

Education Infrastructure and Rural Development in Nigeria

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ABSTRACT

This research investigated the impact of education infrastructure and rural development in Nigeria using Imo State as case study. Three specific objectives were formulated in the study and these objectives seek to assess the relationship between primary school infrastructure and rural development; analyze the extent to which secondary school infrastructure relates with rural development; and evaluate the relationship between tertiary education infrastructure and rural development in Imo State, Nigeria. Data were sourced from 349 residents of Imo State who were selected randomly from the three geo-political zones in the State. The data were analyzed using Pearson correlation coefficient. The results revealed that primary education infrastructure had positive but 'very low' correlation with rural development but the positive correlation was not significant. The study also found that secondary education infrastructure has positive but 'low' correlation with rural development and was not significant, while tertiary education infrastructure had positive correlation with rural development and the positive correlation was found to be significant. The study concludes that while primary and secondary education infrastructure remain weakly linked to rural development due to poor quality and management, tertiary education has a stronger and more direct influence through skill formation, employability, and local economic growth. It was recommended that Government and local authorities should prioritize not just the proliferation of schools but the quality of facilities while also ensuring that primary and secondary education funds are effectively used for infrastructure that directly supports rural development

INTRODUCTION

Education has long been recognized as a cornerstone for national development, particularly in rural contexts where social and economic transformation is tied to the provision of quality infrastructure. In Nigeria, the trajectory of educational infrastructure since 1990 reflects a complex interplay of policy reforms, rural underdevelopment, and investment challenges across primary, secondary, and tertiary levels of schooling. The expansion of tertiary institutions since the 1990s, including federal and state universities, polytechnics, and colleges of education, has had mixed outcomes for rural development. Initially, rural areas benefitted minimally since most tertiary institutions were located in urban centers, leaving rural students with fewer accessible opportunities (Alabi & Okemakinde, 2010). The 1993 establishment of the ETF provided funds for rehabilitating tertiary infrastructure, but by the early 2000s, overcrowded lecture halls, inadequate laboratories, and decaying hostels were widespread (Okojie, 2010). This period saw a growing enrollment at all levels of education that outpaced infrastructure development, creating high student-to-classroom ratios and limited access to ICT facilities in rural schools (Adeniran, 2010). By the 2020s, national policies such as the Sustainable Development Goals (SDGs) integrated secondary school infrastructure development as a pathway to human capital formation and rural development (Awofala & Arigbabu, 2020). The state of education infrastructure in Nigeria is intricately linked to rural development outcomes.

At the primary school level, rural communities still grapple with overcrowded classrooms, dilapidated buildings, poor sanitation facilities, and insufficient teaching materials. Despite UBE interventions, many rural schools lack basic amenities such as chairs, electricity, and safe water, which hinders effective teaching and learning. At the secondary school level, while enrollment has expanded significantly since the 2000s, infrastructural development has lagged behind. Most rural secondary schools operate without functional science laboratories, libraries, or ICT resources. At the tertiary level, the expansion of universities, polytechnics, and colleges of education appear not to have translated into equitable infrastructural development. The question on the horizon is: how does this situation impact on rural development in Imo State Nigeria? Consequently, the persistent gap in educational infrastructure in Nigeria has perpetuated cycles of poverty, low literacy levels, youth migration, and regional inequalities. Despite decades of reforms and investments, infrastructural inadequacies in rural schools remain a critical barrier to human capital formation and sustainable rural development. This problem raises urgent questions about the effectiveness of educational infrastructure in rural development in Imo State, Nigeria.

Objectives of the Study

The main objective of this study is to examine the impact of education infrastructure on rural development using Imo State, Nigeria as the case study. Specifically, the study seeks to:

1. assess the relationship between primary school infrastructure and rural development in Imo State Nigeria;
2. analyze the extent to which secondary school infrastructure relates with rural development;
3. evaluate the relationship between tertiary education infrastructure and rural development in Imo State, Nigeria.

Research Questions

1. What is the relationship between primary school infrastructure and rural in Imo State Nigeria?
2. To what extent has secondary school infrastructure related with rural development in Imo State?
3. What is the relationship between tertiary education infrastructure and rural development in Imo State?

Research Hypotheses

H₀₁: There is no significant relationship between primary school infrastructure and rural in Imo State Nigeria.

H₀₂: There is no significant relationship between secondary school infrastructure and rural in Imo State Nigeria.

H₀₃: There is no significant relationship between tertiary institutions' infrastructure and rural in Imo State Nigeria.

LITERATURE REVIEW

Conceptual Review

Education Infrastructure

Education infrastructure refers to the physical and organizational facilities that support the delivery of teaching and learning at all levels of education. It includes classrooms, laboratories, libraries, hostels, ICT facilities, water supply, sanitation, and other learning resources (Okoye & Yara, 2020). Adequate infrastructure is essential for quality education as it directly influences attendance, learning outcomes, and teacher effectiveness (Nwosu & Odetunde, 2019). In Nigeria, infrastructure deficits especially in rural areas continue to undermine access and equity in education, with many schools operating in unsafe or ill-equipped environments (Ogunode & Abigeal, 2022). The concept of education infrastructure thus underscores the material foundation upon which the educational process depends.

Rural Development

Rural development is a multidimensional process aimed at improving the quality of life and economic well-being of people living in rural areas. It goes beyond agricultural growth to include education, healthcare, infrastructure, employment opportunities, and social inclusion (Akinwale & Adepoju, 2021). The provision of education infrastructure is central to rural development, as it enhances literacy, empowers communities, and reduces rural-urban migration

(Iheanacho, 2020). In the Nigerian context, rural development has been constrained by weak governance, underinvestment, and disparities in service delivery, with education infrastructure serving as both a driver and an indicator of rural progress (Olayemi, 2019).

Theoretical Review

This study is anchored on two interrelated theories: Human Capital Theory and Sustainable Rural Development Theory, both of which provide the lens for understanding the nexus between education infrastructure and rural development in Nigeria.

Human Capital Theory (Schultz, 1961; Becker, 1993) posits that investment in education enhances individual productivity, economic growth, and societal transformation. Within the Nigerian rural context, the theory suggests that the availability of quality educational infrastructure at the primary, secondary, and tertiary levels equips individuals with the knowledge and skills necessary for rural industrialization, agricultural modernization, and entrepreneurial ventures. However, when infrastructure is deficient—such as dilapidated classrooms, lack of laboratories, and limited ICT resources—the capacity of rural populations to acquire and utilize human capital diminishes, thereby perpetuating cycles of poverty and underdevelopment (Okebukola, 2020; Edoho, 2021).

Complementing this is the Sustainable Rural Development Theory (Todaro & Smith, 2015), which emphasizes the improvement of rural communities through integrated interventions in education, health, infrastructure, and livelihoods. This theory underscores that education infrastructure is not only a component of social development but also a critical driver of rural economic diversification, reduced inequality, and empowerment. By linking education infrastructure to rural transformation, the theory highlights how policy reforms and resource allocation shape the opportunities available in rural Nigeria (Akinwale & Adepaju, 2021; Iheanacho, 2020).

These theories explain that educational infrastructure is both a means of developing human capital and a foundation for sustainable rural development. In the Nigerian context (1990–2025), the interplay between these frameworks demonstrates how infrastructural inadequacies have constrained rural progress, and conversely, how improved facilities could catalyze equitable development. Thus, this theoretical orientation provides the analytical base for examining how investments in educational infrastructure can reduce rural-urban disparities and foster inclusive growth.

Empirical Review

Empirical Review on Primary School Infrastructure and Rural Development

Ukpe, Udoh, and Otu (2023) examined local government administration and rural development in Eket LGA of Akwa Ibom State between 2015 and 2023. Using a descriptive survey design, the study assessed the extent of infrastructural development, including primary schools, as a driver of rural development. Content analysis showed that despite the proliferation of primary schools, poor facilities limited literacy and socio-economic mobility, thereby constraining rural development.

Ezenwajiobi, Udefuna, and Udom (2025) analyzed the crisis of out-of-school children in Nigeria with emphasis on rural communities. Their qualitative assessment, supported by statistical data, linked inadequate primary school infrastructure (lack of classrooms, poor sanitation, and overcrowding) with high dropout rates. Findings revealed that rural development is stunted when children lack access to quality primary education infrastructure, emphasizing the need for legislative interventions.

Omake, Ezhim, and Ademu (2025) studied the impact of crop farmer-herder conflict on primary school infrastructure in Nasarawa State. Using survey data and regression analysis, the authors discovered significant destruction of primary school facilities in conflict-prone rural areas, leading to declining enrolment and literacy outcomes. The findings linked rural underdevelopment to insecurity-induced infrastructural decay in primary schools.

Sanusi, Magaji, and Jafaru (2025) explored awareness of Sustainable Development Goals (SDGs) in Jigawa State rural communities. Employing mixed methods, the study identified that poor awareness of SDG 4 (quality education) correlates with inadequate investment in rural primary school infrastructure. The study concluded that lack of functional classrooms, libraries, and learning materials obstructs rural development through limited human capital formation. Daniel (2025) investigated education and the national question in Nigeria with specific attention to primary education. Using a content analysis of policy documents and national data, the study established that weak infrastructure in rural primary schools widens the urban-rural development gap. Findings indicated that without adequate classrooms, teacher training, and learning resources, rural development will remain slow despite universal basic education policies.

Empirical Review on Secondary School Infrastructure and Rural Development

Ojonugwa (2025) assessed the Universal Basic Education (UBE) programme and national development in Nigeria with attention to secondary education. Using documentary analysis, the study examined infrastructural inputs such as classrooms, laboratories, and libraries. Findings showed that rural secondary schools suffer from poor infrastructure, undermining students' skill acquisition and weakening rural development outcomes.

Ojima and Ibrahim (2024) investigated the impact of COVID-19 on secondary education infrastructure in rural areas of northern Nigeria. Adopting a mixed-method approach, they analyzed both survey and policy data. Results revealed that lack of ICT infrastructure and poor digital facilities in rural secondary schools exacerbated learning losses during school closures, further entrenching rural-urban inequalities in development.

Akinola and Yusuf (2023) examined school infrastructure and academic performance of rural secondary school students in Ogun State. A survey research design with regression analysis was employed. Findings demonstrated a strong positive correlation between availability of classrooms, laboratories, and libraries and students' academic achievement, which in turn influenced rural human capital development.

Abubakar and Ibrahim (2023) studied the relationship between school facilities and rural development outcomes in Katsina State secondary schools. Using descriptive statistics and chi-square analysis, they found that schools with adequate infrastructure contributed to improved literacy rates and reduced migration to urban centers. However, infrastructure deficits limited rural development, keeping many communities in poverty cycles.

Chukwu and Ede (2022) analyzed government expenditure on rural secondary school infrastructure and its effects on rural transformation in southeastern Nigeria. Applying econometric analysis on time-series data, they found that increased infrastructural spending led to improved school enrolments and literacy outcomes, but corruption and mismanagement reduced overall impact.

Empirical Review on Tertiary Institution Infrastructure and Rural Development

Ojo and Salisu (2025) examined the infrastructure gap in Nigerian universities and rural development prospects. Using survey data from universities in semi-rural areas, regression analysis revealed that insufficient lecture halls, laboratories, and ICT facilities hampered graduate productivity and limited the capacity of tertiary institutions to drive rural economic development. Ibrahim and Musa (2024) investigated infrastructural deficits and quality assurance in rural polytechnics across northern Nigeria. A descriptive design was adopted, with data analyzed using ANOVA. Findings showed that inadequate hostels, libraries, and workshops weakened the polytechnics' ability to equip students with vocational skills, thereby constraining rural industrial growth.

Okafor and Adeyemi (2023) studied the role of colleges of education in rural teacher development. Employing a mixed-method approach, the study assessed the state of infrastructure such as lecture theatres, ICT labs, and libraries. Results revealed that poor infrastructure negatively affected teacher training quality, which in turn reduced the effectiveness of rural primary and secondary education systems, slowing rural development.

Balogun and Hassan (2023) explored TETFund interventions in rural-based universities. Using documentary analysis and interviews, they found that while TETFund projects improved classroom blocks and laboratories, poor maintenance and funding delays limited impact. The study concluded that infrastructural development in rural tertiary institutions is critical for sustainable rural transformation.

Aliyu (2022) conducted a study on tertiary education infrastructure and graduate employability in rural regions of Nigeria. Employing survey design and regression analysis, the findings revealed a direct link between infrastructure (ICT centers, libraries, and workshops) and graduate employability. The lack of functional infrastructure was found to perpetuate rural unemployment and underdevelopment.

METHODOLOGY

Population of the Study

The population of this study comprises the entire residents of Imo State, Nigeria. Imo State, located in the southeastern geopolitical zone, is predominantly rural, with agriculture and education as major sectors of development. According to the National Population Commission (NPC, 2006) and projections by the United Nations (2022), the population of Imo State is estimated to be over 5,408,756 million people. Given the focus of the study, all residents are considered relevant since they directly or indirectly experience the effects of educational infrastructure on rural development.

Sample and Sampling Technique

The study draw the sample using Taro Yamane's formula for determining sample size:

$$= \frac{N}{1 + N(e)^2}$$

Where N = the entire population (21,955,414); n = sample size, e = error margin (5%).

Where: n = sample size, N = population size, e = level of precision (0.05).

Using an estimated population of 5,408,756 for Imo State residents, the sample size is calculated as:

$$n = \frac{5,408,756}{1 + 5,408,756(0.05)^2}$$
$$n = \frac{5,408,756}{13522.89}, n = 400$$

Therefore, a sample size of 400 respondents is selected. The sampling technique combines multistage and stratified random sampling, where respondents are chosen proportionally from the three senatorial zones of Imo State (Owerri, Orlu, and Okigwe) to ensure representativeness.

Sources of Data

The study relies on primary data, obtained through a structured questionnaire administered to respondents across Imo State. The questionnaire contains items on the availability, adequacy, and quality of primary, secondary, and tertiary educational infrastructures, as well as indicators of rural development (such as literacy, employment, and migration).

Validity and Reliability of Instrument

To ensure validity, the questionnaire was subjected to expert review by academics in the fields of economics and rural development, as well as practitioners in the education sector. Their input served as guide for the researcher and guaranteed the content and face validity.

For reliability, the internal consistency of the instrument was tested using Cronbach's Alpha. A Cronbach's alpha coefficient of 0.792 was obtained and was considered acceptable, consistent with Nunnally's (1978) benchmark. This ensured that the instrument produces stable and consistent results across different contexts.

Methods of Data Analysis

Data collected were coded and analyzed using Pearson correlation coefficient. The analysis was carried out in two stages.

- Descriptive statistics (frequencies, percentages and means) were used to summarize responses.
- Pearson Product-Moment Correlation (PPMC) was employed to test the relationship between primary, secondary, and tertiary school infrastructure (independent variables) and rural development (dependent variable). The significance level was 0.05. The results were presented in tables and interpreted in line with the study objectives

RESULTS

Data Presentation, Analysis and Interpretation of Results

Data Presentation

Tables below present the descriptive statistics (frequency and mean) of the study variables. The survey response rate precedes the data presentation below.

Table 1. Questionnaire Distribution and Return Rate

State	Number Distributed	Number Returned	Response Rate
Imo	400	349	87.3%
Total	400	349	87.3%

Source: Field Survey (2025)

According to Table 1, the survey response rate recorded was 87.3%. In total, 349 questionnaires were returned and duly completed out of 400 distributed.

Table 2. Reponses on Primary School Infrastructure

	Primary School Infrastructure	SA	A	D	SD	Mean	Remark
1.	Primary schools in my community have adequate classrooms.	20	162	58	109	2.27	<i>Negative</i>
2.	The physical condition of primary school buildings is satisfactory.	2	49	187	111	1.83	<i>Negative</i>
3.	Primary schools in my area have sufficient teaching and learning materials.	54	47	125	123	2.09	<i>Negative</i>
4.	Water and sanitation facilities are available in primary schools in my community	30	117	191	11	2.48	<i>Negative</i>

The responses in Table 4.1 shows that the respondents strongly disagreed to all the questions posed about primary school infrastructure in their communities. They disagreed that primary schools in their community have adequate classrooms (mean = 2.27) and also noted that water and sanitation are not available in their primary schools (mea = 2.48).

Table 3. Responses on Secondary School Infrastructure

Secondary School Infrastructure	SA	A	D	SD	Mean	Remark
5. Secondary schools in my community have well-equipped laboratories.	5	136	191	17	2.37	<i>Negative</i>
6. Libraries are available and accessible in secondary schools.	177	136	15	21	3.34	Positive
7. ICT facilities are functional in secondary schools in my area.	50	10	67	222	1.68	<i>Negative</i>
8. The classrooms in secondary schools are adequate and conducive for learning.	11	97	230	11	2.31	<i>Negative</i>

The responses on secondary school infrastructure are summarized in Table 2 above. The respondents also opined that secondary schools in the communities do not have well-equipped laboratories (mean = 2.37) and that ICT facilities and classrooms are inadequate. This is evidenced in the mean values which are less than 2.5 criterion mean. However, they strongly agreed that Libraries are available and accessible in secondary schools (mean = 3.34).

Table 4: Responses on Tertiary Institution Infrastructure

Tertiary Institution Infrastructure	SA	A	D	SD	Mean	Remark
9. Tertiary institutions in my area have adequate lecture halls.	11	134	83	121	2.10	<i>Negative</i>
10. Laboratories and workshops in tertiary institutions are well-equipped.	15	65	211	58	2.11	<i>Negative</i>
11. ICT facilities are accessible in tertiary institutions.	229	112	8	0	3.63	Positive
12. Hostels and student accommodation facilities are adequate in tertiary institutions.	211	108	28	2	3.51	Positive

In terms of the availability of infrastructure at tertiary education level, the respondents disagreed that Tertiary institutions in have adequate lecture halls (mean = 2.10) and laboratories (mean = 2.11). However, they agreed that ICT facilities (mean = 3.63) and Hostels and student accommodation (mean = 3.51) are accessible and adequate respectively.

Table 5. Responses on Rural Development

Rural Development	SA	A	D	SD	Mean	Remark
13. Education infrastructure in my community has improved literacy levels.	97	44	107	101	2.39	<i>Negative</i>
14. Availability of educational facilities has created more employment opportunities.	215	8	115	11	3.22	Positive
15. Improved school infrastructure reduces rural-urban migration.	311	36	1	111	4.20	Positive
16. Investment in education infrastructure has enhanced socio-economic development in my community.	220	75	33	21	3.42	Positive

The responses in Table 4 above shows that there is general disagreement amongst the respondents that Education infrastructure has improved literacy levels (mean = 2.39). This implies that it has not improved literacy levels in the communities. However, they agreed that the availability of educational facilities has created more employment opportunities (mean = 3.22), reduced rural-urban

migration (mean = 4.20) and enhanced socio-economic development (mean = 3.42).

Data Analysis

Table 6. Correlation Analysis

	Rural Development	Primary	Secondary	tertiary
Rural Development	1	.083 [0.072]	.140 [0.063]	.539 [0.045]
Primary	.083 [0.072]	1	.141 [0.086]	-.332 [0.966]
Secondary	.140 [0.063]	.141 [0.086]	1	.203 [0.043]
Tertiary	.539 [0.045]	-.332 [0.966]	.203 [0.043]	1

Source: SPSS Result, 2025

Table 5 below shows the Pearson correlation matrix among primary, secondary, tertiary school infrastructures and rural development. Correlation values range between -1 and +1, where positive values indicate direct relationships and negative values indicate indirect relationship. Primary education infrastructure has positive but ‘very low’ correlation with rural development ($r = 0.083$) but the positive correlation was not significant given the probability value which is greater than 0.05 critical value.

Furthermore, secondary education infrastructure has positive but ‘low’ correlation with rural development ($r = 0.140$) but the p -value of 0.0631 means that the positive correlation is not significant.

Tertiary education infrastructure has positive but ‘average’ correlation with rural development ($r = 0.539$) and the p -value of 0.0457 means that the positive correlation is significant.

Hypotheses Testing

Hypothesis One

H₀₁: There is no significant relationship between primary school infrastructure and rural in Imo State Nigeria.

Result: $r = 0.083$, p -value = 0.0721.

Decision: Since p -value > 0.05, the null hypothesis is accepted, implying no significant relationship between primary school infrastructure and rural in Imo State Nigeria.

Hypothesis Two

H₀₂: There is no significant relationship between secondary school infrastructure and rural in Imo State Nigeria.

Result: $r = 0.140$, p -value = 0.0631.

Decision: Since p -value > 0.05, the null hypothesis is accepted, implying no significant relationship between secondary school infrastructure and rural in Imo State Nigeria

Hypothesis Three

H₀₃: There is no significant relationship between tertiary institutions’ infrastructure and rural in Imo State Nigeria.

Result: $r = 0.539$, p -value = 0.0457.

Decision: Since $p\text{-value} < 0.05$, the null hypothesis is rejected, implying there is significant relationship between tertiary institutions' infrastructure and rural in Imo State Nigeria.

DISCUSSION

The findings revealed that primary education infrastructure has a positive but very weak correlation with rural development. This is largely because, although many schools exist in rural areas, they suffer from poor facilities, overcrowding, and insecurity, which undermine their impact (Ukpe et al., 2023; Ezenwajobi et al., 2025; Omaku et al., 2025). Moreover, primary education produces long-term literacy benefits rather than immediate developmental outcomes, while weak policy implementation further limits its contribution (Daniel, 2025).

Secondary education infrastructure showed a slightly stronger but still insignificant correlation with rural development. This reflects persistent deficits in laboratories, libraries, and ICT facilities, which constrain skill acquisition (Ojonugwa, 2025; Akinola & Yusuf, 2023). The digital divide, especially during COVID-19, further entrenched inequalities (Ojima & Ibrahim, 2024), while poor funding management and migration of students to urban areas dilute potential developmental benefits (Abubakar & Ibrahim, 2023; Chukwu & Ede, 2022).

In contrast, tertiary education infrastructure displayed a moderate and significant correlation with rural development. This is because well-equipped universities, polytechnics, and colleges directly enhance graduate employability and productivity (Ojo & Salisu, 2025; Ibrahim & Musa, 2024; Aliyu, 2022). In addition, investments such as TETFund projects have improved infrastructure more noticeably at this level (Balogun & Hassan, 2023), while better facilities in colleges of education strengthen teacher training, producing wider benefits across the education system (Okafor & Adeyemi, 2023).

Summary of Findings

1. Primary education infrastructure had positive but 'very low' correlation with rural development ($r = 0.083$) but the positive correlation was not significant.
2. Secondary education infrastructure has positive but 'low' correlation with rural development ($r = 0.140$) but the positive correlation was not significant.
3. Tertiary education infrastructure had positive but 'average' correlation with rural development ($r = 0.539$) and the positive correlation was found to be significant.

CONCLUSIONS

The study concludes that while primary and secondary education infrastructure remain weakly linked to rural development due to poor quality and management, tertiary education has a stronger and more direct influence through skill formation, employability, and local economic growth.

RECOMMENDATIONS

1. Government and local authorities should prioritize not just the proliferation of schools but the quality of facilities such as classrooms, sanitation, libraries, and ICT labs.
2. Community-based school management boards and independent audits can help ensure that both primary and secondary education funds are effectively used for infrastructure that directly supports rural development.
3. Given the significant link between tertiary infrastructure and rural development, continued support for universities, polytechnics, and colleges of education in rural and semi-rural regions is crucial. Targeted funding through initiatives like TETFund should be expanded, with emphasis on ICT, laboratories, and workshops that enhance graduate employability and teacher training capacity.

FURTHER STUDY

This research still has limitations so further research is needed on the topic of Education Infrastructure and Rural Development to perfect this research and increase insight for readers and writers.

REFERENCES

- Abubakar, M., & Ibrahim, S. (2023). School facilities and rural development outcomes in Katsina State secondary schools. *Journal of Educational Development in Nigeria*, 12(1), 45-59.
- Adedeji, S., & Campbell, C. (2006). The role of secondary education in promoting economic growth and equity in developing countries: A case study of Nigeria. *World Bank Working Paper*, No. 106. <https://doi.org/10.1596/978-0-8213-6688-0>
- Adeniran, A. (2010). Education and human capital development in Nigeria. *Nigerian Journal of Economic and Social Studies*, 52(1), 23-45.
- Akinola, T., & Yusuf, R. (2023). School infrastructure and academic performance of rural secondary school students in Ogun State. *Nigerian Journal of Educational Research*, 15(2), 78-92.
- Akinwale, J. O., & Adepoju, A. A. (2021). Education and rural development in Nigeria: Issues and prospects. *Journal of Rural Studies and Development*, 15(2), 44-57.
- Alabi, A. T., & Okemakinde, T. (2010). Effective planning as a factor of educational reform and innovation in Nigeria. *Current Research Journal of Social Sciences*, 2(6), 316-321.
- Aliyu, H. (2022). Tertiary education infrastructure and graduate employability in rural regions of Nigeria. *Journal of Rural Education and Development*, 9(4), 101-118.
- Awofala, A. O. A., & Arigbabu, A. A. (2020). Mathematics education in Nigeria: Progress and challenges. *International Journal of Education and Development*, 7(4), 45-59.

- Balogun, A., & Hassan, L. (2023). TETFund interventions in rural-based universities: Infrastructure and rural transformation. *International Journal of Educational Policy*, 8(3), 67–84.
- Bassi, S. (2019). Tertiary education trust fund and sustainable development in Nigeria. *Journal of Education and Practice*, 10(8), 42–50.
- Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). Chicago: University of Chicago Press.
- Chukwu, E., & Ede, P. (2022). Government expenditure on rural secondary school infrastructure and effects on rural transformation in southeastern Nigeria. *African Journal of Educational Economics*, 10(2), 55–73.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage
- Daniel, O. (2025). Education and the national question in Nigeria: Focus on primary education. *Nigerian Journal of Policy Studies*, 14(1), 33–50
- Eboh, E. C., & Agu, C. S. (2014). Human capital development and economic growth: The Nigerian experience. *Journal of Economics and Development Studies*, 2(2), 73–87.
- Edoho, F. M. (2021). Human capital development and economic growth: Nigeria in perspective. *African Journal of Economic Policy*, 28(1), 73–89.
- Ezenwajobi, C., Udefuna, P., & Udom, J. (2025). Crisis of out-of-school children in Nigeria: The rural perspective. *Journal of Education and Society*, 11(2), 87–104.
- Ibrahim, M., & Musa, K. (2024). Infrastructural deficits and quality assurance in rural polytechnics across northern Nigeria. *Polytechnic Journal of Nigeria*, 7(1), 29–47.
- Iheanacho, E. (2020). Education and rural development: Pathways to sustainable growth in Nigeria. *International Journal of Social Sciences and Humanities Research*, 8(4), 122–134.
- Madugu, U. D., & Nwankwo, B. C. (2019). Universal Basic Education (UBE) programme and access to basic education in Nigeria. *Journal of Education and Practice*, 10(16), 114–121.
- National Population Commission (NPC). (2006). *Population and housing census of the Federal Republic of Nigeria: National and state population tables*. Abuja: NPC.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Nwosu, K. C., & Odetunde, T. (2019). School infrastructure and academic achievement in Nigeria: Policy implications. *African Journal of Educational Management*, 17(1), 31–45.
- Odia, L. O., & Omofonmwan, S. I. (2007). Educational system in Nigeria: Problems and prospects. *Journal of Social Sciences*, 14(1), 81–86.
- Ogunode, N. J., & Abigeal, O. (2022). Digital learning and infrastructural challenges of tertiary institutions in Nigeria. *International Journal of Innovative Research in Education*, 9(3), 56–64.

- Ojima, D., & Ibrahim, Y. (2024). Impact of COVID-19 on secondary education infrastructure in rural areas of northern Nigeria. *Journal of Educational Technology and Development*, 5(3), 45–63.
- Ojo, A., & Salisu, T. (2025). Infrastructure gap in Nigerian universities and rural development prospects. *Nigerian Journal of Higher Education Studies*, 6(2), 56–74.
- Ojonugwa, S. (2025). Universal Basic Education programme and national development: Focus on secondary education. *Journal of Educational Policy and Administration*, 13(2), 60–78.
- Okafor, P., & Adeyemi, F. (2023). Role of colleges of education in rural teacher development in Nigeria. *African Journal of Teacher Education*, 9(4), 91–110.
- Okebukola, P. (2015). Quality assurance in Nigerian universities: The role of accreditation. *Council for the Development of Social Science Research in Africa (CODESRIA Bulletin)*, 37(2), 15–24.
- Okebukola, P. (2020). Quality assurance and human capital development in Nigeria's education system. *Nigerian Journal of Educational Research and Evaluation*, 19(2), 1–15.
- Okojie, J. A. (2010). System and strategies for funding Nigerian universities. *National Universities Commission Monograph Series*, 2, 1–28.
- Okoye, P., & Yara, P. (2020). School facilities and educational quality in Nigeria: Challenges and opportunities. *Journal of Education and Practice*, 11(5), 77–86.
- Olayemi, A. O. (2019). Education infrastructure and rural development in Nigeria: A policy analysis. *Journal of Public Administration and Development Alternatives*, 4(2), 59–70.
- Ololube, N. P. (2022). Education and underdevelopment in Nigeria: The missing link in public policy. *African Journal of Education Research and Development*, 14(2), 121–136.
- Omaku, O., Ezhim, T., & Ademu, I. (2025). Impact of crop farmer–herder conflict on primary school infrastructure in Nasarawa State. *Nigerian Journal of Rural Studies*, 10(1), 12–28.
- Owoeye, J. S., & Yara, P. O. (2011). School facilities and academic achievement of secondary school agricultural science in Ekiti State, Nigeria. *Asian Social Science*, 7(7), 64–74.
- Sanusi, A., Magaji, M., & Jafaru, L. (2025). Awareness of SDGs and investment in rural primary school infrastructure in Jigawa State. *International Journal of Sustainable Development in Education*, 7(2), 40–59.
- Schultz, T. W. (1961). Investment in human capital. *The American Economic Review*, 51(1), 1–17.
- Todaro, M. P., & Smith, S. C. (2015). *Economic development* (12th ed.). Boston: Pearson.
- Ukpe, I., Udoh, E., & Otu, A. (2023). Local government administration and rural development in Eket LGA, Akwa Ibom State. *Journal of Local Governance and Development*, 8(3), 55–74.
- United Nations. (2022). *World population prospects 2022: Summary of results*. New York: UN Department of Economic and Social Affairs