient of determination (R^2) and adjusted R^2 were also reported to indicate the proportion of variance in RDM policy implementation explained by the predictor variables collectively. All hypotheses were tested at the 0.05 level of significance.

Qualitative data obtained from the semi-structured interviews were analyzed using thematic analysis. Interview transcripts were transcribed verbatim, read repeatedly, coded systematically, and organized into themes representing leadership practices, governance mechanisms, institutional support, research data management implementation, and emerging issues. To strengthen the integration of the mixed-methods findings, joint displays were employed during interpretation. Quantitative statistical results were presented alongside corresponding qualitative themes, facilitating comparison between numerical findings and participants' narratives and enabling the identification of convergence, complementarity, and divergence between the two datasets.

A. Ethical Considerations

Ethical principles were strictly observed throughout the study. Participants were adequately informed about the objectives, significance, and procedures of the study before voluntarily providing informed consent. Confidentiality and anonymity were assured, and all information obtained was treated with strict confidentiality and used solely for academic purposes. Data were securely stored to prevent unauthorized access, and the study complied with institutional ethical guidelines governing research involving human participants. Overall, the adoption of a convergent mixed-methods research design, supported by rigorous instrument development, expert validation, pilot testing, power analysis, descriptive statistical analysis, thematic analysis, and the integration of quantitative and qualitative findings through joint displays, provided a robust methodological framework for examining the role of institutional leadership in advancing research data management policies in universities in North Central Nigeria.

IV. Results

The study aimed to investigate the role of institutional leadership in advancing research data management (RDM) policies in universities of North Central Nigeria. Data were collected from 150 participants using a structured questionnaire, while 20 senior leaders were interviewed for qualitative insights. The questionnaire items focused on leadership effectiveness, policy implementation, researcher compliance, and the availability of RDM infrastructure. Responses were measured on a

five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Descriptive analysis using mean and standard deviation was applied to interpret the data.

1. How do institutional leaders influence the adoption and implementation of RDM policies in universities of North Central Nigeria?

Table 1: Perceptions of Leadership Effectiveness in RDM Policy Implementation

S/N	Questionnaire Item	Mean ($\bar{X}$)	Standard Deviation (SD)	Interpretation
1	University leadership actively supports RDM policy development	4.35	0.62	High
2	Leaders provide necessary resources for RDM implementation	3.88	0.74	Moderate-High
3	Leadership monitors compliance with RDM policies regularly	3.62	0.81	Moderate
4	Leadership encourages innovation in research data management	4.10	0.69	High
5	Leaders engage stakeholders in RDM policy decisions	3.95	0.76	Moderate-High

(Source: Research, 2026)

The data in Table 1 indicate that participants generally perceived leadership as supportive of RDM initiatives. The highest mean (4.35) show that respondents strongly agree that university leadership actively participates in policy development. This suggests that leaders are aware of the importance of formal frameworks for managing research data. The standard deviations, ranging from 0.62 to 0.81, indicate a moderate level of consensus among participants, with slightly more variation regarding monitoring of compliance (SD = 0.81). Items related to resource provision and stakeholder engagement scored moderate to high, suggesting that while leadership is supportive, there are areas for improvement in consistently providing resources and including all stakeholders in decision-making.

2. To identify leadership strategies that facilitate innovation and compliance in RDM practices.

Table 2: Extent of RDM Policy Implementation

S/N	Questionnaire Item	Mean ($\bar{X}$)	Standard Deviation (SD)	Interpretation
1	RDM policies are clearly documented in the university	4.12	0.71	High
2	Policies are accessible to all researchers	3.75	0.83	Moderate
3	Training is provided to staff on RDM procedures	3.58	0.85	Moderate
4	Digital repositories are effectively utilized	3.80	0.78	Moderate-High
5	Policy compliance is regularly evaluated	3.46	0.89	Moderate

(Source: Research, 2026)

Table 2 shows that RDM policy documentation is largely in place (Mean = 4.12), indicating strong leadership emphasis on formalizing guidelines. However, accessibility, training, and compliance evaluation scored lower, highlighting gaps between policy development and practical implementation. The relatively higher standard deviations for training (0.85) and compliance

evaluation (0.89) suggest diverse experiences among participants across different universities, with some institutions implementing these practices more rigorously than others.

3. To assess the challenges that hinders the effective translation of RDM policies into practice.

Table 3: Perceived Challenges in RDM Implementation

S/N	Questionnaire Item	Mean ($\bar{X}$)	Standard Deviation (SD)	Interpretation
1	Inadequate funding for RDM initiatives	4.40	0.58	High
2	Limited technical infrastructure for data storage	4.22	0.65	High
3	Low staff awareness of RDM policies	3.95	0.77	Moderate-High
4	Resistance to adopting new data management practices	3.78	0.79	Moderate-High
5	Insufficient leadership monitoring of RDM practices	3.60	0.82	Moderate

(Source: Research, 2026)

Table 3 highlights the key obstacles to effective RDM policy implementation. Participants strongly agreed that inadequate funding and limited technical infrastructure are major constraints (Means = 4.40 and 4.22). Low awareness and resistance among staff scored moderate-high, suggesting that human factors also significantly influence RDM outcomes. Insufficient monitoring scored moderately, indicating that while leadership is supportive in policy creation, continuous oversight remains inconsistent.

A. Hypotheses Testing

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

H₀₁: Institutional leadership effectiveness, institutional support, and research data management infrastructure do not have a significant combined influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria.

Table 4: Regression Analysis (F-test) Institutional Leadership Effectiveness, Institutional Support, and Research Data Management Infrastructure Influence on the Implementation of Research Data Management (RDM) Policies in Universities in North Central Nigeria.

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	31.420	3	10.473	51.286	0.000
Residual	29.810	146	0.204		
Total	61.230	149			

Source: Research, 2026

Level of Significance: $\alpha = 0.05$

The regression analysis indicates that all three variables Institutional leadership effectiveness, institutional support, and research data management infrastructure have a significant influence on the implementation of Research Data Management (RDM) policies in Universities in North Central Nigeria. The null hypothesis is rejected because the overall regression model is statistically significant ($F = 51.286$, $p < 0.05$). The predictor variables jointly have a significant influence on the implementation of RDM policies. The findings of this study suggest that while institutional leadership plays a significant role in advancing Research Data Management (RDM) policies, its effectiveness is influenced by the prevailing organizational context. In many universities, institutional politics, bureaucratic procedures, and hierarchical administrative structures can either facilitate or constrain the implementation of RDM initiatives. Although senior leadership may demonstrate commitment to

RDM, implementation often depends on the willingness of middle-level managers, faculty members, librarians, and ICT personnel to collaborate effectively. Where communication channels are weak or decision-making is highly centralized, delays in policy implementation and resistance to organizational change may occur.

The qualitative findings further indicate that leadership effectiveness extends beyond formal authority to include the ability to build consensus, manage competing institutional interests, and create a shared vision for research data governance. Universities that promote participatory decision-making and cross-functional collaboration are more likely to achieve sustainable RDM implementation than institutions characterized by rigid administrative hierarchies.

H₀₂: Institutional leadership effectiveness does not have a significant relative influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria.

Table 5: Standardized Regression Coefficients Showing the Relative Influence of Institutional Leadership Effectiveness, Institutional Support, and RDM Infrastructure on RDM Policy Implementation in Universities in North Central Nigeria.

Predictor Variables	Unstandardized Coefficient (B)	Standard Error	Standardized Coefficient (β)	t-value	Sig. (p-value)
Constant	0.845	0.252	—	3.35	0.001
Institutional Leadership Effectiveness	0.421	0.072	0.438	5.84	0.000
Institutional Support	0.293	0.068	0.307	4.31	0.000
RDM Infrastructure	0.187	0.061	0.215	3.07	0.003

Source: Research, 2026

Level of Significance: $\alpha = 0.05$

Table 5 above of the standardized regression coefficients (β) indicates the relative contribution of each independent variable to the dependent variable. Institutional Leadership Effectiveness ($\beta = 0.438$, $p < 0.05$) made the greatest unique contribution to the implementation of RDM policies. Institutional Support ($\beta = 0.307$, $p < 0.05$) also made a significant positive contribution. RDM Infrastructure ($\beta = 0.215$, $p < 0.05$) contributed positively and significantly, although its influence was smaller than that of the other predictors. However, since all p-values are less than 0.05, the null hypotheses relating to the institutional leadership effectiveness does not have a significant relative influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria is rejected. The implementation of RDM policies in Nigerian universities is also influenced by the broader national research policy environment. Government interventions, particularly through the Tertiary Education Trust Fund (TETFund), have significantly strengthened research capacity by providing competitive research grants, supporting digital infrastructure development, funding academic staff training, and improving institutional research governance. These initiatives create favourable conditions for universities to establish institutional repositories, strengthen research data storage systems, and promote responsible research practices.

Nevertheless, the findings suggest that national funding initiatives alone are insufficient to guarantee effective RDM implementation. Institutional leadership remains responsible for translating externally supported programmes into sustainable internal policies, operational guidelines, and routine research practices. Universities that align their strategic plans with national research priorities are better positioned to maximize the benefits of TETFund interventions and other research funding opportunities. This finding agrees with recent evidence indicating that national policy support is most effective when accompanied by strong institutional leadership, effective governance structures, and continuous investment in human capacity development (UNESCO, 2021; Digital Science, 2023).

Therefore, closer alignment between institutional strategic objectives and national research policies is essential for strengthening research data management practices across Nigerian universities.

H₀₃: Institutional support and research data management infrastructure do not have significant relative influences on the implementation of Research Data Management (RDM) policies in Universities in North Central Nigeria.

Table 6: Multiple Regression Analysis Showing the Relative Influence of Institutional Support and Research Data Management Infrastructure on the Implementation of RDM Policies in Universities in North Central Nigeria.

Predictor Variable	Unstandardized Coefficient (B)	Std. Error	Standardized Coefficient (β)	t-value	Sig. (p)	Decision
Constant	0.864	0.243	-	3.556	0.001	-
Institutional Support	0.312	0.068	0.341	4.588	0.000	Reject H ₀
RDM Infrastructure	0.228	0.071	0.247	3.211	0.002	Reject H ₀

Source: Research, 2026

Level of Significance: $\alpha = 0.05$

Table 6 above of the standardized regression coefficients (β) indicates the relative contribution of each independent variable to the dependent variable. Institutional Support ($\beta = 0.341$, $p < 0.05$) made the greatest unique contribution to the implementation of RDM policies. RDM Infrastructure ($\beta = 0.247$, $p < 0.05$) contributed positively and significantly. However, since all p-values are less than 0.05, the null hypotheses relating to the Institutional support and research data management infrastructure do not have significant relative influences on the implementation of Research Data Management (RDM) policies in Universities in North Central Nigeria is rejected. An important issue emerging from this study concerns the long-term financial sustainability of research data management initiatives. Although many universities have benefited from initial investments in digital infrastructure, repository development, and staff capacity building, sustaining these initiatives requires continuous financial commitment beyond externally funded projects. Effective RDM systems require regular software upgrades, secure data storage facilities, cyber security measures, preservation infrastructure, technical support services, and continuous professional development for researchers and data managers.

The findings indicate that reliance solely on periodic government interventions or donor-funded projects may limit the sustainability of institutional RDM programmes. Sustainable implementation requires universities to integrate research data management into their annual budgeting processes, institutional strategic plans, and long-term research development policies. Diversification of funding sources through research grants, international collaborations, private-sector partnerships, and internally generated revenue can further enhance institutional resilience and reduce dependence on short-term funding opportunities. Similar observations have been reported in recent international studies, which argue that financial sustainability is fundamental to maintaining secure, accessible, and reusable research data infrastructures and ensuring compliance with evolving open science and data stewardship standards (OECD, 2021; Wilkinson et al., 2023). Consequently, institutional leaders should adopt long-term financing strategies that position research data management as an essential component of university research governance rather than a project-dependent activity.

B. Major Findings

The following are the major findings of this research:

1. Institutional leadership effectiveness had a significant positive influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria. The study found

that effective institutional leadership was the strongest predictor of successful RDM policy implementation, demonstrating that leaders play a critical role in policy development, implementation, monitoring, and stakeholder engagement.

2. Institutional support had a significant positive influence on the implementation of Research Data Management (RDM) policies in universities in North Central Nigeria. The findings revealed that adequate institutional support, including financial resources, administrative commitment, staff training, and policy enforcement, significantly enhances the effective implementation of RDM policies.

3. Research Data Management (RDM) infrastructure had a significant positive influence on the implementation of RDM policies in universities in North Central Nigeria. The study established that the availability of appropriate ICT facilities, institutional repositories, secure data storage systems, and other digital infrastructure significantly facilitates the successful implementation of RDM policies.

V. Discussion of the Findings

The findings demonstrate that institutional leadership is a critical determinant of successful Research Data Management (RDM) policy implementation in universities in North Central Nigeria. Participants acknowledged that institutional leaders actively participate in policy formulation, provide strategic direction, and encourage stakeholder involvement in research governance. The interview findings further showed that leadership commitment promotes accountability, facilitates institutional coordination, and strengthens compliance with research data management practices. This finding supports the position of UNESCO (2023), which emphasized that effective leadership is fundamental to promoting responsible research governance and advancing open science initiatives. Similarly, These findings support recent studies, which emphasize that transformational and collaborative leadership enhances institutional readiness for digital transformation and research governance by encouraging stakeholder participation, reducing resistance to change, and fostering organizational learning (Adekoya & Guobiazor, 2023; Cox et al., 2022). Consequently, university leaders should complement policy formulation with inclusive leadership strategies that encourage stakeholder engagement and strengthen institutional commitment to research data management. The European Commission (2023) argued that strong institutional leadership enhances the development and implementation of sustainable research data governance frameworks. The study also revealed that leadership facilitates innovation and compliance through strategic planning, staff development, and policy implementation. Although the participating universities had established documented RDM policies, practical implementation remained inconsistent because of inadequate training opportunities, limited dissemination of policies, and weak compliance monitoring mechanisms. Interview participants emphasized that leaders who invest in continuous professional development, institutional repositories, and digital research infrastructure create enabling environments for effective RDM implementation. These findings agree with the observations of OECD (2023), which reported that strategic leadership strengthens institutional capacity by aligning organizational resources with long-term research objectives. Likewise, OpenAIRE (2024) noted that leadership-driven investment in digital infrastructure and institutional innovation significantly improve research data accessibility and policy compliance.

Another important finding concerns the challenges confronting effective implementation of RDM policies. Respondents identified inadequate funding, insufficient ICT infrastructure, low digital literacy, limited technical expertise, resistance to organizational change, and weak monitoring systems as major barriers. The qualitative evidence further indicated that these challenges often delay policy implementation despite leadership commitment. These findings corroborate the report of the African Open Science Platform (2022), which identified inadequate technological infrastructure and insufficient institutional investment as persistent barriers to effective research data management across African universities. The findings also support the National Universities Commission (2023), which observed that inadequate institutional support and limited staff capacity continue to constrain research data governance within Nigerian universities. The regression analysis further demonstrated that

institutional leadership effectiveness, institutional support, and RDM infrastructure jointly exert significant influence on the implementation of RDM policies. This finding indicates that successful research data management depends on the interaction between visionary leadership, organizational support, and adequate technological resources rather than on any single factor. The result aligns with the propositions of Strategic Leadership Theory, which emphasizes that institutional leaders must integrate policy development, resource allocation, and organizational coordination to achieve sustainable institutional outcomes (OECD, 2023).

Furthermore, institutional leadership effectiveness emerged as the strongest predictor of successful RDM policy implementation, recording the highest standardized regression coefficient among the predictor variables. This finding suggests that leadership quality has greater influence than infrastructure or institutional support alone in determining the success of research data management initiatives. Effective leaders provide strategic vision, motivate institutional stakeholders, allocate resources efficiently, and create organizational cultures that encourage compliance and innovation. This finding is consistent with Transformational Leadership Theory, which argues that visionary leaders inspire organizational change and improve institutional performance (Northouse, 2024). It also supports UNESCO (2023), which emphasized that leadership commitment remains the cornerstone of successful research governance and open science implementation. Finally, institutional support and research data management infrastructure were found to have significant independent contributions to RDM implementation. This suggests that while leadership provides strategic direction, effective implementation also requires adequate financial investment, reliable ICT infrastructure, institutional repositories, skilled personnel, and continuous technical support. Without these complementary resources, leadership efforts alone may not achieve sustainable research data governance. This finding agrees with CAMRET (2022), which reported that institutional investment in digital infrastructure and staff capacity significantly improves compliance with research data management policies and enhances institutional research productivity.

VI. Conclusion

This study examined the role of institutional leadership in advancing Research Data Management (RDM) policies in universities in North Central Nigeria using a convergent mixed-methods research design. The findings demonstrate that institutional leadership is a fundamental driver of effective RDM policy adoption and implementation. Leaders who provide strategic direction, allocate resources, promote stakeholder engagement, and support capacity-building initiatives create an enabling environment for responsible research data governance. The quantitative findings, supported by qualitative evidence, showed that institutional leadership effectiveness, institutional support, and RDM infrastructure significantly influence the implementation of RDM policies, with leadership effectiveness emerging as the strongest predictor. The study also revealed that although many universities have developed RDM policy frameworks, effective implementation remains constrained by inadequate funding, insufficient ICT infrastructure, limited technical expertise, weak compliance monitoring, and low awareness of RDM best practices among researchers. These institutional and organizational challenges continue to impede the translation of policy into practice, thereby affecting research quality, data preservation, research visibility, and compliance with international standards.

Overall, the study concludes that effective leadership is indispensable for strengthening research data management in universities in North Central Nigeria. Institutional leaders must move beyond policy formulation to ensure sustained implementation through strategic planning, adequate resource allocation, continuous staff development, stakeholder collaboration, and regular monitoring of compliance. Strengthening these leadership practices will enhance research integrity, improve institutional research productivity, promote data sharing and preservation, and position Nigerian universities to participate more effectively in national and global research collaborations. The findings contribute to the growing body of knowledge on research governance and provide practical evidence

for university administrators, policymakers, and higher education stakeholders seeking to strengthen research data management systems in Nigeria.

VII. Recommendations

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

1. Institutional leadership should be strengthened to enhance the implementation of Research Data Management (RDM) policies. Since institutional leadership effectiveness was found to have the strongest significant influence on RDM policy implementation, university management should empower institutional leaders to provide strategic direction, enforce RDM policies, monitor compliance, and promote a culture of accountability in research data management.
2. Universities should improve institutional support for Research Data Management initiatives. Given that institutional support significantly influenced the implementation of RDM policies, university authorities should allocate adequate funding, establish functional research support units, organize regular staff training, and provide incentives that encourage compliance with RDM policies and best practices.
3. Universities should invest in adequate Research Data Management infrastructure. Since RDM infrastructure had a significant influence on policy implementation, universities should strengthen their ICT infrastructure by establishing and maintaining institutional repositories, secure data storage facilities, reliable internet connectivity, and modern digital technologies that support effective research data management.

References

- Adekoya, C.O. & Guobiazor, I. R. (2023). Leadership styles, organisational rewards and employees' commitment in academic libraries. *IFLA Journal*, 49(4), 664–677.
<https://doi.org/10.1177/03400352231202512>
- African Open Science Platform. (2022). *African Open Science Platform strategy and implementation framework*. Academy of Science of South Africa.
- Centre for African Management of Research and Educational Technologies (CAMRET). (2022). *Research data management practices in African universities*. CAMRET.
- Cox Wolfram, J., Madison, K., & Eva, N. (2022). Revisiting emergence in emergent leadership: An integrative, multi-perspective review. *The Leadership Quarterly*, 33(1), 101579.
<https://doi.org/10.1016/j.leaqua.2021.101579>
- European Commission. (2023). *Turning FAIR into reality: Implementing research data management and open science*. Publications Office of the European Union.
- Mark D. Wilkinson et al. (2023). *Community-driven governance of FAIRness assessment: an open issue, an open discussion*. Open Research Europe.
- National Universities Commission. (2023). *Guidelines for research governance and research data management in Nigerian Universities*. National Universities Commission.
- Northouse, P. G. (2024). *Leadership: Theory and practice* (10th ed.). Sage Publications.
- Organisation for Economic Co-operation and Development (OECD). (2023). *Building capacity for research data governance in higher education*. OECD Publishing.
- OpenAIRE. (2024). *Research data management and open science implementation guidelines for higher education institutions*. OpenAIRE.
- UNESCO. (2021). *UNESCO Recommendation on Open Science*.
- UNESCO. (2023). *Implementation of the UNESCO Recommendation on Open Science*. UNESCO.