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SCHOOL PLANT-MAPPING AND STUDENT ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN DELTA STATE, NIGERIA

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Abstract

This study investigates the relationship between school plant-mapping and student academic performance in public secondary schools in Delta State, Nigeria. The objectives include assessing the level of school plant-mapping available, and examining the relationship between library facilities, classrooms, and students' academic performance. Using a correlational ex-post facto research design, data were collected from 237 principals, representing 50% of the total population of 474 principals across 25 local government areas. A stratified sampling technique was employed. Two instruments were used: a checklist of school plants and the School Plants, Mapping, and Students' Academic Performance Questionnaire (SPMSAAQ). The questionnaire was validated and its reliability confirmed with a Cronbach Alpha coefficient of 0.708. Data analysis was performed using mean, standard deviation, coefficient of determination, and Pearson Product Moment Correlation Coefficient. Findings reveal a wide availability of school plants, including library facilities, classrooms, and laboratories. A significant positive relationship was found between the mapping of library facilities and students' academic performance ($r = .861$, $p < .05$), explaining 74.1% of the variance. Similarly, a significant relationship was observed between classroom availability and students' performance ($r = .634$, $p < .05$), accounting for 40.2% of the variance. The study concludes that well-mapped school facilities positively impact student academic outcomes. Recommendations include the government's increased investment in the construction, renovation, and maintenance of school infrastructure, alongside the active involvement of educational stakeholders in facility management and local improvisation of resources. These efforts are critical to sustaining and enhancing student academic performance in Delta State.

KEYWORDS: School Plant-Mapping, Students, Academic Performance, Availability, Compliance Level, Public Secondary Schools, and Delta State

Introduction

The school is an educational institution that provides structured instruction and learning environment for individual, children and adolescents to acquire knowledge, skills and value. The school is both an educational institute and a building being put in place to provide learning space and environment for the learners. The school is a formal organization and a vital tool for the development of a society and nation at large. It is made up of school officials or principals, teachers, and pupils. They collectively create a group of people who interact constantly on a daily basis within the educational setting in order to transmit societal ideals. School is a social institute were social reform can and should be acquired, the school is a planned and equipped environment, organised and structured to meet the educational needs of persons, or group of people who are of the same need of acquiring common goal. School plant mapping is the school site as well as all permanent and semi-permanent structures such as machines, laboratory equipment, and chalkboards required for effective teaching and learning. The space interpretation of the school curriculum is the school plant, in this instance, the curriculum will be impossible to apply without the physical teaching and learning facilities that are neither available nor badly provided and maintained.

However, school plant comprises the site, buildings, play grounds, health facilities, instructional materials and all forms of school equipment. It is the controlled environments that facilitate teaching and learning process as well as protect the wellbeing of the occupants. It can also be divided into other subgroups namely:

- The school landscape comprising of trees, grasses, lawns, hedges and accompanying paths,
- Security facilities such as walls, gates, alarm system, phones, visitors' books,
- Utilities such as electricity, pipe-borne water/borehole and transport facilities,
- Educational equipment such as computers, chalkboard, chalk, chart flannel graph, beakers, burette, pipettes test tubes, thermometers, weighing balances, map, glass jars, globes,
- Office equipment such as cupboards, generator, typewriter, photocopying machines,
- Sports facilities like football, table tennis, basketball,
- Classroom/educational equipment such as chairs, desks, tables, chalkboards, dusters, wash-hand basin, napkins, chalk
- Buildings like classrooms, administrative blocks, library, laboratories, health blocks, kitchen, examination hall, dining hall, assembly hall, clinics, rest rooms, toilets, hostels, store, staff rooms, workshops.
- Play grounds including football, volley ball, basketball and badminton, tennis court, swing slide ground (Olaniyan & Anthony, 2019).

The main objective of a school plant is to satisfy educational goals which have been predetermined by educational planners. School plant enhances better school programmes and the community needs by providing a place for psychological and physical safety for students and

teachers. It also enhances the academic performance of students (Ekpoh, 2018).

Furthermore, school plant-mapping is the systematic planning, design and optimization of the use of school physical environment to aid student learning, safety and well-being. It involves analysing and visualizing the school facilities, layout and resources creating an effective and efficient learning environment. School plant-mapping evaluates location, topography and climate, assessing room usage, layout and functionalities. It creates essential environment that aids student success and effective teaching and community engagement. It involves gathering data on factors such as student demographics, academic performance, facilities, resources, and community needs. The relationship between school mapping and the school plant is crucial for improving students' academic performance. For instance, through school mapping, educators can identify disparities in the distribution of resources among schools. This includes assessing the quality and adequacy of the school plant, such as whether schools have sufficient classrooms, libraries, or science labs. Disparities in the school plant can directly impact students' learning environments and access to educational resources, thus influencing their academic performance. School plant-mapping provides valuable data for strategic planning significant to school infrastructure development and maintenance.

Statement of the Problem

The persistent issue of poor academic performance among secondary school students has raised concerns among teachers, parents, and other stakeholders. A comprehensive analysis of the West African Examinations Council (WAEC) Chief Examiners' reports for the years 2014-2022 reveals a continuous decline in students' performance. The observation shows that only a small percentage of secondary school graduates meet the requirements for admission to tertiary (higher) education institutions. As a result, the majority of these dropouts become social annoyances and miscreants. Nigerian public secondary schools face the combined challenges of unavailability of school plant, and in some cases, deteriorating conditions, out-of-date design and capacity utilization pressures due to the continuous neglect by government and schools' administrators. These have posed a threat to most public schools in Nigeria. Particularly, public secondary schools in Delta State are in very deplorable conditions, causing students to suffer unwarranted inconveniences before, during and after school hours. Several researchers have investigated factors such as school climate, instructional materials, school gates, physical facilities, and infrastructure as components that affect students' learning outcomes, but not many have bothered much on the impact of school plant and school mapping on students' academic performance. It seems that most public secondary schools still lack good and reliable school plant. The issue of students' performance has been a major subject of discussion among stakeholders. This is because schools are established to provide avenue for students to acquire knowledge. Despite the efforts put in place by stakeholders and researchers across the country to salvage the educational system of Nigeria, students' performance remains a major challenge. Hence, the problem of this study is, what is the influence of school plant and school mapping on student academic performance in public secondary schools in Delta State?

Purpose of the Study

The purpose of the study is to investigate the relationship that exists between school plant-mapping and student academic performance in public secondary schools in Delta State. The specific objectives include:

1. Determine the level of school plants-mapping available in Delta State public secondary schools?

2. Assess the relationship between school plant-mapping of library facilities and

students' academic performance in public secondary schools in Delta State?

3. Determine the relationship between school classroom and students' academic performance in public secondary schools in Delta State?

Research Questions

The following research questions will guide the study:

1. Which are the school plants-mapping available in Delta State public secondary schools?
2. What is the relationship between school plant-mapping of library facilities and students' academic performance in public secondary schools in Delta State?
3. What is the relationship between school classroom and students' academic performance in public secondary schools in Delta State?

Hypotheses

The following null hypotheses have been formulated and will be tested at 0.05 level of significance.

$H0_1$. There is no significant relationship between school plant-mapping of library facilities and students' academic performance in public secondary schools in Delta State.

$H0_2$. There is no significant relationship between school classroom and students' academic performance in public secondary schools in Delta State.

LITERATURE REVIEW

Meaning of School Plant / School Mapping

The term "school plant" refers to all of the material provisions in a school environment and is one of the most important components of school management. School plants are spatial interpretations of school curriculum. This means that the curriculum cannot be executed unless the necessary physical facilities for teaching and learning are present. It contains permanent and semi-permanent structures, as well as machineries, laboratory equipment, the blackboard/chalkboard, learner and instructor tools (Aba, 2012). School plant is one of the major aspects of school administration and refers to all the material provisions in a school environment. Njoku (2014) describe school plants as educational facilities that are tangible such as buildings, land equipment, machineries, furniture, fixtures and fittings which are put into use and capable of providing excellent educational services. Yusuf (2018) defined school plants as space interpretation of school curriculum. This means it will be impossible for the curriculum to be implemented if the physical facilities required for teaching and learning are not available. It also includes the site, the building and the equipment. It includes permanent and semi-permanent structure as well as items such as machines, laboratory equipment, the blackboard/chalkboard, the learner and teacher tools.

On the other hand, school mapping can be conceptualized in different ways. Kaufman and Herman (2002) see school mapping as requiring systematic effort designed to locate educational facilities in such a manner that target age groups of the population are able to use the facilities to their maximum advantage. To Kaufman and Herman school mapping is not a one-shot thing but a

continuous process of ensuring that school facilities are provided where they ought to be. Also, Igwe in Oboegbulem (2007) sees school mapping as a process of planning the location and spacing of educational institutions taking into consideration the demographic, pedagogical, economic, geographical, social, administrative, and political and manpower factors. For Igwe, school mapping is seen as a technique and procedure to plan the location and spacing of educational institutions with a view to achieving educational objectives. School mapping is therefore a process for collecting and recording curriculum-significant data which become a tool to help teachers improve teaching and learning. It is education planning process that incorporates spatial and demographic dimension.

Meaning of School Plant-Mapping:

School plant-mapping is the systematic planning, design and optimization of the use of school physical environment to aid student learning, safety and well-being. It involves analysing and visualizing the school facilities, layout and resources creating an effective and efficient learning environment. School plant-mapping evaluates location, topography and climate, assessing room usage, layout and functionalities. It is the process of systematically assessing and analyzing various aspects of educational institutions within a specific geographic area. School plant mapping is a deliberate approach to planning educational facilities, ensuring they are strategically located to serve the population effectively (Kenneth, 2018). According to Yusuf and Akinniranye (2011) its aim is to minimize the use of the existing resources, including building and equipment, to support educational objective, School plant mapping is crucial for creating effective and efficient environments. The importance of school plant mapping extends beyond mere visualization;

[1] It is essential in planning effective school management and resource allocation. By identifying space utilization, administrators can enhance the learning environment and ensure that facilities meet the needs of students and staff

[2]. Various techniques, such as Geographic Information Systems (GIS), Computer-Aided Design (CAD), and manual mapping methods, are employed to ensure accurate data collection and representation, which is vital for informed decision-making

[3]. School plant mapping has a significant role in safety planning by spotting evacuation routes, emergency exits, and assembly points, thereby ensuring the safety of students and staff during emergencies

[4]. Compliance with regulatory standards, including local building codes and safety regulations, is also a critical aspect of school plant mapping, ensuring that the created maps meet legal and safety requirements

Availability of School Plants-mapping in Public Secondary Schools

The term availability in the context of this study, is the degree or state or quality of supply of equipment, facilities, amenities, infrastructure, human and material resources, etc for use in a school environment. It is the process of making available the instruments and facilities needed in a school plant for effective and efficient performance of human and material resources which in turn enhances teaching and learning process. Oyesola (2007), states that the school plant availability is to satisfy educational goals which have been predetermined by educational planners. School plant availability and utilization include school location, instructional space, administrative space, classroom facilities, recreational facilities which are relevant in the teaching and learning process in the educational system. The rate at which these spaces may enhance

proper teaching and learning depends on the location of structure and facilities within the school environment. A proper school plant in terms of location, structure and facilities would encourage effective teaching and learning and enhance better learning environment.

Adesina (2004) noted that for effective teaching and learning situations, physical facilities and educational goals should be viewed as being closely interwoven and interdependent. In other words, poor performance of students in secondary schools has direct correlation with nonavailability, poor management and maintenance culture of school plant. The problem generated by non-provision of school plant in secondary schools can no longer be dismissed with a wave of hand. Physical facilities in most secondary schools in Bayelsa state have not been in good shape. In some cases, students sit on the floor to receive lessons, also many of the classrooms, laboratories, libraries, playing grounds are in a terrible state of disrepair.

Ajayi (2006) showed that in most of the nation's secondary schools, teaching and learning take place under an unstable environment, which in most cases lack basic materials. Physical conditions refer to those things that must be available in the working place for effective work to take place. In the context of the school system, they are those things that enable the teacher to be able to carry out the teaching/learning process effectively and contribute to the achievement of the school goals and objectives without fatigue and distraction. However, there should be presence of physical condition such as lighting, ventilation, good building constructions, location, instructional materials, sufficient windows, doors, vents and fans to cool the heat during hot weather (summer). All these improve work and health for both the teachers and the learners.

It has been revealed that a significant number of secondary school physical facilities are not conducive for learning. He stated that to achieve improved performance by the students, there should be conducive physical environment for students in the secondary schools. Unfortunately, some of the urban and rural schools lack adequate infrastructural facilities like classroom blocks as some of the students learn under shade of trees (especially the newly established ones). In some cases where the classroom blocks exist, one discovers that most of their roofs are blown off by rain storms. Other schools have pot-holes in the greater portions of their classroom's floors begging for repairs or renovation. Worst still, a greater percentage of the students sit and write on the bare floor because of insufficient classroom seats (Okoko & Ibara, 2020).

Okoko and Ibara (2020) investigated the provision and management of school plant in Public Secondary Schools in Bayelsa State, Nigeria. The study adopted the ex-post facto research design. Four research questions and three null hypotheses guided the study. The population for the study was 142 male principals and 52 female principals drawn from public secondary schools across the 8 Local Government Areas in Bayelsa State, Nigeria. Thus, the total population for the study consisted of 194 public secondary school principals. The proportionate stratified sampling technique was used for the study. The instrument used for data collection was a structured questionnaire titled "provision and management of School Plant in Public Secondary School Questionnaire (PMSPPSSQ)". The reliability of the research instrument was obtained by application of test-retest method using person product moment correlation to establish a reliability co-efficient of 0.95.125 copies of the questionnaire only were retrieved and analyzed using mean and standard deviation for the research questions and indicated that some of the school plant were not available, only but some classroom, administrative blocks, chalkboard, football field, furniture, school farm, Hostel, library, accommodation and others that are not in good condition were seen in schools. The findings also revealed that lack of funds to procure and manage the schools equipment and poor maintenance culture were some of the problems associated with provision and management of school plant. The study concluded that school plant remained one essential factor to the realization of the goals of secondary education in Nigeria.

Adetule and Ayodele (2019) noted from their study that school facilities such as instructional space and administrative space are the school facilities which serve as pillar of support for effective teaching and learning process. Evidently, their observation during their personal visits to some schools shows that most of the school plant which are supposed to promote and enhance teaching and learning in secondary schools are obsolete in form and thereby, creating a serious challenge to the twenty first century educational needs of the learners. Ohia (2019) revealed that effective school plant planning ensures relevant, adequate and functional facilities are utilized when they are provided in schools so that they can be used for increased performance of pupils.

School Plant-Mapping of Library Facilities and Students' Academic performance in Public Secondary Schools

The information resources in our school are very vast and fast growing. It is important for both teachers and students to be aware of the formal processing strength and use of the library resources. Teaching and learning mostly takes place in the classroom. However, a reasonable amount of the materials needed for effective teaching and learning are found in the library. The school library provides basic ancillary services that should be provided by any active institution (Akomolafe & Adesua, 2016). Books in the library are made appropriate for the age and level of the learner. The needs of the students and teachers must be captured when setting up a library. The library is made of books and non-book materials such as records, files, slides and artefacts. The library plays a major role in the enhancement of learning and teaching activities which take place in the classroom.

A library is a collection of sources, resources, and the structure that houses them that is organized and maintained for us by a public body, an institution, or a private individual. It can refer to the collection itself, the building or room that houses it, or both. The term "library" has taken on a new meaning: "a collection of useful material for use." It can also be used by public publishers to name series of significant books, such as the Anglo-Catholic Theology Library (Tsafe, Busaka & Mohammed, 2016). Libraries are defined as an organized collection of published and unpublished books and audio-visual materials with the assistance of staff who can provide and interpret such materials as needed to meet the informative, educational, and recreational needs of their users. Libraries are regarded as institutions that select, acquire, organize, preserve, and disseminate sources of information of accumulated knowledge and experiences to those who require them (Haruna, 2015). It is always said that libraries are the invisible teachers all the time, because students can always have access to any type of information in the library in the absence of teacher. The educational contributions of libraries in the provision of learning resource, lending of information materials to students, inculcating use of library skills etc. make them a functional library in the educational system.

Libraries facilities are considered to be particularly significant as cradles of books. Findings by Onwubiko and Uzoigwe (2014) showed that 83 percent of all students had access to books from the school libraries. Clarke (2014) contended that libraries do not only provide books, but they also serve as learning hubs with a broad range of print and electronic resources that support students' academic performance. George (2011) argued that libraries facilities with qualified librarians and appropriate technological support systems contribute immensely to students' academic performance. Ogundele and Moronfoye (2013) asserted that libraries facilities do not only develop reading habits in students, but assist them to learn and process information

effectively. Clarke (2014) postulates that the main aim of libraries is to ensure students access to books for enhanced learning outcomes and superior social development. According to Akobundu (2013) library facilities has a significant relationship with students' academic performance. Mbashir and Adeoti (2015) discovered that libraries have a correlation with student performance, and schools with well-functioning library facilities typically maintain high academic performance. According to Akobundu (2013) the books reserved for reading in the school library are directly significant to students' achievement.

Library facilities should be well equipped and accessible to all students and teachers. Ullah & Farrog (2013) indicated that functional library have positive relation with students' vocabulary, grammar, comprehension, writing and spelling skills. These abilities need well managed library where they improve their skills and academic performance. Orji (2012) revealed that library facilities has correlation with students' achievement and schools which have well operational library facility usually preserve high academic performance. The school library is at the heart of any educational enterprise as well as one of the most important educational support services (FME, 2014). The school library is integral to the teaching and learning process by facilitating the work of the classroom teacher as well as making sure every student has adequate access to educational resources. The library is also a means of knowledge and factual information, a center of self-education and intellectual recreation as well as a beacon of enlightenment which provides preserved knowledge (Oyetola & Gboyega, 2020).

School Plant-Mapping of Buildings and Students' Academic performance in Public Secondary Schools

School building consists of classrooms, offices, convenience sporting facilities, security, laboratories halls and workshops. Bloom in Nweneka (2016) opines that a well functional school building with a wide array of teaching and learning aids provide positively significant to quality assurance in academic performance. The quality of education received by the students bears direct relevance to the availability or lack of physical facilities and the overall environment in which learning takes place. Availability of adequate and sufficient school plant is thus expected to positively reflect the academic performance of students (Alimi, 2017). FRN (2013) noted that secondary school needs school plant and facilities which consist of all types of buildings for academic and non-academic activities; equipment for academic and non-academic. Their appearance and maintenance influences students' academic performance (Abiodun-Oyebanji, 2017).

In the same vein, Comfort and Veronica (2016) noted that the school buildings in the school setting go a long way to motivate students to learn; physical facilities in any school system range from the school plant that is the school buildings, classroom, library, laboratories, toilet facilities, learning materials to other infrastructures that would likely motivate students towards learning. Comfort and Veronica (2016) submitted that experience has shown that most of the school buildings that are germane to effective learning/academic performance of students appear not to be sufficient in our public secondary schools today. Hallak (2019) identified school buildings as the main factor contributing to academic performance in the school system.

In the words of Adeyemi (2018) performance is a measure of educational output. Academic performance can be viewed as the extent to which an individual learner acts or does a piece of work, how well or poor he/she does the job or the activities within a learning process. Adeyemi (2018) stated that poor academic performance however can be regarded as having performed below the required academic performance. Ajayi (2012) referred to poor academic performance as performance that fall below the desired standard. In view of above, Ajayi and Ayodele (2011) emphasized that the availability of school buildings is quite important to achieving effectiveness

in instructional delivery and supervision in the school system. They further buttressed the fact that non-availability of school buildings which is being experienced in secondary schools is a perfect reflection of what obtains in the university system.

Furthermore, Ogunniyi (2012) claimed that school buildings play a key role in the teaching and learning. This was supported by Adedeji (2018) who noted that these school buildings have to be adequate and should be in good condition for schools to function properly. In the other hand, Onyebuenyi and Oluka (2022) stated that well sited school buildings with aesthetic conditions often contribute to improved performance in the school system. He also argued that the availability of school building and other plant facilities are very important as they could enhance effective teaching and learning. Similarly, Chandan (2018) claimed that for effective teaching to take place in any educational setting there must be provision of adequate and quality school buildings. Adewunmi (2020) noted that the availability of adequate number of school buildings had significant influence on pupil's academic performance. He further emphasized that adequate number of school buildings should be made available in schools.

School Plant-Mapping and Students' Academic performance in Public Secondary Schools

In the educational landscape, understanding the factors influencing student achievement is paramount (Hanushek et al., 2023). Among these, school mapping, the process of visualizing and analyzing spatial relationships between schools and their communities, has emerged as a powerful tool (Yusuf & Akinniranye, 2011). This essay explores how school plant mapping, through spatial analysis, resource allocation, and consideration of socio-environmental factors, shapes students' academic performance. School plant-mapping utilizes Geographic Information Systems (GIS) and spatial analysis to depict the geographical distribution of schools, demographics, infrastructure, and resources (Caillods, 2013). By layering data on student demographics, socioeconomic status, and academic performance, educators and policymakers gain insights into spatial inequalities in educational access, quality, and equity (Earl et al., 2023). This unveils achievement gaps and the factors influencing students' trajectories. A crucial aspect of school mapping's influence lies in its impact on resource allocation (Andrews et al., 2023). Educational systems often grapple with unequal resource distribution, leading to disparities in opportunities (Rubin et al., 2022). School mapping allows for identifying these disparities, particularly in areas with concentrated disadvantaged populations. Schools in economically challenged neighborhoods often face issues like inadequate funding, limited facilities, and staffing shortages (Darling-Hammond, 2020). These challenges translate into outdated resources, overcrowded classrooms, and a lack of specialized programs, hindering student learning. Perpetuating a cycle of disadvantage, this inequitable distribution widens achievement gaps and social inequalities.

RESEARCH METHOD AND PROCEDURE

This study employed the correlational research method of the ex-post facto research design. The population of the study will comprise of 474 principals in public secondary schools in Delta State in the 2023/2024 Academic Session. The sample for the study consisted of 237 principals, which represents 50% of the total population of principals in public secondary schools in Delta State. The proportionate stratified sampling techniques will be used to select the sample for the study. In this case, the researcher will select 50% of principals from each of the 25 local government area of Delta State.

Two research instruments were used for this study. The instruments are Students' check list, WAEC/NECO result and questionnaire developed by the researcher titled: School Plants, Mapping and Students' Academic performance Questionnaire (SPMSAAQ). The questionnaire

consists of 4 sections components. Section A seeks information on general bio data of the respondents. Section B seeks information on school plants available for students' Academic performance, section C seeks information on library facilities and students' academic performance. Lastly, section D seeks information on school buildings and students' academic performance. The rating scale of 4 points was used. It was used to measure each item on the questionnaire in sections B where Sufficiently Available (SAV) = 4, Available (AV) = 3 (FAV) = 2 Fairly Available = 1, (NAV) Not Available. Section C to D 4(SA) Strongly Agreed, 3(A) Agreed, 2(D) Disagreed 1(SD) Strongly Disagreed.

The face and content validities of the instruments were done through experts' judgement. The questionnaire was prepared by the researcher in line with the objective of the study. The instrument was given to the research supervisor and two other experts in the Department of Educational Management and Foundation, for assessment, constructive criticism, correction and validation. This is to ensure the face and content validities of the instrument. The questionnaire was administered to 50 secondary school principals in Edo State. Respondents from Edo state was chosen because they were not participated in the final study. The responses were scored and subjected to Cronbach Alpha using SPSS which obtained a general coefficient of 0.708. However, research questions 1 was answered using mean and standard deviation while research questions 2 & 3 was answered using coefficient of determination. The hypotheses were tested using Pearson Product Moment Correlation Coefficient. The null hypotheses were tested at 0.05 level of significance.

DATA PRESENTATION AND DISCUSSION

Demographic Data

Respondents in this study were represented according to sex, number of times school opened, grade obtained and location of respondents.

Table 1: Respondents according to sex

Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Male	130	52.1	52.1	52.1
Female	100	47.9	47.9	100.0
Total	230	100.0	100.0	

Sources: Field work 2024

Data in Table 4.1 shows respondents according to sex. The data shows that out of 230 respondents, 130(52.1%) and 100(47.9%) were male and female respondents respectively.

Table 2: Respondents according to school location

Location	Frequency	Percent	Valid Percent	Cumulative Percent
Urban	110	40.8	40.8	40.8
Rural	120	59.2	59.2	100.0
Total	230	100.0	100.0	

Sources: Field work 2024

Data in Table 2 shows respondents according to location. The data shows that out of 230 respondents, 110(40.8%) and 120(59.2%) were urban and rural respectively.

Answering of Research Questions

Research Question 1: Which are the school plants-mapping available in Delta State public

secondary schools?

Table 3: Mean and standard deviation on school plants-mapping available in Delta State public secondary schools

S/N	School plant-mapping	Mean	SD	Remark
1.	Library facilities	3.01	.59	+
2.	School buildings	3.34	.62	+
3.	Laboratory equipment	3.00	.62	+
4.	Recreational facilities	3.14	.61	+
5.	Instructional materials	3.13	.62	+
6.	Health facilities	3.32	.52	+
7.	ICT facilities	3.11	.59	+
8.	Infrastructural facilities	3.05	.61	+
9.	Technical workshop	3.13	.56	+
10.	Classrooms	3.07	.49	+
11.	Instructional materials	2.96	1.11	+
12.	School machinery	2.95	1.15	+
13.	School chairs and tables	2.83	1.18	+
14.	Blackboard	2.63	1.06	+
15.	School location	2.82	1.20	+
	Average mean	2.98	1.11	+

Keys: + = Agree; - = Disagree

Data in Table 3 shows the mean and standard deviation on school plants-mapping available in Delta State public secondary schools. The result on the table revealed that respondents agree on all the items. Specifically, respondents agree on library facilities, school building, laboratory equipment, recreational facilitates, instructional materials, health facilities, ICT facilities, infrastructural facilities, technical workshop, classrooms, instructional materials, school machinery, school chairs and tables, blackboard, and school location with mean rating range from 2.63 to 3.34 respectively. Thus, the items mention above are school plants-mapping available in Delta State public secondary schools.

Research Question 2: What is the relationship between school plant-mapping of library facilities and students' academic performance in public secondary schools in Delta State?

Table 4: Relationship between school plant-mapping of library facilities and students' academic performance

Variables	Mean	SD	r	r^2	r^2%	Remark
School plant-mapping of library facilities	3.41	.32	.861	.741	74.1	Significant
Student academic performance	3.31	.49				

Sources: Field work 2024

Data in Table 4 shows the relationship between school plant-mapping of library facilities and student academic performance. The result shows school plant-mapping of library facilities with a mean of 3.41, SD = .32, and student academic performance with a mean of 3.31, SD= .49. The computed r value of .861 shows that there is a relationship between school plant-mapping of library facilities and student academic performance. The r^2 value of .741 revealed that school plant-mapping of library facilities is significant to student academic performance by 74.1% in public secondary schools in Delta State.

Research Question 3: What is the relationship between school classroom and students' academic performance in public secondary schools in Delta State?

Table 5: Relationship between school classroom and student academic performance

Variables	Mean	SD	r	r^2	r^2%	Remark
School classroom	2.72	.42	.634	.402	40.2	Significant
Student academic performance	3.31	.49				

Sources: Field work 2024

Data in Table 5 shows the relationship between school classroom and student academic performance. The result shows school classroom with a mean of 2.72, SD = .42, and student academic performance with a mean of 3.31, SD= .49. The computed r value of .634 shows that there is a relationship between school classroom and student academic performance. The r2 value of .402 revealed that school classroom is significant to student academic performance by 40.2% in public secondary schools in Delta State.

Testing of Hypotheses

Hypothesis 1: There is no significant relationship between school plant-mapping of library facilities and students' academic performance in public secondary schools in Delta State

Table 6: Pearson r between school plant-mapping of library facilities and student academic performance

		School plant-mapping of library facilities	Student academic performance
School plant-mapping of library facilities	Pearson Correlation	1	.861**
	Sig. (2-tailed)		.000
	N	230	230
Student academic performance	Pearson Correlation	.861**	1
	Sig. (2-tailed)	.000	
	N	230	230

**. Correlation is significant at the 0.05 level (2-tailed).

Table 6 revealed the Pearson r on school plant-mapping of library facilities and student academic performance. The table shows that there is a positive relationship with r value of .861 and significance p=.000. Therefore, the hypothesis which states that there is no significant relationship between school plant-mapping of library facilities and student academic performance in Delta State was rejected. Thus, there is a significant relationship between school plant-mapping of library facilities and student academic performance in Delta State.

Hypothesis 2: There is no significant relationship between school classroom and students' academic performance in public secondary schools in Delta State.

Table 7: Pearson r between school classroom and student academic performance

		School plant-mapping of library facilities	Student academic performance
School classroom	Pearson Correlation	1	.634**
	Sig. (2-tailed)		.000
	N	230	230
Student academic	Pearson Correlation	.634**	1

performance	Sig. (2-tailed)	.000	
	N	230	230

**. Correlation is significant at the 0.05 level (2-tailed).

Table 7 revealed the Pearson r on school classroom and student academic performance. The table shows that there is a positive relationship with r value of .634 and significance p=.000. Therefore, the hypothesis which states that there is no significant relationship between organization climate and student academic performance in Delta State was rejected. Thus, there is a significant relationship between school classroom and student academic performance in Delta State.

Discussion of Results

Level of School Plants-Mapping Available

Finding revealed that school plants-mapping available in Delta State public secondary schools include; library facilities, school building, laboratory equipment, recreational facilitates, instructional materials, health facilities, ICT facilities, infrastructural facilities, technical workshop, classrooms, instructional materials, school machinery, school chairs and tables, blackboard, and school location. This finding from the study on public secondary schools in Delta State reveal a range of school plant-mapping available in secondary schools. These school plant would help student contribute to the learning process, which will also enable them to obtain a better performance. This finding supports the findings of According to Olaniyan and Anthony (2018) in Lagos states that school plants are facilities that physically and geographically support teaching and learning and, as a result, help in achieving desirable results as indicated by good academic performance of education products. Also, research by According to Akomolafe and Adesua (2016) opined that school plant are facilities that are available to facilitate students learning outcome. It includes books, audio-visual, software and hardware of educational technology; so also, size of classroom, sitting position and arrangement, availability of tables, chairs, chalkboards, shelves on which instruments for practical are arranged. The findings also in line with Adesina (2004) noted that for effective teaching and learning situations, physical facilities and educational goals should be viewed as being closely interwoven and interdependent. In other words, poor performance of students in secondary schools has direct correlation with nonavailability, poor management and maintenance culture of school plant.

School Plant-Mapping of Library Facilities and Student Academic Performance

Finding revealed that there is a significant relationship between school plant-mapping of library facilities and student academic performance in Delta State. The significant relationship between school plant-mapping of library facilities and student academic performance in Delta State can be attributed to provision of library facilities, e-book, journals, document, newspaper, test book, audio tape and projects. The school plant mapping of library facilities creates a supportive and well-organized environment, reducing obstacles and aligning student efforts with the school's goals. A good library facilitates helped better to ensure an effective learning environment of the students. School plant-mapping of laboratory equipment provide a clear vision, enhancing students' engagement by making available library equipment for teaching and learning. This finding is in line with the findings of Dada, (2016) placed that, the quality and amount of these library facilities have been recognized as critical variables deciding students' academic performance. It also agrees with the study of Mark, (2016) and Ajayi, (2019) they kept up that, elevated level of students‟ academic performance may not be ensured where instructional spaces, for example, study halls, research facilities, libraries, specialized workshops and so forth are basically faulty. This finding is also in corroboration with that of Dada, (2016) placed that, the quality and amount of these library facilities or resources have been recognized as critical

variables deciding students' academic performance. He further expressed that the significance and suitability of these learning assets to the nearby environment are imperative to the accomplishment of the public destinations and objectives. However, the study of Adesina (2010) disagreed with the findings based on the fact that accessibility of library facility and offices alone aren't adequate condition for good achievement.

School Classroom and Student Academic Performance

Finding revealed that there is a significant relationship between school classroom and student academic performance in public secondary schools in Delta State. The significant relationship between school classroom and student academic performance in public secondary schools in Delta State is due to the impact of a supportive and positive work environment on student' performance. Elements of the school classroom, such as desk, table, marker board, books, and a clear alignment, create a conducive environment for learning. When students feel psychologically supported, can freely exchange ideas, and experience a sense of collaboration and trust, they are more motivated and engaged in their classroom activities. However, a good classroom will reduce stress and enhances student academic performance and also to help attain a better performance. This finding harmonizes with the findings of Nweneka (2016) opines that a well functional school building with a wide array of teaching and learning aids provide positively significant to quality assurance in academic performance. Another study by Comfort and Veronica (2016) noted that the school buildings in the school setting go a long way to motivate students to learn; physical facilities in any school system range from the school plant that is the school buildings, classroom, library, laboratories, toilet facilities, learning materials to other infrastructures that would likely motivate students towards learning. Similarly, a study in Tanzania by Hallak (2019) identified school buildings as the main factor contributing to academic performance in the school system. In Kenya, Onyebuenyi and Oluka (2022) emphasized that well sited school buildings with aesthetic conditions often contribute to improved performance in the school system. He also argued that the availability of school building and other plant facilities are very important as they could enhance effective teaching and learning. Furthermore, the work by Adewunmi (2020) in the United States confirmed that the availability of adequate number of school buildings had significant influence on pupil's academic performance. He further emphasized that adequate number of school buildings should be made available in schools.

Conclusion and Recommendations

In this study, it was concluded that the level of student academic performance in Delta State public secondary schools is high. Also, that school plants-mapping available in Delta State public secondary schools include library facilities, school building, classrooms etc. Moreso, there is a significant relationship between school plant-mapping of library facilities and student academic performance in Delta State. Additionally, that there is a significant relationship between school classroom and student academic performance in public secondary schools in Delta State.

The following recommendations are based upon the results of this study and will hopefully guide other investigations as data is gathered and analyzed on this very important topic.

1 With this renewed emphasis on school outcomes such as academic performance, government should improve public education, by construction, renovation and maintenance of school buildings with help to enhance academic performance of students.

2 The government should make an effort to map out a good environment for school.

3 Educational administrators, planners and other stakeholders should supplement the government effort by not only maintaining the school plant and facilities but also improvised these items locally from where the schools are situated.

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