

SCHOOL PLANT MAINTENANCE APPROACHES OF PRINCIPALS IN PUBLIC SENIOR SECONDARY SCHOOLS IN PLATEAU STATE: URBAN AND RURAL PERSPECTIVES

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Abstract

This study examined the school plant maintenance approaches of principals in public senior secondary schools in Plateau State, Nigeria, with emphasis on urban and rural perspectives. A comparative survey research design was adopted, and a sample of 1,744 respondents, including principals, teachers, and Senior Secondary School Three (SS III) students, was drawn from a population of 18,078 using multi-stage sampling. Data were collected with the School Plant Maintenance Approaches Questionnaire (SPMAQ) and the Document on School Maintenance Records (DSMR), and analyzed using descriptive statistics and independent t-test. Findings reveals that principals commonly adopted committee system, preventive, emergency, condition-based, planned, and self-maintenance approaches to sustain school facilities. The study further shows no significant difference between urban and rural schools in maintenance practices, indicating a largely uniform maintenance culture across Plateau State. The study concludes that effective school plant maintenance depends more on systemic support than school location. It recommended strengthening preventive maintenance, improving government funding, enhancing principals' capacity, and fostering stakeholder participation.

Keywords: *School plant; Maintenance approaches; Principals; Secondary Schools; Urban–Rural; Plateau State*

Introduction

School plant is a critical component of educational administration and plays a significant role in the effectiveness of teaching and learning. It refers to all physical facilities and resources within the school environment, including classrooms, libraries, laboratories, workshops, playgrounds, furniture, equipment, and the general landscape that support the learning process (Undeshi, et al., 2018). These facilities provide the environment in which students learn and teachers carry out instruction. At the secondary school level, where the foundation for higher education and lifelong learning is laid, the availability and proper upkeep of these facilities are essential for quality education.

School plant maintenance involves all activities aimed at preserving, repairing, and ensuring the continued functionality of school facilities for effective instruction. Maintenance activities may include preventive care, repairs, replacement, or emergency interventions depending on the condition of the facilities (Clement, 2017). Effective maintenance guarantees safety, durability, and usability of resources, which in turn creates a conducive learning environment that enhances students' academic achievement. On the other hand, poorly maintained

facilities such as dilapidated classrooms, broken furniture, ill-equipped laboratories, and disorderly libraries can negatively affect teaching and learning outcomes. Students' academic achievement in Nigeria has remained inconsistent, particularly in core subjects such as Mathematics and English Language. Reports from examination bodies show fluctuating performance in national assessments. For example, Fapohunda (2023) asserted that In WAEC, 76.36% of candidates obtained credits in at least five subjects, including English and Mathematics, compared to 81.7% in 2021. Similarly, NECO (2022) noted that only 60.74% of candidates achieved five credits including Mathematics and English. These statistics suggest that while progress is being made, a significant proportion of students continue to perform below expectations. Scholars have linked such outcomes not only to personal factors like intelligence and motivation but also to institutional factors such as the availability and maintenance of educational facilities (Clement, 2017).

The problem of school plant maintenance in Nigeria is more pronounced in public secondary schools, many of which still rely on facilities constructed decades ago. In Plateau State, some school plants have undergone severe wear and tear due to prolonged use, overcrowding, and inadequate maintenance. In urban schools, although resources are relatively better provided, their maintenance is sometimes inconsistent. Conversely, rural schools often suffer from poor infrastructure, insufficient funding, and lack of maintenance, leaving students to learn in substandard environments. These urban-rural disparities in school plant provision and upkeep can contribute to differences in student outcomes (Takwate, 2018).

The role of the school principal is central in this context. As the chief administrator of the school, the principal is responsible for ensuring that facilities are properly maintained, utilized, and safeguarded to achieve educational objectives. Effective principals plan and adopt suitable maintenance approaches whether preventive, periodic, corrective, or emergency that ensures facilities remain functional and safe for use. However, evidence suggests that some principals lack awareness or commitment to these approaches, thereby allowing facilities to deteriorate and compromising the quality of education (Undeshi et al., 2018).

Recognizing the importance of educational facilities, the Federal Republic of Nigeria (FRN) (2013) has invested heavily in the provision of school plants through capital expenditure and interventions such as the Tertiary Education Trust Fund (TETFund). Despite these efforts, the challenge of inadequate maintenance persists, especially in Plateau State. The lack of empirical studies examining the specific maintenance approaches employed by principals, and how these approaches differ between urban and rural schools, creates a gap in knowledge. Addressing this gap is essential for improving the durability of school plants and the quality of teaching and learning in the state. This study therefore investigates the school plant maintenance approaches employed by principals of public senior secondary schools in Plateau State, with emphasis on the differences between urban and rural schools.

Purpose of the Study

The study aimed to examine school plant maintenance approaches of principals in public senior secondary schools in plateau state: urban and rural perspectives. The study focuses specifically on the following objectives:

1. Examine the types of approaches used in the maintenance of school plants in public senior secondary schools in Plateau State
2. Determine the school plant maintenance culture of urban and rural public senior secondary schools in Plateau State.

Research Questions

The following research questions guided the study:

1. What are the school plant maintenance approaches employed by principals of public senior secondary schools in Plateau State?
2. What is the difference between urban and rural public senior secondary schools in the mode of school plant maintenance in Plateau State?

Hypotheses

The hypotheses were formulated to be tested at a .05 level of significance:

1. There is no significant difference between the school plant maintenance in urban and rural public senior secondary schools in Plateau State.

Method of the Study

This study adopted a comparative survey research design, to examine the school plant maintenance approaches of principals in public senior secondary schools in Plateau State, with emphasis on differences between urban and rural schools. The design was considered appropriate because it enabled the researcher to gather data from a large population and compare responses across the two categories of schools without manipulating the variables under investigation. The population of the study comprised 320 public senior secondary schools in Plateau State, made up of 320 principals, 3,262 teachers, and 13,856 Senior Secondary School Three (SS III) students, giving a total population of 18,078 respondents across the 17 Local Government Areas. From this population, a sample of 1,744 respondents was selected, representing 10% of the population. The sample consisted of 32 principals, 326 teachers, and 1,386 students drawn from 32 schools across five Local Government Areas. This was considered adequate in line with the recommendation that 10–30% of a population is sufficient for survey research.

A multi-stage sampling technique was employed. First, five Local Government Areas were randomly selected from the 17 in the state, ensuring representation of both urban and rural settings. From these, 32 schools were proportionately drawn using stratified random sampling, with attention to urban–rural spread. Within the selected schools, principals, teachers, and students were randomly chosen to ensure representativeness. Two instruments were used for data collection. The first was the School Plant Maintenance Approaches Questionnaire (SPMAQ) developed by the researcher to elicit information on the strategies adopted by principals for maintaining classrooms, libraries, laboratories, workshops, and other facilities. It contained 37 items structured on a five-point Likert scale and focused on preventive, corrective, routine, and emergency maintenance approaches. The second instrument was the Document on School Maintenance Records (DSMR), which involved reviewing available school records on repairs, renovation, and maintenance activities to complement the questionnaire data. The validity of the SPMAQ was ensured through expert review by lecturers in Educational Management and Research, Measurement, and Evaluation, while construct validity was confirmed through factor analysis. Reliability was established through a pilot test using the Cronbach Alpha method, which yielded a coefficient of 0.73, indicating high internal consistency. The DSMR was considered valid since it consisted of official school records.

The researcher obtained permission from the principals of the selected schools and explained the purpose of the study to respondents. Questionnaires were administered through the direct delivery method with the assistance of five trained research assistants, who were briefed on proper administration and retrieval procedures. The DSMR was collected simultaneously with the questionnaires. Scoring of the SPMAQ was based on the Likert scale, with higher scores indicating greater use of effective maintenance approaches. Data collected were analyzed using both descriptive and inferential statistics. Frequencies, percentages, means, and standard

deviations were used to describe the extent and types of maintenance approaches. For decision-making, the criterion mean of 3.00 on the five-point Likert scale was adopted. A mean score of 3.00 and above indicated agreement on the use of a particular maintenance approach, while a mean score below 3.00 indicated disagreement. For percentage analysis, responses reaching 50% and above were regarded as substantial, while those below 50% were considered insignificant. Independent t-test was employed to compare the approaches of principals in urban and rural schools, while hypotheses were tested at a .05 level of significance.

Results and Discussion

Research Question 1: Examine the types of approaches used in the maintenance of school plants in public senior secondary schools in Plateau State.

Table 1: Approaches Used for Maintaining School Plant in Public Senior Secondary Schools in Plateau State

S/N	Approaches	n	\bar{X}	SD	Remark
1.	Committee System Approach	353	4.40	.77	Agreed
2.	Emergency Maintenance	353	4.28	.85	Agreed
3.	Condition-based maintenance	349	4.13	.89	Agreed
4.	Preventive maintenance approach	353	4.15	.95	Agreed
5.	Self-maintenance system	353	4.20	.85	Agreed
6.	Planned Maintenance	353	3.95	1.06	Agreed

Note: $\bar{X} < 3.0 =$ Disagreed and $\bar{X} > 3.0 =$ Agreed on 5-point Scale.

In Table 1, the results reveal that all the items were agreed upon because all the items had mean above the criteria mean of 3.00. The school plant maintenance approaches adopted by principals in public senior secondary schools in Plateau State include committee system approach, emergency approach, contract school plant maintenance approach, and condition-based maintenance approach. Other approaches commonly employed are preventive maintenance approach, planned maintenance and self-maintenance system which are highly practiced in public secondary schools in Plateau State.

Research Question 2: What is the difference between urban and rural public senior secondary schools in the mode of school plant maintenance in Plateau State?

Table 2: Mean Difference between Urban and Rural School Plant Maintenance

Group	N	\bar{X}	SD	Effect Size (η^2)	Decision
Urban	22	119.16	14.18	.020	Very small
Rural	10	119.86	13.81		

Table 2 indicates that urban schools had $\bar{X} = 119.16$ which is slightly lower than that of the rural schools which is $\bar{X} = 119.88$. The effect size is very small ($\eta^2 = .020$). This implies that the difference between urban and rural schools in the mode of school plant maintenance in Plateau State was very small.

Hypothesis 1: There is no significant difference between the school plant maintenance in urban and rural public senior secondary schools in Plateau State.

Table 3: Result of t-test Analysis for Difference between Urban and Rural School Plant Maintenance

Group	N	\bar{X}	SD	\bar{X} difference	df	t	p	Decision
Urban	22	119.16	14.18	.70	351	.38	.703	Accepted
Rural	10	119.86	13.81					

$P > .05$.

Data in Table 3 indicates that urban schools had $\bar{X} = 119.16$, while that of the rural schools is; $\bar{X} = 119.88$ with mean difference of .70. The p-value of .703 is greater than the .05 level of significance at 351 degrees of freedom. Consequently, the null hypothesis is accepted and rules that there is no significant difference between urban and rural schools' plant maintenance, $t(351) = .38$, $p = .703$. This implies that both urban and rural schools had similar school plant maintenance operations.

Discussion of Findings

The findings of this study revealed that principals in public senior secondary schools in Plateau State employ diverse approaches to maintain school plants. These include the committee system approach, emergency maintenance, condition-based maintenance, preventive maintenance, self-maintenance, and planned maintenance. The high mean scores across all items suggest that these approaches are commonly practiced and generally accepted by school administrators as effective strategies for keeping facilities functional. This aligns with the view of Clement (2017) that maintenance strategies are crucial for sustaining educational facilities and ensuring a conducive learning environment.

The result further shows that there was no significant difference between urban and rural schools in terms of school plant maintenance. Although rural schools recorded a slightly higher mean score than their urban counterparts, the effect size was very small, and the difference was not statistically significant. This implies that principals, irrespective of school location, adopt similar approaches to school plant maintenance. This finding corroborates the observation of Takwate (2018) that both urban and rural schools in Nigeria face similar infrastructural challenges such as inadequate funding, poor maintenance culture, and limited technical expertise. Thus, maintenance practices across schools are influenced more by systemic constraints than geographical location.

Conclusion and Recommendations

The study concluded that principals in public senior secondary schools in Plateau State adopt several approaches in maintaining school plants, including preventive, condition-based, emergency, committee system, planned, and self-maintenance strategies. These approaches are recognized as essential in sustaining facilities for effective teaching and learning. Importantly, the study found no significant difference between urban and rural schools in their maintenance practices, suggesting a uniform maintenance culture across the state. Effective school plant maintenance remains critical to improving the quality of education and enhancing students' achievement in both urban and rural schools.

Based on the findings, the following recommendations are made that:

1. *Strengthening Preventive Maintenance*: principals should prioritize preventive and planned maintenance over emergency interventions to reduce long-term costs and prevent facility deterioration.
2. *Increased Government Support*: the state government should allocate more funds specifically for school plant maintenance and ensure timely disbursement to both urban and rural schools.
3. *Capacity Development*: Training programmes should be organized for principals and school maintenance committees to enhance their skills in modern and sustainable maintenance practices.
4. *Stakeholder Participation*: principals should strengthen the committee system by involving teachers, parents, and community members to promote collective responsibility in maintaining school plants.
5. *Monitoring and Supervision*: the Ministry of Education should establish a periodic monitoring and evaluation mechanism to assess the state of facilities and ensure accountability in maintenance practices.
6. *Encouraging Self-Maintenance Culture*: schools should cultivate a culture where staff and students take responsibility for minor repairs and routine care of facilities to prolong their lifespan.

References

- Clement, W. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.)*. Sage publication.
- Fapohunda, T. (2022). *NECO releases SSCE results*. Punch Newspapers, August 1.
- Federal Republic of Nigeria (FRN). (2014). *National Policy on Education (6th ed.)*. NERDC press.
- Takwate, K. T. (2018). Allocation, availability and maintenance of school facilities as correlate of academic performance of senior secondary school in Anambra State, Nigeria. *International Journal Scientific and Research Publications*, 8(9), 81-102. Retrieved from: <http://dx.doi.org>.
- Undeshi, C. A., Asinde, A. A., Egbe, J., E. & Ogar, J. A. (2018). Impact of school plant planning and quality universal basic education programme in Obudu Local Government Area of Cross River State. *Nigerian Journal of Educational Administration and Practice*, 18(1), 67-90.
- West African Examinations Council. (2023). *Chief Examiners' Report*. WAEC.