

INFLUENCE OF SCHOOL PLANT MANAGEMENT ON STUDENTS' ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOL, DUTSINMA METROPOLIS KATSINA STATE

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Abstract

The study investigated the Influence of School Plant Management on Students' Academic Performance in Public Senior Secondary Schools in Dutsin-Ma Metropolis, Katsina State. The study was guided by two objectives, and two research questions. The study adopted descriptive survey research design. The population of the study was 4,109. This comprises of principals 10, teachers 1,500 and 2,509 students of public senior secondary schools in Dutsin-Ma Metropolis. The sample for the study was 380 according to Krejcie and Morgan Table. Academic Performance Questionnaire (SPMSAPQ) was used and validated by two experts in the Department of Educational Management and Measurement and Evaluation Unit, with reliability Coefficient of 0.88, after a study was carried out. The research questions were answered using descriptive statistics of mean and standard deviation. The findings of the study revealed that the management school plants significantly influence students' academic performance in public secondary schools in Dutsin-Ma Metropolis, Katsina State. The study concluded that laboratory management has a strong influence on students' academic performance in public secondary schools in Dutsin-Ma Metropolis, Katsina State. Based on the findings, the study recommended among others that the Katsina State Ministry of Education should provide additional classrooms, renovate dilapidated structures, and ensure proper classroom maintenance in order to create a conducive learning environment and reduce overcrowding in public secondary schools.

Keywords: School Plant, School plant management, academic performance.

Introduction

Education is universally acknowledged as the backbone of national development, as it equips individuals with knowledge, skills, and values needed to contribute meaningfully to society. According to (Okebukola, 2021) education is also seen as a tool for social mobility, empowerment, and economic growth. However, for education to achieve its desired goals, there must be an enabling environment that supports effective teaching and learning (FRN, 2014). One of the most important measures of the effectiveness of education is students' academic performance, which reflects how well learners achieve the intended learning outcomes (UNESCO, 2020). Academic performance does not depend solely on teachers or curriculum but it's also shaped by the availability and quality of physical facilities within the school environment (Earthman, 2016). Among the numerous facilities, classrooms and laboratories stand out as the most critical to the teaching and learning process in secondary schools.

Classrooms are the central spaces where teaching and learning activities occur. They are the physical structures in which teachers deliver lessons and students receive instruction. According to Nwagwu (2010), classrooms serve as protective environments that shield learners from external conditions such as rain, wind, and heat, while also providing a safe and controlled

space for instruction. The adequacy, condition, and arrangement of classrooms therefore have a direct impact on the quality of learning and students' academic outcomes. Well-ventilated classrooms with adequate seating, good lighting, and sufficient space enhance concentration, foster active participation, and improve comprehension. On the contrary, overcrowded and poorly maintained classrooms often create discomfort, limit interaction, and hinder the learning process. Fenker (2014) observed that classrooms in good condition improve the teacher's effectiveness and student's achievement, while inadequate classrooms contribute to distractions, absenteeism, and poor performance.

The physical layout and general condition of classrooms also shape students' behavior and attitudes toward learning. Research evidence indicates that when classrooms are neat, spacious, and conducive, students develop positive attitudes toward schooling, pay more attention in class, and engage more actively in academic activities (Joe, Kpolovie, Osonwa, & Iderima, 2014). However, in many Nigerian public secondary schools, including those in Dutsin-Ma Local Government Area, classrooms are often overcrowded due to rising student enrollment and limited government investment in infrastructure. In some schools, classrooms are dilapidated, with leaking roofs, broken walls, and inadequate furniture. These conditions make it difficult for teachers to deliver lessons effectively and for students to learn productively, thereby affecting academic performance.

In addition to classrooms, laboratories play a central role in enhancing students' academic achievement, especially in science-related subjects such as Biology, Chemistry, and Physics. Laboratories provide an environment for practical learning, where students conduct experiments, test theories, and apply classroom knowledge in real-life contexts. Hofstein and Lunetta (2014) emphasized that laboratories are indispensable in science education because they promote inquiry, problem-solving, and critical thinking skills. By engaging students in hands-on learning, laboratories deepen understanding, improve retention, and build students' confidence in applying scientific concepts. Morohunfola (2015) also observed that students exposed to laboratory experiences demonstrate higher achievement in science subjects compared to those taught only through theoretical methods.

Well-equipped laboratories also stimulate students' interest in science and technology, encouraging them to pursue careers in related fields. They promote collaborative learning, as students often work together in groups to carry out experiments, thereby developing teamwork and communication skills. However, when laboratories are poorly equipped or entirely absent, as is the case in many Nigerian schools, teachers are compelled to adopt purely theoretical approaches in teaching science subjects. This limits students' exposure to scientific inquiry, reduces their motivation, and ultimately hinders their academic performance (Onuorah & Nwankwo, 2022).

Unfortunately, infrastructural challenges remain a major issue in Nigerian secondary schools. Many laboratories lack basic equipment such as microscopes, reagents, and test tubes, while others are housed in buildings that are in poor condition. In some schools, students are taught science without ever entering a laboratory, depriving them of the opportunity to learn through practice. Similarly, many classrooms are either too few to accommodate the growing population of students or are in a dilapidated state. This situation undermines the teaching-learning process and contributes to the generally low academic performance reported in many public schools.

Specifically, in Dutsin-Ma Local Government Area of Katsina State, public secondary schools face challenges related to classrooms and laboratories. Many of the classrooms are overcrowded, with students sitting on broken chairs or on the floor, while some classes take place under trees due to inadequate classroom space. Science laboratories, where they exist, are poorly equipped, limiting the ability of teachers to conduct experiments effectively. These challenges create a learning environment that is far from ideal and pose significant obstacles to students' academic achievement.

Given the centrality of classrooms and laboratories to the teaching–learning process, it becomes imperative to investigate their influence on students' academic performance in public secondary schools. By focusing specifically on these two critical facilities, this study seeks to provide empirical evidence on how infrastructural conditions affect learning outcomes. The findings of the study are expected to inform policymakers, school administrators, and education stakeholders in making informed decisions regarding resource allocation, infrastructural development, and policy reforms that will enhance the quality of education in Dutsin-Ma Local Government Area and Nigeria as a whole.

Statement of the Problem

School plant is the physical environment in which teaching and learning take place. It includes the school site, buildings, classrooms, furniture, equipment, and other facilities. The school plant plays an important role in student academic performance, as it can provide a supportive and conducive learning environment and it can hinder learning. In Dutsin-Ma Metropolis of Katsina State, Nigeria, many secondary schools have inadequate school plant facilities. This includes classrooms that are overcrowded and poorly ventilated, laboratories that are lacking in essential equipment. Many schools lack basic amenities such as clean water and sanitation facilities. The poor state of the school plant in Dutsin-Ma Metropolis has a negative impact on students' academic performance. Students who learn in overcrowded and poorly ventilated classrooms are more likely to experience fatigue and difficulty concentrating. Students who do not have access to well-equipped laboratories are limited in their ability to learn science and other subjects effectively. And students who lack access to clean water and sanitation facilities are more likely to get sick, which can also disrupt their learning. The influence of school plant on student academic performance in secondary schools in Dutsinma Metropolis of Katsina State is a serious problem that needs to be addressed. This is by improving the school plant infrastructure and providing students with the facilities they need to learn; the government and other stakeholders can help to improve student academic performance and outcomes, hence the researcher worked on “The influence of school plant management on students' academic performance in public secondary school, Dutsin-ma”.

Objectives of the Study

The main objective of the study was to investigate the influence of school plant management on students' academic performance in secondary schools in Dutsin-ma Metropolis of Katsina State. Specifically, the study sought to:

1. Examine the influence of classroom management on students' academic performance in public secondary schools in Dutsin-Ma Metropolis of Katsina State.
2. Assess the influence of laboratory management on students' academic performance in public secondary schools in Dutsin-Ma Metropolis of Katsina State.

Research Question

The following research questions guided the study:

1. What is the influence of classroom management on students' academic performance in public secondary schools in Dutsin-ma Metropolis of Katsina State?
2. What is the influence of laboratory facility on students' academic performance in public secondary schools in Dutsin-Ma Metropolis of Katsina State?

Conceptual Framework

School Plants

School Plant is regarded as the general or overall equipment and facilities that enhances both teaching and learning. Isaac and Musibau (2010) states that school plant is the process of identifying appropriate sites and developing classroom spaces, administrative spaces, circulation spaces, and recreational places to enhance teaching and learning activities in a school system. Thus, the school plant reflects the integration of the components that constitute the school a system. Osahon (2001) presents a more extensive list of educational facilities, which may be divided into the following categories:

- (1) School building: A physical structure utilized for educational purposes. Classrooms, labs, workshops, common areas/teachers' offices, restrooms, common rooms, study rooms, pharmacy, library, dormitories/dormitories, canteen, auditorium, and staff housing are among them.
- (2) School equipment refers to objects or expenditures such as machinery and tools that aid in the operation of learning activities. Other tools are necessary.
 - (a) Desks, chairs, chalkboard, cabinets, shelves, dust, sinks, napkins, and school supplies are some examples.
 - (b) Laboratory: physics, chemistry, biology, agricultural sciences, home economics, foreign languages, and geography, for example. School plant planning is an idea.

School Plant Planning: School plant planning involves all the activities of educational planners, architects, civil engineers and others who produce everything necessary to build a school for teaching and learning. Adeyemi (2006) defines school plant planning as the process of managing, constructing, operating and maintaining school facilities to ensure the achievement of objectives. This approach is also consistent with that of Undie (2007), who describes school building as a conscious decision-making process of allocation, use and maintenance of these facilities to maximize their utility and extend their lifespan. It is also described as an on-going process that seeks to make optimal use of educational resources to achieve desired educational goals.

Importance of School Plants

According to Oyesola (2007), the following are instances of the value of school plants:

- i. Improved school amenities boost student achievement. Schools with decent pupils in standard classrooms that are free of noise and danger boost student success;
- ii. Improved school amenities boost student attendance;

- iii. Students are drawn to schools with superior school facilities, clean and beautiful middle schools with flowers, and recreational facilities;
- iv. School facilities improve teacher retention. A welcoming and roomy setting reduces teachers' workload (stress) and encourages them to work and stay in school; and
- i. Plants in schools increase students' attitudes toward learning. School plants offer a welcoming learning atmosphere that supports and encourages both instructors and kids to study. Implementing appropriate facilities encourages learning in classrooms and throughout the school.

Positive Influences of a Good School Plant

- i. **Enhances Learning Environment:** A well-designed and properly maintained school plant creates a safe, welcoming, and stimulating environment that boosts both student and teacher morale and encourages active learning.
- ii. **Boosts Academic Performance:** Adequate instructional facilities, such as classrooms with proper ventilation, libraries, and science labs, are crucial for effective teaching and learning, directly contributing to higher academic performance.
- iii. **Increases Attendance:** Superior facilities and a pleasant environment, including clean and beautiful middle schools with recreational areas, can attract and retain students, leading to improved attendance rates.
- iv. **Improves Information Literacy:** Well-equipped libraries contribute significantly to students' academic success by helping them develop essential information literacy skills to locate, evaluate, and use information effectively.
- v. **Promotes Safety and Well-being:** School plants provide a physically and psychologically safe space for students and teachers, ensuring a sense of security that is essential for effective learning and program delivery.

Methodology

Research Design

The study adopted a survey research design. This design was considered appropriate because it helps in describing existing conditions and events in their natural settings. The population of the study consisted of 4,109 respondents, comprising principals, teachers, and students from all the 20 public senior secondary schools in Dutsin-Ma Local Government Area. A total of 350 respondents were selected from the population of 4,109 using the stratified random sampling technique. The instrument used for data collection was the School Plant Management and Students' Academic Performance Questionnaire (SPMSAPQ). The instrument was validated by two experts from the Department of Educational Management and Test, Measurement and Evaluation Unit, Federal University Dutsin-Ma. The reliability of the instrument was determined using the test-retest method, and the data obtained was analyzed using Pearson Product Moment Correlation, yielding a reliability coefficient of 0.88. The research questions were answered using mean and standard deviation. An interpretive benchmark of 2.50 was established for the outcomes, consistent with common practices in educational research, where a mean score of 2.50 on a 4-point Likert scale is typically considered the threshold for agreement or significance (Boone & Boone, 2012; Agwu & Kalu, 2015).

Research Question One: What is the influence of classroom management on students' academic performance in public secondary schools in Dutsin-Ma Metropolis of Katsina State?

Table1: Responses of the respondents of the influence of classrooms management on academic performance of students

S/N	ITEMS	Mean (\bar{x})	SD	REMARK
1.	There are enough classrooms for learning	2.25	.50	Disagree
2.	The capacity of the classrooms is proportionate to the number of students.	2.42	.56	Disagree
3.	The class rooms are well located for quick accessibility	2.71	.65	Agree
4.	The classrooms are well ventilated	2.68	.64	Agree
5.	The classrooms are in good conditions	2.48	.57	Disagree
6	The environment is well conducive	2.75	.66	Agree
7.	The Aesthetic condition of the environment is conducive for learning.	2.68	.64	Agree
8.	Overcrowded classrooms can cause low academic performance	3.16	.78	Agree
9.	Sitting positions are adequately arranged so as to influence the academic performance.	2.51	.58	Agree
	There is adequate health facility.			

Table 1 shows that items 3, 4, 6, 7, 8, and 9 had mean scores above the decision benchmark of 2.50. This implies that respondents were of the opinion that classrooms in the study area are fairly well located for accessibility, ventilated to some extent, and that the learning environment is relatively conducive. They also indicated that classrooms are maintained to encourage learning that adequate sitting arrangements are made to influence academic performance, and that overcrowding negatively affects students' performance. However, items 1, 2, and 5 had mean scores below the benchmark of 2.50, showing that respondents disagreed that classrooms are sufficient, of good size, or in good building conditions. From the responses of the respondents, one can deduce that classroom management has a moderate positive influence on students' academic performance in public secondary schools in Dutsin-Ma Metropolis. This conclusion is supported by the overall decision mean score of 2.71.

Research Question Two: What is the influence of laboratory management on students' academic performance in public secondary schools in Dutsin-Ma Metropolis of Katsina State?

Table 2: Responses of the respondents of the influence of laboratory management on the academic performance of students’

S/N	ITEMS	Mean (\bar{x})	SD	REMARK
1.	A well-planned science laboratory with facilities influences teaching and learning of science	3.02	.74	Agree
2.	A well-stocked laboratory equipment and chemicals enhance science teaching and learning	3.05	.75	Agree
3.	Inadequate of laboratory maintenance will have influence on teaching and learning of science subjects.	3.07	.75	Agree
4.	Absence of science laboratory in schools will have influence on and teaching learning of science subjects	2.82	.68	Agree
			.72	Agree
5.	Regular repair of laboratory and provision of chemicals and equipment improve students’ academic performance.	2.96		
6.	Adequate supervision and guidelines during laboratory session enhances academic performance	2.97	.72	Agree
7.	Access to modern laboratory equipment and technology will influence the academic performance	2.85	.69	Agree
8.	Adequate supply of electricity enhances students’ academic performance.	3.16	.78	Agree
9.	The cleanliness of the laboratory environment contributes to a positive learning atmosphere.	3.07	.75	Agree
10.	The school laboratories are adequately reticulated with water.	2.45	.57	Disagree

Table 2 shows that items 1, 2, 3, 4, 5, 6, 7, 8, and 9 had mean scores above the decision benchmark of 2.50. This implies that respondents agreed that a well-planned science laboratory stocked with relevant chemicals and equipment enhances teaching and learning, that poorly planned and dilapidated laboratories negatively affect performance, that damage to laboratory facilities reduces learning quality, and that the absence of laboratories in schools undermines academic achievement. Furthermore, respondents indicated that regular repair and provision of facilities, adequate supervision during laboratory sessions, access to modern equipment, good lighting, and cleanliness of the laboratory all contribute positively to students’ performance. However, item 10 had a mean score below 2.50, showing that respondents disagreed that school laboratories are adequately reticulated with water. From these findings, it can be inferred that laboratory management strongly influences students’ academic performance in public secondary schools in Dutsin-Ma Metropolis. This conclusion is supported by the overall decision mean score of 2.95.

Discussion of Findings

The finding on research question one revealed that classroom management has a mixed but generally positive influence on students' academic performance in public secondary schools in Dutsin-Ma Metropolis, Katsina State. This finding aligns with the work of Adeyemi (2010), who found that effective classroom organization, including adequate space and proper seating arrangements, significantly improves students' concentration and learning outcomes. Similarly, Yusuf and Adigun (2010) emphasized that overcrowded and poorly maintained classrooms negatively affect students' academic performance in Nigerian secondary schools. The current study therefore corroborates earlier findings that while classroom management practices play a crucial role in fostering learning, infrastructural deficiencies in Nigerian schools continue to pose serious challenges.

The finding on research question two revealed that laboratory management strongly influences students' academic performance in public secondary schools in Dutsin-Ma Metropolis, Katsina State. This finding is consistent with the work of Ezeudu and Obi (2013), who established that well-managed laboratories significantly improve students' academic performance in science subjects in Nigerian schools. In the same vein, Oludipe (2012) noted that practical exposure in well-equipped laboratories enhances students' mastery of scientific concepts and boosts their achievement levels. The present study thus supports earlier evidence that laboratory management is crucial in determining students' academic success, especially in science-related disciplines.

Conclusion

Based on the findings, the study concluded that classroom management significantly influence the students' academic performance in public secondary schools in Dutsin-Ma Metropolis, Katsina State. Lastly the study also concluded that laboratory management has a strong influence on students' academic performance in public secondary schools in Dutsin-Ma Metropolis, Katsina State.

Recommendation

Based on the findings and conclusions of this study, the following recommendations were made:

1. The Katsina State Ministry of Education should provide additional classrooms, renovate dilapidated structures, and ensure proper classroom maintenance in order to create a conducive learning environment and reduce overcrowding in public secondary schools.
2. Government and stakeholders in education should adequately fund and equip science laboratories with modern facilities, constant water supply, and reliable electricity to enhance teaching and learning in science-related subjects.

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