

School Plant and Students' Academic Performance in Public Secondary Schools in Umuahia Educational Zone, Abia State Nigeria

David Onyemaechi Ekeh, Aloysius Orogwu Alo, Caroline O. Nweke, Laetitia Ugochi Nnadede
Department of Educational Management and Foundational Studies,
Faculty of Education,
Alex Ekwueme Federal University, Ndufu-Alike Ikwo, Ebonyi State,

ABSTRACT

This study investigated the relationship between school plant and students' academic performance in public secondary schools within the Umuahia Educational Zone of Abia State, Nigeria. The research was guided by two research questions and two null hypotheses. A descriptive survey design was adopted, utilizing random sampling techniques. The study population comprised all 46 public secondary schools in the zone, with a total of 3,300 Senior Secondary School II (SS2) students (SEMB, 2022). A sample of 345 respondents was selected using Taro Yamane's formula. Data were collected through a researcher-developed questionnaire, which was duly validated. The reliability of the instrument was established using Cronbach's alpha, yielding a coefficient of 0.79. The questionnaire was administered and retrieved by the researcher with the assistance of five research assistants, achieving a response rate of 98.3%. Mean and standard deviation were used to analyze the research questions, while the t-test was employed to test the hypotheses at the 0.05 level of significance. Findings revealed that the availability and adequacy of school plant facilities, such as classrooms and laboratories, significantly influence students' academic performance. Based on these findings, the study recommended, among other things, that the government and school administrators prioritize investment in improving school infrastructure and resources in public secondary schools within the Umuahia Educational Zone.

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INTRODUCTION

Education is seen as machinery for development process for producing positive change in that society, so the fundamental purpose of the teaching and learning process is to bring about desirable change in behavior through critical thinking in the learner. Teachers and school administrators must have access to the necessary material and physical resources to support teaching and learning in order to achieve the secondary education aim. These materials are referred to as school plants. It has been frequently discovered that the level and quality of the educational system are positively correlated with educational facilities like school plants (Ojedele,

2013). Nigeria as a country aspires to achieve true progress and development, which calls for a well-defined development plan that permits the full use of the resources provided by the educational system. According to Oluchuckwu (2010), these resources include the many school physical amenities that are essential to the educational process.

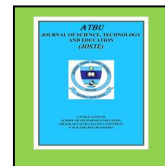
The term school plant refers to a controlled setting that supports the teaching and learning process while also guaranteeing the physical protection of students and faculty at an educational institution. It includes classrooms, libraries, labs, football fields, generators, restrooms, furnishings, and other goods related to

Corresponding author: David Onyemaechi Ekeh

✉ davidonyemaechi@gmail.com

Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo, Ebonyi State.

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the buildings, such as appliances and electrical wiring. It encompasses all of the buildings, features, and other components found on school grounds. School facilities and their surroundings must be aesthetically pleasing because the school environment is particularly important for students, especially those who are just starting to attend and because the formative years of a child's life can have a significant impact on their learning disposition (Mark, 2015). The features of the learning environment, the size of the classroom and school facilities, and the range and amount of tools and resources available all have an impact on the quality and approach of teaching and learning. The range of outdoor learning and leisure activities that are allowed at the school is significantly impacted by the size and features of the school site, as well as the school building and any supporting structures. Educational institutions are essential for the advancement of cognitive domains, competencies, and skills requisite for academic achievement (Abdulkarim, 2014). They are also essential for fostering social interaction sensitivity, commitment, positive emotions, and values in children. The school facility is used to provide a safe, secure, clean, and comfortable environment for students, as well as an effective atmosphere for teaching and learning. The size and features of the school sites, which is located outside the school building and other amenities, have a significant impact on the range of outdoor learning and leisure activities that are allowed at the school.

In addition to providing children with a safe, hygienic, and comfortable environment, the school's facilities help improve instruction and learning (Nworgu, 2015). The physical manifestation of the curriculum in the school's infrastructure either supports or undermines the institution's educational goals, hence the appropriateness, sufficiency, and relevance of these facilities may have an impact on the educational goal. A vital objective for any country is the construction of educational facilities to increase access to education. This has led to a thorough and careful examination of every aspect relevant to nation-building, including the function of the educational system, economic tactics, and

demographic trends. Rao (2014) contends that education fosters individual creativity, improves social engagement, and facilitates a more substantial contribution to human growth. Thus, the availability of educational facilities is a result of access to education and, thus, a reflection of a nation's progress. The school building holds a crucial role in the development and functioning of the educational system at all levels. School plant planning is the procedure by which architects create educational facilities to fulfill the pedagogical criteria set forth by professional educators or planners. A well-designed school facility would enhance expected educational outcomes, facilitating students' academic progress in a manner conducive to economic, political, and social emancipation. According to Rao (2014), education increases social participation, encourages individual creativity, and makes a bigger contribution to human development possible. Therefore, access to education leads to the availability of educational facilities, which in turn reflects the advancement of a country. The construction and operation of the educational system at all levels depend heavily on the school building. The process by which architects design educational facilities to meet the pedagogical standards established by qualified educators or planners is known as school plant planning. Only when staff and students are protected from man-made and natural hazards does the educational process have any value.

A well-designed school building would improve the desired educational outcomes and help pupils advance academically in a way that promotes social, political, and economic emancipation, hence the school plant is therefore a crucial component of instructional planning. The suitability of the schools determines how well buildings may be constructed in an environment that improves performance. According to Arowojolu (2014), without sufficient classrooms, libraries, labs, and technical workshops, students' academic performance cannot be guaranteed. When planning and constructing buildings and other structures on school property, school plant planners and managers should have or take into consideration certain desired qualities or main

Corresponding author: David Onyemaechi Ekeh

✉ davidonyemaechi@gmail.com

Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo, Ebonyi State.

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goals. This includes the inhabitants' health and safety, the amount of space needed, the aesthetic appeal of the school grounds, the durability of the building, and the cost of future growth and development. Additionally, the structures' adaptability and usefulness are considered. The location, dimensions, and features of the school's facilities dictate the range and volume of extracurricular and curricular activities held both within and outside the building. A school building on a small lot might not have enough space for a playground or other recreational facilities (Torupere, 2016). The aforementioned explanation makes it abundantly evident that the school facility planning process is equally important in the academic performance of the students. According to Jimoh, Akinlosotu, and Ojo-Maliki (2017), schools' academic performance is being adversely affected by a lack of facilities for instruction and learning. However, in secondary schools in Abia state, precisely in Umuahia Educational Zone, this has not been empirically demonstrated to be the case. In light of this, the researcher set out to investigate empirically how school plant affected the academic performance of students in public secondary schools in the Umuahia Educational Zone of Abia state, Nigeria.

Statement of the problem

It is impossible to overstate the importance of school plants in the teaching and learning process. For example, conducive classrooms serve as common spaces for exchanging experiences and evaluating research findings in order to put them into practice if they are deemed feasible. However, the teaching-learning process will be hindered in schools with inadequate, poorly kept, and unsafe plants. According to the researcher's interviews with principals and teachers as well as published data, many schools' learning environments are unhealthy and appalling.

Some schools in Umuahia Educational Zone, Abia state, Nigeria seem to have insufficient school plants; this is evident in some schools where teaching and learning resources are not available and this makes the researcher to ask,

does availability of school plant impacts on students' academic performance in secondary schools? This presents the problem of study.

Purpose of the study

The main purpose of this study is to determine the impact of school plant on students' academic performance in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

Specifically, the study intends to:

1. Ascertain the impact of classroom building on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.
2. Examine the impact of school laboratories on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

Research questions

The following research questions guided the study:

1. What are the impact of classroom building on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria?
2. What are the impact of school laboratories on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria?

Research Hypothesis

The following hypothesis will guide the studying and will be tested at 0.5 level of significance.

H₀₁: There is no statistical significant difference in the mean ratings of male and female students on the impact of classroom building on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.



H0₂: There is no statistical significant difference in the mean ratings of male and female students on the impact of school laboratories on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

LITERATURE REVIEW

Review framework

The following theories were used to support this study; Skinnerian environmental theory, situated learning theory and system theory.

Skinnerian environmental theory

This section is based on the fact that environment is vital for the achievement of educational goal. This becomes necessary since the study is on the influence of school environment on the student achievement of public secondary schools in Abia State. The origin of environmental theories can be traced to a known psychologist named John Locke (1917). He is the father of the learning tradition. He postulated that experience and learning are basic and very essential to understanding of human behaviour. The environmental approaches conceive human behaviour as something that is acquired through the process of interaction with the environment, rather than inherited. According to this model, behavioral development is controlled by and is a function of the physical and psycho-social environment (Ngwoke, 2003). Children's development is believed to be shaped by the pattern of reinforcement it receives from the environment. Skinner (2001) contributed in shaping the views expressed by environmental approach. It includes the work of such people as Thorndike Toleman, Guthrie and Hull. These writers have these basic assumptions about the process of learning. These are: Learning is manifested by a change in behaviour, and the environment shapes behaviour. Therefore learning is the acquisition of new behaviour through conditioning. It has been observed that sometimes children develop new behaviour by observing other people's behaviour and by

observing the reinforcing or punishing experience of others. Albert Bandura's social learning theory emphasizes the importance of observational learning which occurs when the behaviour is influenced by watching the behaviour of a model. It is the consequences of the mode's behaviour that determines the behaviour of the observer. The common objects in our environment which children usually adopt as models include stars in the class, school teacher. Bandura listed four processes involved in observational learning, intentional, retention, production and motivational processes. He emphasized that social learning is interactional in nature. He stressed that human learning involves the interaction of the person, the person's behaviour and the environment. It is note worthy that a child's progress in the school is influenced by the attitude he develops towards not only the subjects he is to learn but also the school and the school milieu, hence his attitude will depend on the sort of experience he has had. Based on the underlining principles and assumptions guiding the above discussed theories, the current study is therefore, being anchored on the Bandura's social learning theory.

Theory of Situated Learning

This theory was proposed by Lave and Wagner, (1991), who argue that learning as it normally occurs is a function of the activity, context and culture in which it occurs (that it is situated). This contrasts with most classroom learning activities which involve knowledge which is abstract and out of context. Social interaction is a critical component of situated learning. Learners became involved in a community of practice which embodies certain beliefs and behaviours to be acquired. As the beginner or newcomer moves from the periphery of this community to its centre they become more active and engaged within the culture and hence assume the role of expert or older timer. These ideas are what Lave and Wagner (1991) called the process a legitimate peripheral participation. Other researchers have further developed the theory of situated learning. Brown, Collin and Duighid (2001) stressed the idea of cognitive apprenticeship: Cognitive apprenticeship supports learning in a domain by

Corresponding author: David Onyemaechi Ekeh

✉ davidonyemaechi@gmail.com

Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo, Ebonyi State.

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enabling students to acquire, develop and use cognitive tools in authentic domain activity. Learning, both outside and inside school, advances through collaborative social interaction and the social construction of knowledge. Brown et.al (2001) also emphasized the need for a new epistemology for learning one that emphasizes active perception over concepts and presentation. Suchman (2000) explored the situated learning framework in the context of artificial intelligence. Situated learning has antecedents in the work of Gibson (theory of affordance) and Vygotsky (social learning). In addition, the theory of schemed on mathematical problem solving embodies some of the critical element of situated learning framework. Situated learning is a general theory of knowledge acquisition. It has been applied in the context of constructing instructional materials for schools that focus on problems-solving skills. Using a model of situated learning, students taught using sound school environment may learn to: reinforce verbal message of teachers, focus more attention and become interested in the subject under study, motivate interest necessary to understand the lesson, provide sources of information and authority, and provide experience not otherwise availed in another medium

METHODOLOGY

The study adopted descriptive survey research design and it was considered suitable because the opinion of a representative sample of respondents was sought using questionnaire and the finding was generalized on the entire population. The population of the study consisted of all the secondary schools that made up Umuahia Educational zone numbering about 46 schools with 3300 SS2 students (SEMB, 2022). The choice of senior secondary class two students is guided by the assumption that the students would be in the middle class of senior secondary class. They would neither be adjusting to senior secondary syllabus as SS1 students would be doing nor would they preparing for external examination as the SS3 students rather they are in the best position to give information relating to the research as this is the class they are expected

to choose subjects relating to their future career choice. A sample size of 345 respondents was used, using Taro-Yamene's formula to draw from the population across the education zone. The instrument for data collection was questionnaire titled: School plant and Academic Performance Questionnaire (SPAPQ). The questionnaire was developed from literature by the researchers and used for data collection. The instrument was a four point response scale of strongly agreed (SA), Agreed (A), Disagreed (D) and strongly disagreed (SD) with corresponding values of 4, 3, 2, and 1 respectively. The instrument was face – validated by three experts: Two from Department of Science Education- AEFUNAI and one from Measurement and Evaluation Department- EBSU. Their corrections and suggestions were utilized to improve the initial copies of the questionnaire to produce the final copies. Cronbach Alpha reliability method was adopted to determine the internal consistency of the questionnaire items. A Cronbach Alpha coefficient of 0.79 was obtained and the collected data was analyzed using mean for research questions and t-test was used for the test of hypothesis. Any mean response of 2.50 and above was considered positive or required while any mean response below 2.50 was considered negative, more so the hypothesis will be tested at 0.05 level of significant.

RESULTS

Research Question 1

What are the impact of classroom building on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria?

Hypothesis 1

There is no statistical significant difference in the mean ratings of male and female students on the impact of classroom building on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria

Data for answering research question 1 and hypothesis 1 are presented in Table 1

Table 1: Mean and Standard Deviation on the impact of classroom building on academic performance of students (n=345)

S/N	Item statement	\bar{x}	SD	Sig.	Rmk
1.	The cleanliness and hygiene of classrooms influence my academic performance.	3.31	.78	.55	Agreed, NS
2.	The classrooms in our school are well-lit and adequately ventilated	3.35	.66	.06	Agreed, NS
3.	Well-maintained classroom infrastructure encourages a better learning environment	3.39	.62	.07	Agreed, NS
4.	Adequate lighting in classrooms enhances my ability to learn in school.	3.40	.74	.52	Agreed, NS
5.	Students do not perform well in a hot classroom	3.19	.76	.06	Agreed, NS
6.	classroom without lighting does not promote high academic performance	3.26	.68	.77	Agreed, NS
7.	Classroom without air brings about poor academic performance	3.24	.76	.92	Agreed, NS
8.	Overcrowded nature of the classroom can cause low academic performance.	3.34	.69	.98	Agreed, NS
9.	The condition of the classrooms positively contributes to my academic performance	3.22	.75	.98	Agreed, NS
10.	Poor seating classroom arrangement can make a student perform poorly academically	3.24	.69	.06	Agreed, NS

SD = Standard Deviation of the respondents and \bar{X} = Mean of the respondents

Data in Table 1 revealed that all the 10 items had their mean ratings ranging from 3.19 to 3.40 and were above the cut-off point of 2.50. This indicated that the respondents agreed of adequate classroom building impact positively the academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria. The standard deviation of all the 10 items ranged from .62 to .78, which showed that the respondents were not too far from the mean and opinion of one another in their responses on the impact of classroom building on academic performance of students in public secondary schools.

The p-values on all the items were all greater than the alpha-value of 0.05. With the forgoing, we therefore accept the null hypothesis for the items and reject the alternate hypothesis. Which means there is no significant difference between the mean responses of the male and female students on the impact of classroom

building on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

Research Question 2

What are the impact of school laboratories on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria?

Hypothesis 2

There is no statistical significant difference in the mean ratings of male and female students on the impact of school laboratories on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

Data for answering research question 2 and hypothesis 2 are presented in Table 2



Table 2: Mean and Standard Deviation on the impact of school laboratories on academic performance of students (n=345)

S/N	Item statements	\bar{x}	SD	Sig.	Rmk
1.	The presence of well-equipped laboratories positively contributes to my academic understanding	3.29	.74	.94	Agreed, NS
2.	Engaging in practical experiments in the laboratory enhances my learning experience	2.76	.87	.98	Agreed, NS
3.	Adequate supervision and guidance during laboratory sessions enhance my academic performance	3.30	.66	.93	Agreed, NS
4.	Access to modern laboratory equipment and technology positively impacts my academic performance	3.28	.71	.95	Agreed, NS
5.	The availability of resources in the laboratory facilitates better comprehension of scientific concepts	3.24	.75	.06	Agreed, NS
6.	The laboratory activities are well-integrated with the theoretical aspects of the curriculum.	3.22	.79	.77	Agreed, NS
7.	The cleanliness and organization of the laboratory environment contribute to a positive learning atmosphere.	3.24	.76	.92	Agreed, NS
8.	There are overall condition and maintenance of the school laboratories significantly affect my interest in scientific subjects.	3.22	.75	.97	Agreed, NS
9.	Bolbs are well fix and there is always constant light in the school laboratories for both teachers and students	2.89	.86	.93	Agreed, NS
10	My school laboratories is adequately furnish with toilet seat and mirror given conducive learning environment	3.45	.61	.09	Agreed, NS

SD = Standard Deviation of the respondents and \bar{X} = Mean of the respondents

Data in Table 2 revealed that all the 10 items had their mean ratings ranging from 2.81 to 3.45 and were above the cut-off point of 2.50. This indicated that the respondents agreed that adequate school laboratories impact positively the academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria. The standard deviation of all the 9 items ranged from .66 to .87, which showed that the respondents were not too far from the mean and opinion of one another in their responses on the impact positively the academic performance of students in public secondary schools.

The p-values on all the items were all greater than the alpha-value of 0.05. With the forgoing, we therefore accept the null hypothesis for the items and reject the alternate hypothesis. Which means there is no significant difference between the mean responses of the male and female students on the impact of school laboratories on academic performance of students

in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

DISCUSSION OF FINDINGS

The findings were discussed based on the following sub-heading derived from the study objectives and research questions: impact of classroom building on academic performance of students in public secondary schools and impact of school laboratories on academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria.

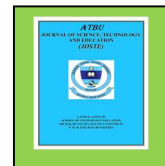
The responses of students on the impacts of classroom building on academic performance of students in public secondary schools, the result revealed that all the 10 items had their mean ratings ranging from 3.19 to 3.40 and were above the cut-off point of 2.50. This indicated that the respondents agreed that adequate classroom building impact positively the academic performance of students in public secondary schools in Umuahia Educational Zone,

Corresponding author: David Onyemaechi Ekeh

✉ davidonyemaechi@gmail.com

Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo, Ebonyi State.

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Abia state Nigeria. The standard deviation of all the 10 items ranged from .62 to .78, which showed that the respondents were not too far from the mean and opinion of one another in their responses on the impact of classroom building on academic performance of students in public secondary schools. However, the findings of the above study were in agreement with the view of Odufowokans (2011) who reported that there is a substantial association between the sufficient provision of classroom buildings and the academic achievement of secondary school students in Lagos State. This suggests that sufficient resources and operational physical classroom facilities are effective ways for improving academic performance to accommodate significant increases in school enrolment. More so, the views and observations of the authors cited on the impact of classroom building on academic performance of students in public secondary schools has helped to justify the findings of the study on research question 1.

The opinion of teachers on the impact of school laboratories on academic performance of students in public secondary schools, this revealed that all the 10 items had their mean ratings ranging from 2.81 to 3.45 and were above the cut-off point of 2.50. This indicated that the respondents agreed that adequate school laboratories impact positively the academic performance of students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria. The standard deviation of all the 9 items ranged from .66 to .87, which showed that the respondents were not too far from the mean and opinion of one another in their responses on the impact positively the academic performance of students in public secondary schools. This research aligns with Omiko (2015) observed that the utilization of the laboratory in Ebonyi State, Nigeria, fosters scientific attitudes among students in their study of Chemistry. The results concurred with Odutuyi (2015), whose research shown a significant correlation between the laboratory learning environment and students' academic achievement in chemistry. The views and observations of the authors cited on the impact of school laboratories on academic performance of

students in public secondary schools in Umuahia Educational Zone, Abia state Nigeria helped to validate the findings of the study in Table 2.

CONCLUSION

The significant influence of school plants on secondary school students' performance in schools in Umuahia Educational Zone, Abia state, Nigeria, is highlighted by this study. Hence, the quality of a school's physical infrastructure, resources, and facilities has a big impact on how well its learners learn. Technology resources, accessible libraries, well-equipped labs, and ample classroom space were identified as crucial contributing elements. Additionally, it has been shown that having supportive amenities and well-maintained school infrastructure improve students learning outcomes.

RECOMMENDATIONS

Based on the findings and conclusion of this study, the following recommendations were made;

1. To promote hands-on learning and high information retention among students, the federal and state governments should guarantee that all secondary schools have fully furnished science and computer labs.
2. The building and enhancement of supportive facilities, including sports fields, playgrounds, and extracurricular resources, should be advocated to foster students' comprehensive development.
3. Improving the resources and physical infrastructure of public secondary schools must be a top priority for the government and school officials.
4. Through its ministry of education, the federal and state governments should make sure that secondary schools are located in secure and conveniently accessible sites.
5. Regular maintenance and restoration of educational facilities should be conducted to foster an optimal learning environment for students.

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Corresponding author: David Onyemaechi Ekeh

✉ davidonyemaechi@gmail.com

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