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## School Facilities and Senior Secondary School Physics Students' Academic Performance in Adamawa State, Nigeria

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**Abstract** The study investigated the relationship between school facilities and students' academic performance in Physics in Adamawa state, Nigeria. Three objectives were formulated which lead to three research questions and three null hypotheses. A sample of 230 SSS II students offering Physics was chosen from the selected secondary schools in Adamawa state. The study adopted correlational design. The instruments used for data collection is School Facilities Questionnaire (SFQ). The instrument was duly validated and the reliability coefficient of 0.78 was calculated using Cronbach alpha. Mean and standard deviation were used to answer research questions while regression analysis was used to test the null hypotheses at 0.05 level of significance. The finding revealed that there is significant relationship between classroom facilities and students' academic performance of students in Physics in secondary school of Adamawa State,  $F_{(1, 229)} = 4.354$ ,  $p < 0.05$ . The finding also revealed that there is no significant relationship between school library and students' academic performance of students in Physics in secondary school of Adamawa State,  $F_{(1, 229)} = 0.434$ ,  $p > 0.05$  and Furthermore, the finding of the study revealed that there is significant relationship between instructional materials and students' academic performance of students in Physics in secondary school of Adamawa State,  $F_{(1, 229)} = 5.284$ ,  $p < 0.05$ . It can be concluded that classroom facilities and instructional materials enhances students' academic performance. It can also be concluded that School library did not enhance students' academic performance. It is recommended among others that the government through the Ministry of Education should make available science instructional materials for use by teachers to enhance students' academic performance.

**Keywords** School facilities, school library, instructional materials, classroom facilities

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### Introduction

Poor academic performance of students in Nigeria has been of great concern to the education stakeholders which include government, parents, teachers, and even students themselves. [9] stressed that quality of education not only depends on the teachers as reflected in the performance of their duties, but also in the effective coordination of the school environment. Education is a tool for effective development of any country like Nigeria. [2] said major concern has centered on the quality of teachers and non-commitment of the students on their studies due to the distractions that hamper learning, but very little attention has been given to the learning environment. Environment in which the students learn such as classrooms, libraries, laboratories, playgrounds, conveniences, maintenance culture among others are variables that affect students' learning and academic performance. Hence, the learning environment remains an important area that should be studied and be well managed to enhance students' academic performance.

The Federal Republic of Nigeria [10] stipulates that the school environment especially the physical environment should be made conducive to facilitate the learning process. The policy recommends that classroom should be well constructed and spacious and all types of physical facilities such as instructional materials, library,



laboratory, playing ground, and staff rooms should be provided for effective teaching and learning process. Good modern physical facilities in school could significantly promote students' academic performance. The size of classrooms, play-grounds and availability of material resources relative to the number of students in a school could also affect learning. [1] opined that physical facilities 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 school buildings, classroom, library, laboratories, learning materials to other infrastructures that would likely motivate students towards learning [1].

School libraries in the educational institutions such as pre-primary, primary and secondary schools are important to the life-wire and foundational up-bringing of children. This is because they primarily stock materials that are of interest and developmental growth for young, teenagers and youths of the era.. However, such collections of materials, to an extent make provisions for teachers, whereas the services are mainly aimed at pupils and students in the schools. School libraries are known as learning laboratory for the school. They provide the total learning package required by the students and their teachers.

[2], corroborated [12] view, they revealed that the availability of adequate number of physical facilities had significant influence on pupil's academic performance. They further emphasized that adequate number of physical facilities should be supplied to state primary schools. [2], in their study observed that inadequate provision of school resources has been a major factor of poor student's academic performance in Ekiti State. He equally remarked that without adequate physical resources/facilities there would be a continuous decline in student's academic performance.

[9] stated that well sited school buildings with aesthetic conditions, playground, laboratory, etc. usually contribute to achieving higher educational attainment by the students. important element of school building is the classroom. The classroom physical environment plays an important role in students' educational success. Classroom physical environment is defined as the physical characteristics of classroom. Physical classroom environment includes different things like size of classroom, floor, walls, desks, lighting, etc. [4] found that students in well-designed classrooms performed better than their peers in classrooms without these features. [5] in a study on relationship between classroom environment and students' academic performance found that there is a positive correlation between classroom environment and academic performance of students.

[16] examined the use of instructional materials and educational performance of students in Integrated science in unity schools in Jalingo, Taraba state. The research design was experimental specifically pretest-post test, non randomized control group design. The population consisted of all JSS students of FSTC Jalingo. The sample of the study consisted of 249 students in the junior section of Federal science and Technical college Jalingo. The post –tests mean scores were compared using a Z-test statistical analysis. Findings revealed a statistical significant difference in the mean scores of experimental and control groups.

[13] investigated the impact of instructional resources on the academic performance of JSS learners of Social Studies in Katsina State, Nigeria. Thus, the quasi-experimental design was adopted for the study and a sample of 400 was selected through the simple random sampling. The SPSS version 16 was used to analyze the t-test statistic, and the level of significance for determining the statistical significance of the study was placed at 0.05 with degree of freedom 118 for hypothesis one and 58 for hypotheses two, three and four. The result showed among other findings that there is significant difference between academic performance of male and female social studies learners when using instructional resources in teaching them. The result of findings revealed further that there is significance difference between rural and urban Social Studies learners when using instructional resources in teaching Social Studies. Also the experiment affirmed that there is significant difference between the academic performance of rural and urban social studies learners. When using instructional resources in teaching social studies. The findings also indicated that there was significant difference between academic performance of JSS II and JSS III Social Studies learners when using instructional resources in teaching of social studies.

[17] examined the availability of instructional materials, its adequacy and relevancy; characteristics of instructional materials, importance of instructional materials, and factors affecting the use of instructional materials on students' academic performance in agricultural science. This study made use of Survey Research Design. Thirty (30) Government and private secondary schools were used. It had the population of 8,142



agricultural science students and 73 agricultural science teachers. Sample of 206 students were randomly selected with 30 agricultural science teachers. The instrument used for collection of data was a questionnaire designed by the researcher for the teachers and students of agricultural science. The data collected for the pilot study was used to calculate the reliability coefficient using split-half method and also Pearson Product Moment Correlation Coefficient ( $r$ ), which gave 0.87. Contingency chi-square statistical tool was used in testing the hypotheses at 0.05 level of significance. The analysis yielded the following findings that good and relevant textbooks were the instructional materials available to be used to influence students' academic performance in agricultural science. That instructional materials should possess characteristics of visibility, simplicity, attraction, and clarity. That instruction material is important to influence students' academic performance in agricultural science. That teacher's qualification and experience were the major factors affecting the use of instructional materials to influence students' academic performance in agricultural science in secondary schools. [6] identified school facilities as the main factors contributing to academic achievement in the school system. They include the school buildings, classroom, libraries, and laboratories among others. The author also claimed that the quality, appropriateness and adequacy of these items contribute to performance in the school system. [11] observed that some of the notable factors that may influence students' academic achievement in secondary schools are: school climate, instructional materials discipline, physical facilities, teacher quality, type of location of school and class size. This is because according to [2] schools with a good and conducive environment that has the best type of teachers, instructional materials and physical facilities will produce better school leavers with high achievement. From the forgoing discussion, it can be deduced that school facilities have impact on students' academic achievement. Therefore, this study further identified the contributions of some elements that constitute school facilities and their impact on students' academic achievement in Physics in Adamawa state. These school facilities are: school libraries, classroom facilities and instructional materials.

### Purpose of the Study

The purpose of the study is to determine the relationship between school facilities and Senior Secondary School students' academic performance in Physics in Adamawa State.

The specific objectives of the study are:

1. To examine the relationship between classroom facilities and students' academic achievement in Physics in Adamawa State.
2. To assess the relationship between school library and students' academic achievement in Physics in Adamawa State.
3. To examine the impact of instructional materials on students' academic achievement in Geography in Adamawa State.

### Research Question

The following research questions guided the study:

1. What is the relationship between classroom facilities and academic performance of students in Physics in secondary school of Adamawa State?
2. How does school library relates with student's academic performance of students in Physics in secondary school of Adamawa State?
3. What is the impact of instructional materials on students' academic achievement in geography in secondary school of Adamawa State?

### Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

**H<sub>01</sub>:** There is no significant relationship between classroom facilities and students' academic performance of students in Physics in secondary school of Adamawa State.

**H<sub>02</sub>:** There is no significant relationship between school library and students' academic performance of students in Physics in secondary school of Adamawa State

**H<sub>03</sub>:** There is no significant relationship between instructional materials and students' academic performance of students in Physics in secondary school of Adamawa State



## Methodology

The study adopted correlational research design. The target population of the study is 13,185 SSII Students who are currently offering Physics in senior secondary schools of Adamawa state. The sample for the study comprised 230 Physics students from the selected senior secondary schools in Adamawa State. The instrument for data collection is a structured questionnaire tagged "School Facilities Questionnaire" (SFQ). The instrument contained 15 items and is scored on a five-point scale of Strongly Agree (SA), Agree (A), Neither Agree Nor Disagree (NAND), Disagree (D) and Strongly Disagree (SD). The instrument was duly validated and reliability coefficient of the instrument was obtained to be 0.78 using Cronbach alpha method. The data collected was analyzed using mean, standard deviation and regression analysis.

## Results and Discussion

The research questions were answered using mean and standard deviation while the null hypotheses were formulated using regression analysis.

### Research Question 1

What is the relationship between classroom facilities and academic performance of students in Physics in secondary school of Adamawa State?

**Table 1:** Mean and Standard Deviation of classroom facilities and academic performance of students in Physics in secondary school of Adamawa State

Variable	N	Mean	Std. Deviation
Students' Performance	230	21.5735	28.09651
Classroom Facilities	230	3.5696	1.52760

Table 1 shows the mean and standard deviation of classroom facilities and academic performance of students in Physics in secondary school of Adamawa State. The average mean of classroom facilities is 3.4696 and that of academic performance of students in Physics is 21.5735.

### Research Question 2

How does school library relates with student's academic performance of students in Physics in secondary school of Adamawa State?

**Table 2:** Mean and Standard Deviation of School Library and academic performance of students in Physics in secondary school of Adamawa State

Variable	N	Mean	Std. Deviation
Students' Performance	230	21.5735	28.09651
School library	230	3.3500	1.20511

Result of analysis in Table 2 shows the mean and standard deviation of school library and academic performance of students in Physics in secondary school of Adamawa State. The average mean of school library is 3.3500 while that of Physics students' academic performance is 21.5735.

### Research Question 3

What is the impact of instructional materials on students' academic achievement in geography in secondary school of Adamawa State?

**Table 3:** Mean and Standard Deviation of Instructional Materials and academic performance of students in Physics in secondary school of Adamawa State

Variable	N	Mean	Std. Deviation
Students' Performance	230	21.5735	28.09651
Instructional Materials	230	3.5239	1.50126

Analysis in Table 3 shows the mean and standard deviation of instructional materials and academic performance of students in Physics in secondary school of Adamawa State. The average mean of instructional materials is 3.5239 while that of Physics students' academic performance is 21.5735.



**H<sub>01</sub>:** There is no significant relationship between classroom facilities and students' academic performance of students in Physics in secondary school of Adamawa State.

**Table 4:** Summary of Regression Analysis of Relationship between Classroom Facilities and Students' Academic Performance of Students in Physics in Secondary School of Adamawa State

Model		Sum of Squares	Df	Mean Square	F	p-value	R value	R Square
1	Regression	3387.377	1	3387.377				
	Residual	177388.451	228	778.020	4.354	.038 <sup>b</sup>	.137	.019
	Total	180775.828	229					

a. Dependent Variable: Students' performance

b. Predictors: (Constant), Classroom facilities

Results of Analysis in Table 4 shows summary of regression analysis used to test whether there is significant relationship between classroom facilities and senior secondary school Physics students' academic performance in Adamawa State. The result revealed that there is low relationship between classroom facilities and Physics students' academic performance as indicated by  $r$  – value of 0.137. The results show that there is significant relationship between classroom facilities and Physics students' academic performance,  $F_{(1, 229)} = 4.354$ ,  $p < 0.05$ . Since the  $p$  – value (0.038) is less than 0.05 alpha level, the null hypothesis was rejected. This means that there is significant relationship between classroom facilities and students' academic performance of students in Physics in secondary school of Adamawa State.

**H<sub>02</sub>:** There is no significant relationship between school library and students' academic performance of students in Physics in secondary school of Adamawa State

**Table 5:** Summary of Regression Analysis of Relationship between School Library and Students' Academic Performance of Students in Physics in Secondary School of Adamawa State

Model		Sum of Squares	Df	Mean Square	F	p-value	R value	R Square
1	Regression	343.239	1	343.239				
	Residual	180432.589	228	791.371	.434	.511 <sup>b</sup>	.044	.002
	Total	180775.828	229					

a. Dependent Variable: Students' performance

b. Predictors: (Constant), School library

Results of Analysis in Table 5 show that there is very low relationship between school library and Physics students' academic performance as indicated by  $r$  – value of 0.044. The results show that there is no significant relationship between classroom facilities and Physics students' academic performance,  $F_{(1, 229)} = 0.434$ ,  $p > 0.05$ . Since the  $p$  – value is greater than 0.05 alpha level, the null hypothesis was retained. This means that there is no significant relationship between school library and students' academic performance of students in Physics in secondary school of Adamawa State.

**H<sub>03</sub>:** There is no significant relationship between instructional materials and students' academic performance of students in Physics in secondary school of Adamawa State

**Table 6:** Summary of Regression Analysis of Relationship between Instructional Materials and Students' Academic Performance of Students in Physics in Secondary School of Adamawa State

Model		Sum of Squares	Df	Mean Square	F	p-value	R value	R Square
1	Regression	4094.798	1	4094.798				
	Residual	176681.030	228	774.917	5.284	.022 <sup>b</sup>	.151	.023
	Total	180775.828	229					

a. Dependent Variable: Students' performance

b. Predictors: (Constant), Instructional materials

Results of Analysis in Table 6 show that there is low relationship between instructional materials and Physics students' academic performance as indicated by  $r$  – value of 0.151. The results show that there is significant relationship between instructional materials and Physics students' academic performance,  $F_{(1, 229)} = 5.284$ ,  $p < 0.05$ . Since the  $p$  – value is less than 0.05 alpha level, the null hypothesis was rejected. This means that there is significant relationship between instructional materials and students' academic performance of students in Physics in secondary school of Adamawa State.





### Findings of the Study

The following are the findings of the study.

1. The finding revealed that there is significant relationship between classroom facilities and students' academic performance of students in Physics in secondary school of Adamawa State,  $F_{(1, 229)} = 4.354$ ,  $p < 0.05$ .
2. The finding also revealed that there is no significant relationship between school library and students' academic performance of students in Physics in secondary school of Adamawa State,  $F_{(1, 229)} = 0.434$ ,  $p > 0.05$ .
3. The finding also revealed that there is significant relationship between instructional materials and students' academic performance of students in Physics in secondary school of Adamawa State,  $F_{(1, 229)} = 5.284$ ,  $p < 0.05$ .
- 4.

### Discussion of Findings

The study investigated the relationship between school facilities and Physics students' academic performance in Adamawa state, Nigeria. The following discussions were made regarding the findings of the study. The finding revealed that there is significant relationship between classroom facilities and students' academic performance of students in Physics in secondary school of Adamawa State. This is in agreement with the findings of [7] and who reported that the quality of the physical classroom setting significantly affects academic achievement of the students. Physical facilities in the classrooms ensure effective and successful teaching learning process. Without these facilities, effective and fruitful teaching and learning process is not possible.

In line with this finding, [6] identified school facilities such as school buildings, classroom, libraries, and laboratories as the main factors contributing to academic achievement in the school system. [15] noted that proper arrangement of classroom environment play a remarkable role in making instructional process more effective and establishes an atmosphere favorable and encouraging to learning. Classroom characteristics, such as class composition, students and teacher's characteristics, student's interaction with peers and teachers, classroom values, and classroom beliefs all influence students' academic development.

The finding also revealed that there is no significant relationship between school library and students' academic performance of students in Physics in secondary school of Adamawa State. This finding disagrees with the finding of [3] who established a relationship between library use and students' academic achievement. Anyadike's study revealed that students performed better when they frequently use the school Library than when they do not. The finding also disagrees with that of [14] who reports that schools with well equipped library performs higher than schools where libraries are less developed.

Furthermore, the finding of the study revealed that there is significant relationship between instructional materials and students' academic performance of students in Physics in secondary school of Adamawa State. The finding corroborates that of [17] who found that instruction material had significant influence on students' academic performance in agricultural science. In line with this finding, [16] and [13] documented that students taught with instructional materials performed significantly better than those taught without instructional materials.

### Conclusion

Based on the findings of this study, it can be concluded that classroom facilities and instructional materials enhances students' academic performance. It can also be concluded that School library did not enhance students' academic performance.

### Recommendations

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

1. Well ventilated and furnished classrooms should be provided so as to enhance teaching and learning of Physics.
2. Government should establish more libraries in secondary schools so as to improve the academic performance of the students.



3. The government through the Ministry of Education should make available science instructional materials for use by teachers to enhance students' academic performance.

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