

EXAMINING THE IMPACT OF SCHOOL PLANTS MAINTENANCE AND ACADEMIC ACHIEVEMENT IN PUBLIC SECONDARY SCHOOLS IN PLATEAU STATE, NIGERIA

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ABSTRACT

This study investigates the relationship between school plants maintenance and academic achievement in Plateau State, Nigeria. School plants, encompassing all physical amenities in a learning environment, are crucial for creating conducive spaces for teaching and learning. However, maintenance of these facilities is often overlooked, impacting student performance. This research aims to fill this gap by exploring the correlation between school plant upkeep and academic success. Students show good English and Mathematics proficiency and high classroom maintenance indicates dedication to providing learning spaces. The study found varying correlations between maintenance aspects and academic achievement, with classroom, library, and laboratory maintenance showing positive correlations. The study will adopt multi-stage sampling techniques. The data for this study were collected using two (2) instruments. The first instrument is titled, School Plant Maintenance Questionnaire (SPMQ), while the second instrument is titled Student Academic Achievement Proforma (SAAP). The instrument proposed for the study is the School Plants Maintenance Questionnaire (SPMQ) is valid and reliable and was used in the study. The study suggests several recommendations to improve the maintenance of school infrastructure in public senior secondary schools in Plateau State. These include investing in maintenance, providing training and capacity-building programs for staff, implementing regular inspections and monitoring to identify areas in need of repair, and fostering community engagement to encourage participation in maintenance activities and support for school maintenance initiatives. These measures aim to enhance the learning environment and academic achievement.

KEYWORDS: *Academic performance, school plant, academic achievement, school infrastructure, maintenance.*

INTRODUCTION

One of the key facets of school administration is the school plants, which refers to all the physical amenities found in a learning environment. On the other hand, school plant maintenance deals with the necessary upkeep of all the facilities found in a school. The term "school plant" refers to the facilities, furnishings, supplies, machinery, and other elements found on the school property. It consists of roads, trails, playgrounds, open spaces, trees, flowers, and other items that help or promote the academic success of the kids. According to Peter (2012), the school environment—which includes the buildings, furnishings, and textbooks—is referred to as the "school plant." Thus, the term "school plant" refers to all of the building's semi-permanent and permanent components. The term "school plant," as used in this study, refers to the availability of classrooms, libraries, labs, workshops, playgrounds, and furniture, all of which play a crucial role in enhancing the educational system across the board. As a result, maintaining school plants well may raise children's academic performance.

Even while academic achievement is substantially measured in education, particularly at the secondary school level, many exams and disciplines—particularly English language and mathematics—report dismal results. Of the 1,198,412 students who took the Senior School Certificate Examination (SSCE) in 2022, the National Examination Council (NECO) claimed that at least 727,864 (60.74%) received at least five credits, including English language and mathematics (Fapohunda, 2022a). The WAEC examination organization reports that of the 1,601,047 candidates who completed the 2022 exam, 1,222,505 (76.36%) received credits or above in at least five (5)

disciplines, including mathematics and English language. These figures show a five percent decrease in performance from the 81.7% pass rate that was reported in 2021 (Fapohunda, 2022b). Moreover, English Language and Mathematics were among the five (5) credits and above that 76.30% of the 25,915, total applicants who took the 2021 NABTEB exam received (NABTEB, 2022). According to the aforementioned data, even if many students find the results satisfying, many of them continue to fail arithmetic and English language, which should worry the public.

A student's academic performance is impacted by several internal and external factors, including their intelligence, health, motivation, and anxiety, among many others, and the availability of a conducive learning environment, adequate educational resources like textbooks, and well-stocked laboratories. Poor academic attainment has been ascribed by Clement (2017) to a confluence of institutional and personal variables. Individual intelligence, knowledge, and skill are examples of personal elements; school atmosphere, school plant, and educational infrastructure are examples of institutional factors. One typical indicator used to assess academic performance at any level of education is the school plant. It describes the physical space of the school, its structures, its playgrounds, its equipment, and other materials that are used to support efficient teaching and learning activities. The majority of the facilities and equipment included the following: the lab, workshops, play spaces, cafeteria, library, lighting, ventilation, floor, sports field, weather, and space allocated for each student. It is important to remember that while having a school plant is required, its ability to perform well depends on upkeep. Maintenance of school plants has emerged as a major concern for the majority of secondary schools. The upkeep of school plants has a significant impact on both staff professionalism and student academic achievement. When school plants are adequately maintained, high standards are reached in the classroom. In general, the goal of school plant maintenance is to create the best possible environment for teaching and learning. This is because students will be more motivated to learn to achieve better academically in a supportive and accommodating learning environment. Upkeep of the school grounds suggests that something is wrong with the structure, machinery, or landscaping and that they need to be fixed to get back to normal. The upkeep, replacement, and general repair of physical facilities as they relate to school buildings, grounds, and safety systems are the key objectives of school plant maintenance.

The major goals of school plant maintenance are to create a physically suitable and sufficient learning environment as well as to guarantee the safety of facility users, including students, teachers, parents, and guardians. All efforts made to maintain the original purpose and worth of the school plant are referred to as maintenance of the plant. Because adequate maintenance and utilization of the available structural units and facilities are essential to the functional and efficient functioning of the system, the majority of institutions base their basic operations on the management and upkeep of their school plants. Sadly, wear and tear is a common occurrence in public school buildings that were erected more than 50 years ago (Hamdallah, Ozovehe & Olanrewaju, 2013). This is because they need both small and large repairs. After all, they have been used excessively. Concerning secondary schools, the upkeep of school buildings includes the care of classrooms, libraries, labs, workshops, and principals' responsibilities and methods for maintaining the facilities.

The actual physical space used for instruction in formal education is called a classroom. Repairs, preservation, and prevention of physical sensory aspects including paint, color, furniture, lighting, space, and social context in the classroom are all part of classroom maintenance. Broken windows, furniture, and chairs that need to be repaired are frequent occurrences at the majority of Nigeria's public secondary schools. Most classroom walls are shattered, which gives the hazardous creatures a place to hide out. Certain classrooms have punched roofs or lack cement ceilings, floors, and roofs. Under these circumstances, students can not feel comfortable learning, which makes learning unproductive and might lead to distorted academic results. It is generally observed that when school administrators maintain their classrooms well, children's overall development in the affective, behavioral, and cognitive domains will improve.

The school's library serves as the hub of academic activities and is widely recognized as a peaceful, comfortable space where students can work freely and without interruption. Books, manuscripts, journals, and other recorded information sources are gathered together in libraries. For learning to take place effectively, the secure acquisition and preservation of books, images, journals, and creative works depends on library care. Unfortunately, the majority of these secondary school libraries in Nigeria are not kept up. The reference book collections that offer accurate information and the indexes that assist patrons in finding information in libraries and information centers are frequently disorganized. Poetry, novels, short tales, music scores, and photographs are among the rare creative works that are either destroyed by treatment, dusting, or being devoured by termites. Non-fiction works like history, biographies, and other factual reports, as well as periodicals like magazines, academic journals, and books released in series, are frequently not guarded. The accessibility, availability, and usability of library resources can all be negatively impacted by this neglect, which can also have an impact on students' academic performance.

A laboratory is a unique space that usually has burners, beakers, and other items needed for students to conduct experiments and finish practicals. Tables, sinks, beakers, chemicals, burners, reading and writing instruments, and other specimens available for experiments or practicals are all part of laboratory maintenance. These items may need to be secured, fixed, or replaced. Nevertheless, it is concerning how these secondary school labs are being maintained. Numerous research and art laboratories have fallen into disrepair. There have been instances of laboratories with swinging doors, shattered windows, and fractured walls that put students at risk when they are doing experiments or practicals. As a result, keeping laboratories for teaching and learning (complete with test tubes, atlases, beakers, and chemicals) in good condition can boost student interest, speed up the learning process, and raise academic accomplishment.

A room, collection of rooms, or structure that offers a workspace and the necessary equipment for performing labor, particularly mechanical work, is referred to as a workshop. The process of safeguarding, lubricating, maintaining, or swapping out tools (such as welding and fabrication) needed for the production or restoration of produced goods is known as workshop maintenance. The state of the fabrication tools and workshop supplies, including joinery, mechanical, and carpentry, in senior secondary schools is quite concerning. A large number of them require lubrication, repair, or replacement due to their corrosion. As a result, inadequate workshop upkeep in senior secondary schools may cause students to become less engaged, have trouble focusing, and do worse academically. When secondary school administrators correctly and consistently maintain the workshop, the equipment and facilities endure longer, saving the government money and raising academic achievement among the pupils.

The distribution and upkeep of school resources, in addition to workshop maintenance, may be impacted by the school's location. Due to scarce resources and growing student enrollment, rural schools face unique challenges. While the government and other groups, such as the Parents Teachers Association (PTA), offer metropolitan schools ample resources, rural schools receive little funding and poor maintenance. In cities with access to electricity, which promotes learning environments, enhances student performance, and improves the quality of education overall, most rural schools lack the distribution, use, and upkeep of this kind of school plant infrastructure, which has an impact on students' academic performance. In secondary schools, the principal or other school administrator is responsible for making sure that the school plant is properly maintained and used to achieve the desired learning outcomes. To stop infrastructural degradation from happening again, the principal must make sure that the resources or facilities required for effective and efficient teaching and learning are provided and maintained. Certain principals of secondary schools fail miserably in carrying out their duty of upkeep of the school infrastructure. These school administrators don't try to ensure that the school's facilities and overall environment are maintained in a way that facilitates successful teaching and learning. Maintaining school plants by administrative responsibilities may improve both the caliber of academic programs and student accomplishment.

Furthermore, there may be a favorable correlation between students' academic success and the maintenance strategies used by school principals to maintain the school's plants. Administrators must organize the program such that certain maintenance tasks are completed regularly, others periodically, and yet others when an emergency calls for them. A subset of secondary school principals lack knowledge regarding preventative, periodic, replacement, improvement, and emergency maintenance, as well as the purposes and consequences of these various maintenance services. Teachers' and students' ability to use school plants in a flexible and long-lasting manner may be ensured if school administrators have sufficient knowledge about these sorts of upkeep and apply them appropriately. Students will benefit from these initiatives by becoming more interested in studying and performing well academically in school.

Over time, the Federal Republic of Nigeria (FRN 2013) has acknowledged the value of educational facilities and school plants for the teaching and learning process. As a result, billions of naira were allocated annually for capital expenditures through the Education Trust Funds (ETF), resulting in the construction of numerous buildings at various educational levels. To provide high-quality service, the three levels of government and well-meaning Nigerians pledged to provide school plants. The creation, upkeep, and management of these educational establishments are crucial facets of the nation's public school system administration.

To the dismay of Nigerian educational planners, particularly in Plateau state, despite the government's strong commitment to developing school plants, the majority of the plants are woefully unsuitable for student use, and the ones that exist are badly cared for and preserved. For excellent teaching and learning efficacy, it is consequently necessary to make use of and maintain the limited plants and facilities available in schools. As of right now, no empirical study has been done in Plateau State, Nigeria, to determine the relationship between school plant upkeep and academic accomplishment. Therefore, the purpose of this study is to look at the connection between kids' academic success in Plateau State, Nigeria, and school plant care.

AIM AND OBJECTIVES OF THE STUDY

The study aims to examine school plant maintenance and students' academic achievements in public senior secondary schools in Plateau State, Nigeria. The study specifically focused on the following objectives:

1. Determine the level of senior secondary school student's academic achievement in Plateau State;
2. Find out the extent to which classrooms are maintained to improve the academic achievement of senior secondary school students in Plateau State;
3. Ascertain the extent to which libraries are maintained to enhance the academic achievement of senior secondary school students in Plateau State;

RESEARCH QUESTIONS

The following research questions were raised to guide the study:

1. What is the level of senior secondary school students' academic achievement in Plateau State?
2. To what extent are classrooms maintained in senior secondary schools in Plateau State?
3. To what extent are libraries maintained in senior secondary schools in Plateau State?

HYPOTHESES

The following null research hypotheses will be tested at a 0.05 level of significance:

1. There is no relationship between classroom maintenance and the academic achievements of secondary school students in Plateau State.
2. There is no significant relationship between library maintenance and the academic achievements of secondary school students in Plateau State.

3. There is no significant relationship between the maintenance of laboratories and the academic achievements of secondary school students in Plateau State.

METHODOLOGY

The study adopted the correlational survey design and Ex-post facto design, which blended quantitative and qualitative data to provide relevant and accurate information. The population for the study comprised all 320 public senior secondary schools, 320 principals, 3262 teachers, and 13,856 students in Plateau State, totaling 17,758 from 17 Local Government Areas. The sample was made up of 64 principals from 64 schools with 652 teachers and 2771 students, totaling 3,551 in secondary schools spread across the 5 Local Government Areas of Plateau State. The study employed multi-stage sampling techniques, including stratified and proportional stratified random sampling, to collect accurate and unbiased information about a large population from a small sample. The School Plant Maintenance Questionnaire (SPMQ) was used to measure the relationship between school plant maintenance and students' academic achievement. The study used two instruments: the School Plant Maintenance Questionnaire (SPMQ) and the Student Academic Achievement Proforma (SAAP), developed by the researcher. The SPMQ was used to measure the relationship between school plant maintenance and students' academic achievement, while the SAAP will was used to measure the relationship between school plant maintenance and students' academic achievement. The School Plant Maintenance Questionnaire (SPMQ) was developed by the researcher to gather information on the maintenance of school plants in Plateau State. The questionnaire was divided into two main sections, A and B, and will be rated on a five-point scale. It focused on aspects such as academic achievement, classroom maintenance, library maintenance, laboratory maintenance, workshops, principal roles, and maintenance approaches.

The Student's Academic Achievement Proforma (SAAP) was used to gather data on the number of credit passes obtained by students in five subject areas in WAEC examination results for four years (2019-2022) in senior secondary schools. The instrument was developed based on the study's aim, objectives, research questions, and hypotheses. The construct validity was established using the factor analysis method, which reduces the multiplicity of tests and measures to a greater simplicity. The SPMQ was developed by the West African Examination Council (WAEC) and is considered valid and reliable in Nigeria and West Africa. Reliability was measured by administering the instruments to a sample of 52 respondents from selected government secondary schools in Langtang South Local Government Area of Plateau State. The Cronbach Alpha method was used to measure the internal consistency of the reliability. A reliability coefficient of 0.70 indicates that the instrument is reliable for the study. The SPMQ and SAAP were used to gather data on the maintenance of school plants in Plateau State. A questionnaire was administered to their respective schools using the direct delivery method (DDT). Assistants were trained in distributing questionnaires, checking responses, and retrieving completed questionnaires. The School Plant Maintenance Questionnaire (SPMQ) was scored using a 5-point Likert scale. The data analysis used frequency count and percentage, with Pearson Product Moment Correlation to test hypotheses at a 0.05 level of significance. Hypotheses with a P-value less than 0.05 were rejected, while those with a P-value greater than 0.05 were accepted.

RESULTS AND DISCUSSION

Research Question One: What is the level of public senior secondary students' academic achievement in Plateau State?

Table 1: Results of the Analysis on Level of Students' Achievement in Public Senior Secondary Schools in Plateau State

Subjects	N	$\bar{X}$	SD	Level
Mathematics	100	67.30	15.47	High
English Language	100	63.44	13.82	

The results of the analysis from Table 1 reveal the performance of students in Mathematics and English Language. From the results, students' performance in Mathematics is $\bar{X} = 67.30$, $SD = 15.47$ while performance in English Language is $\bar{X} = 63.44$, $SD = 13.82$. The results indicate that the performance of students in Mathematics was higher than the performance in the English language. The results further indicate that students' performance in the two subjects was high.

Research Question Two: To what extent are classrooms maintained in public senior secondary schools in Plateau State?

Table 2: Results of Analysis on the extent to which Classrooms are Maintained in Public Senior Secondary Schools in Plateau State

S/N	Statement	N	$\bar{X}$	SD	Decision
1.	Damaged roofs are repaired to prevent eventual total breakdown in my school.	100	4.70	.49	Accept
2.	Damaged windows are repaired to prevent eventual total breakdown in my school.	100	4.47	.65	Accept
3.	Boards are well maintained in my school.	100	4.25	.78	Accept
4.	Chairs are well maintained in my school.	100	4.05	1.03	Accept
5.	Tables are well maintained in my school.	100	4.02	1.07	Accept
6.	Desks are well maintained in my school.	100	4.16	.95	Accept
7.	Maintenance of school furniture will stimulate students' interest to study.	100	4.07	1.08	Accept
8.	Maintenance of school furniture will improve students' achievement.	100	4.22	.88	Accept
9.	Poor maintenance of furniture will cause congestion.	100	4.02	.93	Accept
10.	Poor maintenance will affect the school's overall performance.	100	4.14	.98	Accept
Total			4.20	0.99	Accept

The results of the analysis from Table 2 reveal that all items were accepted because the items had a mean above the criteria mean of 3.00. This implies that damaged roofs are usually repaired before they are broken down, damaged windows are usually repaired, boards are well maintained, chairs are usually maintained, tables are usually maintained, desks are usually well maintained, maintenance of school furniture stimulates students' interest to study, maintenance of school furniture improve students' achievement, poor maintenance of furniture cause congestion and poor maintenance affects school overall performance. The results further indicate an overall mean of 4.20 which indicates an overall mean of 4.20 which indicates a high level of classroom maintenance. This implies that there is a high level of classroom maintenance in Plateau State.

Research Question Three: To what extent are libraries maintained in public senior secondary schools in Plateau State?

Table 3: Results of the Analysis of Extent of Libraries Maintenance in Public Senior Secondary Schools in Plateau State

S/N	Statement	N	$\bar{X}$	SD	Decision
1.	Maintenance of the library makes it possible for current books to be available for students to study widely.	100	4.31	.86	Accept
2.	Maintenance of the library facilities helps students to study effectively.	100	4.25	.74	Accept
3.	Pirated books are rebound for effective use.	100	4.17	.91	Accept
4.	Internet library is effective in the school.	100	3.39	1.14	Accept
5.	Leaked sections of the library are usually repaired on time.	100	3.69	.98	Accept
6.	Bookshelves are repaired regularly to protect books from damage.	100	2.94	1.11	Reject
7.	Most books are maintained in the school on a yearly basis.	100	4.14	.98	Accept
Total			3.84	0.96	Accept

The results of the analysis from Table 3 reveal that items 1, 2, 3, 4, 5, and 7 were accepted because the items had a mean above the criteria mean of 3.00. This implies that maintenance of the library makes of possible for current books to be available for students to study widely, maintenance of the library facilities helps students to study effectively, pirated books are rebounded for effective use, internet library is effective in schools, leaked sections of the library are usually repaired on time, and most books are maintained in the schools yearly. While item 6 was rejected because the item had a mean below the criteria mean of 3.00. This implies that bookshelves are not usually repaired regularly to protect books from damage. The overall mean is 3.87 with a standard deviation of 0.96. This implies that books are maintained at a moderate level in the study area.

Hypotheses Testing

Hypothesis One: There is no significant relationship between classroom maintenance and the academic achievement of public senior secondary school students in Plateau State.

Table 4: Results of the Pearson r Analysis on the Relationship between Classroom Maintenance and Students' Academic Achievement

Group	N	$\bar{X}$	SD	r	P-Value	Decision
Classroom maintenance	100	42.16	5.81	.911	.0011	Reject
Students' academic achievement	100	56.12	16.97			

The results of the analysis from Table 10 revealed that classroom maintenance had a mean score of 42.6, SD = 5.81 while academic achievement had $\bar{X}$ = 56.12, SD = 16.97. The result indicates $r(95) = 0.911$, $P < 0.011$. Since the P-value of 0.011 is less than the significance level of 0.05. We reject the null hypothesis and conclude that there is a significant positive relationship between classroom maintenance and the academic achievement of students in this study. This implies that classroom maintenance helps to improve the academic achievement of students.

Hypothesis Two: There is no significant relationship between library maintenance and academic achievement of public senior secondary school students in Plateau State.

Table 5: Results of the Pearson r Correlation between Library Maintenance and Academic Achievement of Students

Group	N	$\bar{X}$	SD	r	P-Value	Decision
Library maintenance	100	26.01	4.12	.682	0.041	Reject
Academic achievement	100	56.12	16.97			

The results of the analysis from Table 11 revealed that library maintenance had a mean score of 26.61, SD = 4.12 while academic achievement had $\bar{X}$ = 56.12, SD = 16.97. The results indicate that $r(95) = 0.682$, $P < 0.05$. Since the P-value of 0.041 is less than the significance level of 0.05, we reject the null hypothesis and conclude that there is a significant moderate positive relationship between library maintenance and academic achievement of senior secondary school students. Hence, the maintenance of school libraries is related to students' academic achievement in secondary schools in Plateau State.

Hypothesis Three: There is no significant relationship between the laboratory maintenance and academic achievement of public senior secondary school students in Plateau State.

Table 6: Results of the Pearson r Correlation between Laboratory Maintenance and Academic Achievement of Students

Group	N	$\bar{X}$	SD	R	P-Value	Decision
Laboratory maintenance	100	21.64	5.25	.54	0.000	Reject
Academic achievement	100	56.12	16.97			

The results of the analysis from Table 12 showed that laboratory maintenance had a mean score of $\bar{X} = 21.64$, SD = 5.25 while academic achievement had $\bar{X} = 56.12$, SD = 16.97. The results indicate $r(95) = 0.54$, $P < 0.05$. Since the P-value of 0.000 is less than 0.05, we reject the null hypothesis and conclude that there is a significant positive relationship between laboratory maintenance and the academic achievement of senior secondary school students. This implies that there is a significant correlation between laboratory maintenance and students' academic achievement in the study area.

CONCLUSION

The study examines academic performance and school infrastructure maintenance in public senior secondary schools in Plateau State. Students show good English and Mathematics proficiency and high classroom maintenance indicates dedication to providing learning spaces. Moderate maintenance in libraries, laboratories, and workshops needs improvement. The study found varying correlations between maintenance aspects and academic achievement, with classroom, library, and laboratory maintenance showing positive correlations. Principals' role in maintenance and the choice of maintenance approach also impact student success. The findings emphasize the importance of comprehensive maintenance practices and effective leadership in fostering academic excellence.

RECOMMENDATIONS

Based on the findings of this study, several recommendations can be made to enhance the maintenance of school infrastructure and further improve academic achievement in public senior secondary schools in Plateau State:

1. **Investment in Maintenance:** Allocate sufficient resources and funding towards the maintenance of school infrastructure, particularly in libraries, laboratories, and workshops. This investment will ensure that these facilities are adequately equipped to support teaching and learning activities.
2. **Training and Capacity Building:** Provide training and capacity-building programs for school staff, especially maintenance personnel, and principals, on effective maintenance

practices and strategies. This will enable them to carry out their responsibilities more efficiently and ensure the longevity of school facilities.

3. **Regular Inspection and Monitoring:** Implement a system of regular inspection and monitoring to assess the condition of school infrastructure and identify areas in need of maintenance or repair. This proactive approach will help prevent the deterioration of facilities and maintain a conducive learning environment for students.
4. **Community Engagement:** Foster collaboration and engagement with the local community to garner support for school maintenance initiatives. Encourage community members to participate in maintenance activities and take pride in the upkeep of their local schools.

By implementing these recommendations, stakeholders can work together to enhance the maintenance of school infrastructure and create an environment that supports academic excellence and student success in public senior secondary schools in Plateau State

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