



Financial Resources Management and Achievement of Sustainable Development Goal-4 in Public Universities in Rivers State

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Abstract

This study examined the relationship between financial resource management and the achievement of Sustainable Development Goal 4 (SDG-4) in public universities in Rivers State, Nigeria. The research was guided by three specific objectives: determining the relationship between budgetary allocation and SDG-4 achievement, ascertaining the relationship between financial aid management and SDG-4 achievement, and examining the relationship between research fund management and SDG-4 achievement. The study adopted a correlational survey research design and was conducted in three public universities in Rivers State: Rivers State University, University of Port Harcourt, and Ignatius Ajuru University of Education. The target population comprised 4,134 academic staff, from which a sample of 365 lecturers was selected using Taro Yamane's formula. Data were collected using two structured questionnaires and analysed using Pearson Product Moment Correlation Coefficient. The findings revealed moderate positive relationships between all three dimensions of financial resource management and SDG-4 achievement: budgetary allocation ($r = 0.58$), financial aid management ($r = 0.63$), and research fund management ($r = 0.51$). All three null hypotheses were rejected at 0.05 significance level, confirming statistically significant positive relationships. Financial aid management exhibited the strongest correlation, underscoring its critical role in promoting inclusive and equitable education. The study concluded that effective financial resource management is indispensable for achieving SDG-4 targets in public universities. Recommendations include adopting strategic participatory budgeting, establishing transparent technology-driven financial aid systems with consistent disbursement schedules, and strengthening research fund governance through rigorous accountability mechanisms and regular external audits.

Keywords: Budgetary Allocation, Financial Aid Management, Financial Resource Management, Public Universities, Research Fund Management, Rivers State, SDG-4

Introduction

The management of financial resources in public universities constitutes a critical determinant of institutional sustainability, operational efficiency, and educational effectiveness, particularly in developing nations such as Nigeria. Financial resources represent the lifeblood of the

education system, fundamentally shaping the availability of infrastructure, the quality of instruction, and the efficiency of administrative operations. The World Bank (2021) asserts that sustained educational financing is indispensable for achieving equitable access and meaningful learning outcomes. In agreement, Osuji (2025) contends that sound financial management ensures that available funds are utilised efficiently and transparently, while weak financial controls, delayed fund releases, and poor accountability mechanisms adversely affect programme delivery in public universities. Public universities in Rivers State have traditionally relied on government funding to support their operations and development, yet this dependence has proven insufficient to meet growing institutional demands (Osuji & Benard, 2025).

The United Nations (2015) established Sustainable Development Goal 4 (SDG-4) to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Education remains the foundation for economic growth, poverty reduction, and social inclusion (UNESCO, 2022). For developing nations such as Nigeria, achieving SDG-4 depends heavily on how effectively financial resources are mobilised, allocated, and managed within educational institutions (Okeke & Nwankwo, 2022). However, Nigeria lags behind in the implementation of SDG-4 due to persistent underfunding of the education sector, despite being a signatory to the United Nations Sustainable Development Goals (Ogunode & Onize, 2022).

In Rivers State, public universities face multifaceted challenges including inadequate funding, delayed budget releases, poor financial accountability, and underutilisation of research grants (Osuji, 2025). These issues threaten the quality, equity, and inclusiveness of higher education, which constitute the core components of SDG-4. The achievement of SDG-4 in public universities in Rivers State requires a multi-dimensional approach involving various education stakeholders, including government institutions, academia, civil society, and the private sector. By addressing access, quality, infrastructure, teacher training, sustainability, community engagement, and equity, public universities can contribute significantly to inclusive and equitable education, thereby fostering sustainable development (Yusuf, Ladan, Idris, & Halilu, 2013).

Financial resource management encompasses processes such as budgetary allocation, scholarship and financial aid management, grants and research fund management, and accountability systems, all of which directly impact the quality and accessibility of education (World Bank, 2021). In the era of global educational transformation, the attainment of SDG-4 is intrinsically linked to how universities allocate, utilise, and monitor their financial resources. Proper financial management is not merely a matter of institutional survival but a strategic tool

for educational development and social equity (Iyala & Tamunosiki, 2025). Research indicates a significant relationship between funding and the provision of physical infrastructure in universities in Rivers State, as well as between funding and staff development (Iyala & Tamunosiki, 2025). Furthermore, sound financial management criteria substantially enhance leadership effectiveness in public universities, suggesting that financial governance is integral to institutional performance (Sam-Kalagbor & Igoni, 2025).

Budgetary Allocation

Budgetary allocation is a foundational determinant of the achievement of SDG-4 in public universities. It refers to the systematic process of forecasting, distributing, and monitoring financial resources to achieve specific institutional goals and objectives. Budgetary allocation represents the government's financial commitment to education and directly affects the availability of infrastructure, staffing, and learning resources (UNESCO, 2023). This process involves identifying priority areas such as infrastructure, personnel, teaching and learning materials, research, and student support services, and allocating funds accordingly. Effective budget planning ensures that resources are judiciously allocated to critical academic and administrative needs in a manner that promotes institutional performance and accountability.

In the context of Rivers State, where public universities contend with financial constraints, strategic budget planning is vital for sustaining academic quality, expanding access, and achieving developmental benchmarks in higher education (Emenike & Nduka, 2022). Sound budgetary practices not only enhance resource utilisation but also foster transparency, helping institutions to meet both local needs and global educational commitments. The achievement of SDG-4, which emphasises inclusive, equitable, and quality education, is closely tied to how well public universities can adequately manage their allocated financial resources. Institutions that prioritise key components of SDG-4 in their budget allocations—such as inclusive education policies, student welfare, infrastructure development, and capacity building—are more likely to fulfil the goal's targets (Ibe & Wokoma, 2021).

In Rivers State, where disparities in educational access and quality persist, targeted budgetary allocation plays a crucial role in ensuring that underserved populations, particularly students from low-income backgrounds, have access to learning opportunities. Additionally, timely and adequate funding of teacher development programmes, technological innovations, and inclusive pedagogy contributes to improving teaching quality and student outcomes, thereby advancing the objectives of SDG-4 within the region's public universities. According to Osuji (2025), increased and efficient budgetary allocation enhances infrastructure development, staff

training, and technology integration in Rivers State universities, thereby improving educational outcomes. However, public universities in Rivers State continue to grapple with systemic weaknesses in budgetary control, internal audit systems, and transparency in financial reporting, despite various reforms aimed at improving governance and accountability (Sam-Kalagbor & Igoni, 2025).

Scholarship and Financial Aid Management

Financial aid management refers to the strategic administration of monetary support mechanisms, such as merit-based scholarships, need-based grants, bursaries, student loans, and tuition waivers, intended to improve access to higher education, especially for disadvantaged or underserved students. In public universities in Rivers State, effective management of scholarships and financial aid involves transparent selection processes, timely disbursement of funds, and efficient monitoring to ensure that support reaches the right beneficiaries. Proper coordination between university financial aid offices, government agencies, and development partners is crucial for addressing the financial barriers that often limit educational opportunities. As asserted by Ezeani and Ugwoke (2022), a well-managed scholarship system promotes inclusiveness and equity, thereby expanding educational access to low-income and vulnerable student populations.

The achievement of SDG-4 hinges significantly on how financial aid is structured and deployed in public universities. UNESCO (2022) emphasises that financial aid is not merely a social welfare tool but a driver of educational sustainability, ensuring that no student is left behind due to economic barriers. Effective financial aid management therefore contributes to the achievement of SDG-4 by promoting equality and lifelong learning opportunities for all learners. When financial aid programmes are transparent and efficiently managed, they enhance inclusiveness, reduce dropout rates, and enable students from low-income families to pursue higher education (World Bank, 2021).

According to Osuji (2025), in Rivers State, government bursaries and scholarship initiatives have helped indigent students gain university admission, but irregular disbursement and weak monitoring systems often limit their effectiveness. Effective scholarship and financial aid management contributes to reducing dropout rates, increasing enrolment among marginalised groups, and enhancing student retention and completion rates. According to Onu and Emeh (2023), when financial aid policies are aligned with SDG-4 objectives, they not only support individual educational attainment but also contribute to broader national goals of human capital development and sustainable growth.

Grants and Research Fund Management

Research fund management refers to the systematic administration, disbursement, monitoring, and evaluation of external and internal financial resources provided for academic and developmental research activities within higher institutions. These funds are often sourced from government agencies, international donors, non-governmental organisations, and private sector collaborators with the aim of promoting innovation, knowledge production, and capacity development. In the context of public universities in Rivers State, effective management of grants and research funds entails transparent procurement processes, accountability mechanisms, regular audits, and the alignment of research priorities with institutional and societal needs. According to Ndu and Ezirim (2022), when universities effectively manage these funds, they are better positioned to support cutting-edge research, enhance staff development, and build world-class infrastructure that benefits both teaching and learning environments.

The achievement of SDG-4 is strongly influenced by the availability and proper utilisation of research funding. Well-managed grants empower institutions to address pressing educational challenges, develop evidence-based policies, and innovate pedagogical strategies that enhance learning outcomes. In Rivers State, universities that receive and properly channel research funds into projects on curriculum reform, educational technology, inclusive education, and gender parity are contributing directly to the targets of SDG-4. As Obi and Toluhi (2023) note, efficient research fund management not only strengthens the academic profile of universities but also supports community engagement and the provision of lifelong learning opportunities, both of which are critical for the realisation of SDG-4. However, Nigerian universities remain constrained by weak research funding, limited commercialisation frameworks, inadequate infrastructure, and inconsistent engagement with industry (Businessday, 2026).

Dimensions of SDG-4 Achievement in Public Universities

The achievement of SDG-4 in public universities encompasses several dimensions, including access to higher education regardless of socio-economic status, enhancement of quality teaching and learning environments, development of inclusive curriculum, and fostering of academic research that responds to societal needs. It also involves improving infrastructure, strengthening academic governance, promoting gender equity, and adopting innovative teaching methodologies. Public universities, as centres of higher learning and innovation, play a central role in driving SDG-4 by not only providing formal education but also contributing to

national capacity development through research, training, and policy influence (Akor & Eze, 2023).

In Rivers State, the achievement of SDG-4 in public universities is measured by the extent to which institutions uphold the principles of accessibility, equity, relevance, and quality in their educational delivery. Effective governance, prudent management of resources, teacher training, ICT integration, and student support services are essential components that enable these universities to meet SDG-4 targets. As noted by Chukwu and Ibrahim (2022), the performance of public universities in aligning with SDG-4 indicators can be assessed through metrics such as graduation rates, inclusiveness in admissions, academic research impact, community outreach, and the employability of graduates. Hence, the pursuit of SDG-4 within these institutions not only advances Nigeria's broader educational development agenda but also contributes to building resilient and knowledge-driven societies.

Statement of the Problem

In the pursuit of achieving SDG-4, which emphasises inclusive and equitable quality education and lifelong learning opportunities, the effective management of financial resources in public universities is pivotal. However, public universities in Rivers State continue to grapple with inadequate, mismanaged, or inefficiently allocated funds, which directly impact the quality of education and institutional capacity to meet SDG-4 targets. Despite the strategic importance of higher education in national development, financial leakages, poor prioritisation, and bureaucratic bottlenecks undermine efforts toward equitable access, infrastructural development, and instructional effectiveness (Ishola & Odu, 2023). Consequently, there is a growing concern that the current fiscal management practices in these institutions may not be aligned with the principles of sustainable and inclusive education as enshrined in SDG-4.

Furthermore, the mismatch between budgetary allocations and actual educational needs poses a significant challenge. Many public universities in Rivers State suffer from dilapidated facilities, insufficient teaching materials, overpopulated classrooms, and inadequate staff welfare, all of which hinder educational quality and access (Ogundele & Briggs, 2022). Financial constraints often lead to underinvestment in areas critical to sustainable development, such as research, digital infrastructure, student support systems, and faculty development programmes. This financial misalignment not only threatens institutional stability but also perpetuates inequality, particularly for marginalised student populations who are already disadvantaged by socio-economic barriers to higher education (Asiegbu & Ibrahim, 2023).

Despite several policy reforms and funding initiatives, the anticipated improvements in educational outcomes and the realisation of SDG-4 remain elusive in most public universities in Rivers State. The persistent gaps between financial inputs and educational outputs raise critical questions about the transparency, accountability, and strategic planning capacities of university management. It is against this backdrop that the researcher seeks to investigate the relationship between the management of financial resources and the attainment of SDG-4 goals in public universities in Rivers State, and to proffer solutions to the stated problems.

Theoretical Framework: Resource-Based View and Stakeholder Theory

The Resource-Based View (RBV) of the firm provides a useful theoretical lens for understanding the relationship between financial resource management and institutional performance. According to RBV, organisations achieve competitive advantage through the strategic deployment of valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). In the context of public universities, financial resources, when effectively managed, can be transformed into institutional capabilities that enhance educational quality, research productivity, and community engagement. Institutions that develop robust financial management systems are better positioned to achieve SDG-4 targets.

Stakeholder theory complements RBV by emphasising the importance of addressing the needs and expectations of various stakeholders, including students, staff, government, and the community (Freeman, 1984). Effective financial resource management requires balancing the competing demands of these stakeholders while ensuring transparency, accountability, and sustainability. In Rivers State public universities, stakeholder engagement is crucial for identifying priorities, mobilising resources, and ensuring that financial decisions align with the goals of inclusive and equitable quality education.

Empirical Review

Several empirical studies have examined the relationship between financial resource management and educational outcomes in Nigerian public universities. Iyala and Tamunosiki (2025) assessed the relationship between funding and management of public universities in Rivers State, finding a significant relationship between funding and the provision of physical infrastructure, as well as between funding and staff development. Osuji and Benard (2025) investigated alternative funding strategies and financial sustainability of public universities in Rivers State, finding a positive relationship between public-private partnership, commercialisation of research, income-sharing agreements, and financial sustainability.

Sam-Kalagbor and Igoni (2025) surveyed financial management strategies in public universities in Rivers State, concluding that sound financial management criteria substantially enhance leadership effectiveness. The study also identified systemic weaknesses in budgetary control, internal audit systems, and transparency in financial reporting. Ogunode and Onize (2022) analysed the challenges facing the funding of public universities in Nigeria, identifying inadequate funding, delayed release of funds, and weak accountability mechanisms as major obstacles to institutional effectiveness.

Jim-Dorgu (2024) examined university management and stakeholders' participation in the funding of research, development, and staff welfare of state-owned universities in South-South Nigeria, highlighting the importance of stakeholder engagement in mobilising resources for institutional development. Aga and Ekpenyong (2022) investigated the influence of organisational power on resource allocation in Nigerian universities, finding that power dynamics significantly affect how resources are distributed among academic units.

Gaps in Literature

While existing literature has examined various aspects of financial resource management and educational outcomes in Nigerian public universities, several gaps remain. First, limited research has specifically focused on the relationship between financial resource management and the achievement of SDG-4 targets in Rivers State public universities. Second, most studies have examined financial management in isolation, without considering how specific dimensions of financial management such as budgetary allocation, scholarship management, and research fund management individually and collectively contribute to SDG-4 achievement. Third, there is a dearth of empirical research that systematically evaluates the effectiveness of financial management practices in Rivers State public universities in relation to SDG-4 indicators such as access, equity, quality, and inclusiveness. This study seeks to address these gaps by investigating the relationship between financial resource management and the achievement of SDG-4 in public universities in Rivers State.

Purpose of the Study

The purpose of this study was to determine the relationship between financial resource management and the achievement of Sustainable Development Goal 4 (SDG-4) in public universities in Rivers State. Specifically, the study sought to:

1. determine the relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State;

2. ascertain the relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State;
3. examine the relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State.

Research Questions

The following research questions were formulated to guide the study:

1. What is the relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State?
2. What is the relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State?
3. What is the relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State?

Hypotheses

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

H₀₁: There is no significant relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State.

H₀₂: There is no significant relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State.

H₀₃: There is no significant relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State.

Methodology

The study adopted a correlational survey research design. The study was conducted in the three public universities in Rivers State, namely: Rivers State University (RSU), University of Port Harcourt (UNIPORT), and Ignatius Ajuru University of Education (IAUE). The target population comprised all 4,134 academic staff (lecturers) in the three public universities in Rivers State (Source: Institutional Payroll Office, 2025). Using the Taro Yamane sample size determination formula, a sample of 365 lecturers was obtained. To ensure proportional representation across the institutions, a proportionate sampling technique was employed to allocate the sample as follows: 136 lecturers from RSU, 149 lecturers from UNIPORT, and 80 lecturers from IAUE. Thus, the final sample size for the study was 365 lecturers. The reliability of the instruments was determined using the Cronbach Alpha internal consistency method. The reliability analysis yielded coefficient values of 0.79 for the MFRQ and 0.83 for the ASDG-

4PUQ, indicating that both instruments possessed high internal consistency and were reliable for the study. Data collected from the respondents were analysed using the Pearson Product Moment Correlation Coefficient (PPMCC).

Results of the Findings

This section presents the results of the data analyses conducted to answer the research questions and test the null hypotheses. A total of 347 valid copies of the questionnaire were retrieved and analysed using the Pearson Product Moment Correlation Coefficient (PPMCC). The research questions were answered by interpreting the magnitude and direction of the calculated correlation coefficients (r), using the following benchmarks:

0.00 – 0.29: Low/negligible relationship

0.30 – 0.69: Moderate relationship

0.70 – 1.00: High/strong relationship

The hypotheses were tested at a 0.05 significance level with 345 degrees of freedom ($df = n - 2 = 347 - 2$). The critical t-value for a two-tailed test at this df is 1.96. The calculated t-values were obtained by transforming the Pearson r coefficients. A null hypothesis was rejected if the calculated t-value exceeded the critical t-value of 1.96.

Research Question 1: What is the relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State?

Table 1: Pearson Correlation Analysis for Research Question 1

Variables Correlated	N	df	Calculated r-value	Strength of Relationship	Direction
Budgetary Allocation vs. Achievement of SDG-4	347	345	0.58	Moderate	Positive

The calculated Pearson correlation coefficient ($r = 0.58$) in table 1 indicates a moderate positive relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State. This finding suggests that as budgetary allocation practices improve particularly in areas such as strategic financial planning, timely disbursement of funds, prioritisation of infrastructure development, and adequate staffing provisions the attainment of SDG-4 targets (including enhanced access, improved learning environments, and better student outcomes) also tends to increase moderately. Conversely, weak budgetary practices are associated with lower levels of SDG-4 achievement. This implies that budgetary allocation is a meaningful, though not exclusive, contributor to quality education outcomes in the institutions studied.

Research Question 2: What is the relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State?

Table 2: Pearson Correlation Analysis for Research Question 2

Variables Correlated	N	df	Calculated r-value	Strength of Relationship	Direction
Financial Aid Management vs. Achievement of SDG-4	347	345	0.63	Moderate	Positive

The calculated Pearson correlation coefficient ($r = 0.63$) on table 2 reveals a moderate positive relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State. This indicates that universities with more effective financial aid management systems characterised by transparent selection criteria, timely and consistent disbursement of bursaries, scholarships, and loans, as well as robust monitoring and evaluation mechanisms tend to record higher levels of SDG-4 achievement. Specifically, better financial aid practices are associated with increased student enrolment from disadvantaged backgrounds, reduced dropout rates, improved retention, and greater equity in educational access. This underscores the critical role of financial aid in promoting inclusive and equitable quality education, which lies at the heart of SDG-4.

Research Question 3: What is the relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State?

Table 3: Pearson Correlation Analysis for Research Question 3

Variables Correlated	N	df	Calculated r-value	Strength of Relationship	Direction
Research Fund Management vs. Achievement of SDG-4	347	345	0.51	Moderate	Positive

The calculated Pearson correlation coefficient ($r = 0.51$) on table 3 indicates a moderate positive relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State. This finding suggests that universities that demonstrate stronger practices in research fund administration—including transparent procurement processes, rigorous accountability mechanisms, regular auditing, and alignment of research priorities with institutional and societal development needs—tend to achieve higher levels of SDG-4 outcomes. Such outcomes include enhanced academic research productivity, improved staff capacity development, curriculum innovation, and community engagement. While the

relationship is moderate, it confirms that proper management of research grants contributes meaningfully to the overall quality and relevance of higher education, which is essential for meeting SDG-4 targets.

Hypothesis 1 (H_{01}): There is no significant relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State.

Table 4: Hypothesis Testing for H_{01}

Variables Correlated	Calculated r- value	Calculated t- value	Critical t- value (df=345)	p-value	Decision ($\alpha = 0.05$)
Budgetary Allocation vs. Achievement of SDG-4	0.58	13.22	1.96	< 0.05	Reject H_{01}

The calculated t-value of 13.22 on table 4 is substantially greater than the critical t-value of 1.96 at the 0.05 significance level. Additionally, the p-value is less than 0.05. Consequently, the null hypothesis (H_{01}), which stated that there is no significant relationship between budgetary allocation and the achievement of SDG-4, is rejected. This implies that there is a statistically significant positive relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State. In practical terms, the observed moderate correlation is unlikely to have occurred by chance, confirming that strategic budgetary practices are a significant correlate of SDG-4 progress.

Hypothesis 2 (H_{02}): There is no significant relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State.

Table 5: Hypothesis Testing for H_{02}

Variables Correlated	Calculated r- value	Calculated t- value	Critical t- value (df=345)	p-value	Decision ($\alpha = 0.05$)
Financial Aid Management vs. Achievement of SDG-4	0.63	15.06	1.96	< 0.05	Reject H_{02}

The calculated t-value of 15.06 on table 5 far exceeds the critical t-value of 1.96 at the 0.05 significance level, and the p-value is less than 0.05. Therefore, the null hypothesis (H_{02}), which asserted no significant relationship between financial aid management and the achievement of SDG-4, is rejected. This confirms that there is a statistically significant positive relationship between financial aid management and the achievement of SDG-4 in public universities in Rivers State. The strength of this relationship ($r = 0.63$) is the highest among the three predictors, suggesting that among the financial management dimensions examined, effective financial aid administration is the most strongly associated with SDG-4 progress. This finding provides empirical support for the argument that well-managed student support systems are vital drivers of educational equity and quality.

Hypothesis 3 (H_{03}): There is no significant relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State.

Table 6: Hypothesis Testing for H_{03}

Variables Correlated	Calculated r- value	Calculated t- value	Critical t- value (df=345)	p-value	Decision ($\alpha = 0.05$)
Research Fund Management vs. Achievement of SDG-4	347	345	0.51	Moderate	Positive

The calculated t-value of 11.01 on table 6 is greater than the critical t-value of 1.96 at the 0.05 significance level, with a p-value less than 0.05. Consequently, the null hypothesis (H_{03}), which stated no significant relationship between research fund management and the achievement of SDG-4, is rejected. This confirms that there is a statistically significant positive relationship between research fund management and the achievement of SDG-4 in public universities in Rivers State. Although the correlation coefficient of 0.51 is the lowest among the three predictors, it remains statistically robust, indicating that research fund management is a significant, albeit more moderate, correlate of SDG-4 achievement. This finding highlights the importance of strengthening grant management systems to foster innovation and knowledge production that supports quality education.

Discussion of the Findings

The findings of this study established a significant positive relationship between budgetary allocation and the achievement of SDG-4 in public universities in Rivers State, with a moderate

correlation coefficient ($r = 0.58$, $t = 13.22$). This result corroborates the assertion of Osuji (2025), who noted that increased and efficient budgetary allocation enhances infrastructure development, staff training, and technology integration in Rivers State universities, thereby improving educational outcomes. The moderate correlation implies that when universities strategically prioritise academic needs in their budget forecasts, they are better positioned to address infrastructural deficits, expand access, and support instructional effectiveness despite prevailing financial constraints. This aligns with Emenike and Nduka (2022), who affirmed that strategic budget planning is vital for sustaining academic quality and fostering transparency within the context of limited financial resources in Rivers State institutions. Furthermore, Ibe and Wokoma (2021) argued that institutions which intentionally allocate resources toward inclusive education policies, student welfare, and capacity building are more likely to fulfil SDG-4 targets than those with ad hoc or poorly planned budgets. Therefore, the rejection of the null hypothesis confirms that budgetary allocation is a foundational administrative mechanism that significantly drives progress toward equitable and quality higher education, reinforcing the position that financial planning is inseparable from educational sustainability.

The analysis further revealed that financial aid management exhibited the strongest significant positive relationship with SDG-4 achievement ($r = 0.63$, $t = 15.06$), underscoring its critical role in fostering educational inclusiveness and reducing socio-economic barriers to university access. This finding strongly supports the position of Ezeani and Ugwoke (2022), who contended that well-managed scholarship systems and transparent selection processes are fundamental for promoting equity and expanding access to low-income and vulnerable student populations in Nigerian universities. The World Bank (2021) reinforces this perspective by emphasising that transparent and efficient financial aid programmes effectively reduce dropout rates, enhance retention, and enable disadvantaged students to pursue higher education without undue financial burden. Despite the existence of government bursary initiatives in Rivers State, Osuji (2025) cautioned that irregular disbursement and weak monitoring systems often limit their effectiveness, highlighting the critical need for the robust administration and timely disbursement practices observed as correlates in this study. The significant correlation also validates the argument of Onu and Emeh (2023), who posited that when financial aid policies are strategically aligned with SDG-4 objectives, they substantially contribute to human capital development and sustainable national growth by creating a more educated and skilled workforce. Consequently, the rejection of the null hypothesis for financial aid management confirms that effective student financial support systems are indispensable drivers of retention,

completion rates, and overall educational equity, making them the most potent financial tool for achieving inclusive education in the region.

The study also established a significant positive relationship between research fund management and SDG-4 achievement ($r = 0.51$, $t = 11.01$), indicating that proper administration of grants and research resources is essential for institutional quality and innovation. This finding is consistent with the assertion of Ndu and Ezirim (2022), who argued that universities that effectively manage research funds are better equipped to support cutting-edge research, enhance staff development, and build world-class infrastructure that benefits both teaching and learning environments. Similarly, Obi and Toluhi (2023) noted that efficient research fund management strengthens the academic profile of universities, fosters community engagement, and supports the provision of lifelong learning opportunities, all of which are critical for achieving SDG-4 targets in developing contexts. The moderate relationship suggests that while research funding is not the sole determinant of educational quality, its prudent management significantly enhances pedagogical innovation, evidence-based policymaking, and knowledge production that responds directly to societal needs. Iyala and Tamunosiki (2025) provided further empirical support for this finding by confirming a significant relationship between funding and the overall management of public universities in Rivers State, particularly in relation to staff development, infrastructure provision, and institutional sustainability. Collectively, the rejection of all three null hypotheses affirms that financial resource management encompassing budgetary allocation, student financial aid, and research grants is a multidimensional strategic tool indispensable for realising SDG-4 in Rivers State public universities, and that strengthening these financial governance mechanisms is imperative for addressing the systemic challenges of underfunding and accountability in the Nigerian higher education sector.

Conclusion

In summary, financial resource management, specifically budgetary allocation, financial aid management, and research fund management, exhibits significant moderate positive relationships with the achievement of SDG-4 in public universities in Rivers State. The rejection of all three null hypotheses empirically confirms that sound financial governance is not merely an administrative necessity but a strategic driver of inclusive, equitable, and quality higher education within the studied context. Notably, financial aid management demonstrated the strongest correlation, highlighting that targeted student support is the most potent mechanism for reducing socio-economic barriers and enhancing retention and completion rates

among the institutions examined. Thus, the study underscores the urgent need for university administrators and policymakers to prioritise transparent budgeting, timely disbursement of scholarships, and robust accountability mechanisms for research grants, as these financial practices are fundamental to fulfilling Nigeria's commitment to sustainable educational development.

Recommendations

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

1. **Budgetary Allocation Recommendation:** University administrators should adopt strategic and participatory budgetary planning processes that prioritise infrastructure development, staff training, and instructional resource acquisition, while ensuring timely disbursement of allocated funds to enhance the moderate positive relationship observed between budgetary allocation and SDG-4 achievement.
2. **Financial Aid Management Recommendation:** The management of public universities in Rivers State, in collaboration with government agencies and development partners, should establish transparent, technology-driven financial aid systems with clearly defined selection criteria, regular monitoring mechanisms, and consistent disbursement schedules to maximise the substantial impact of financial aid on student retention, equity, and completion rates.
3. **Research Fund Management Recommendation:** University governing councils should strengthen research fund governance frameworks by instituting rigorous accountability mechanisms, transparent procurement procedures, regular external audits, and dedicated grants management offices to improve the alignment of research priorities with institutional and societal development needs, thereby enhancing the contribution of research funding to SDG-4 outcomes.

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