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Impact of School Location on Academic Performance of Science Students in Senior Secondary School Certificate Examination in Nasarawa North Senatorial District of Nasarawa State

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Abstract
The study investigated the impact of school location `on academic performance of Science Students in Senior Secondary School Certificate Examination in Nasarawa North Senatorial District of Nasarawa State. The purpose was to determine whether location has any impact on the academic performance of students in Biology, Chemistry and Physics. The Ex-post facto research design was employed for the study. The target population for the study was 8642 science students of public senior secondary schools in Nasarawa North Senatorial District of Nasarawa State, Nigeria who sat for 2024 NECO examinations. A random sampling technique was employed to sample 12 schools consists of 7 urban schools and 5 rural schools from where a total of 500 science students were used as sample for the study (urban 240 and rural 260 students respectively). The instrument used for the study was a proforma which was used to harvest students results in 2024 NECO examination in Biology, Chemistry and Physics. Two research hypotheses were formulated and analysed using t-test statistical analysis at 0.05 level of significant. It was found that there is a significant difference in the mean achievement score of students in schools located in the urban and rural areas in Nasarawa North District with urban students performed better than their rural counterparts. Based on the findings and conclusion, it was recommended among others that government should provide facilities needed for the teaching of science subjects in rural schools in Nasarawa North Senatorial District of Nasarawa State.
Keywords: School location, academic performance, science students, examination

Introduction

Science has become a critical tool that no nation, developed or underdeveloped, wishing to progress in the socio- economic sphere will afford

to neglect its learning in schools. The development of any nation, which counts on science and technology, hinges on the nation's science education. The quality of science education at all levels primary, secondary and tertiary has a direct impact on a nation ability to compete in the global economy, as well as its capacity to tackles pressing challenges such as climate change, public health crises and sustainable development (DeBoer, 2014; Van Driel, Berry and Meirink, 2014). In the view of Choi, Lee, Shin and Kim (2020), science education is the process of equipping students with fundamental scientific skills, fostering curiosity and positive attitudes towards science, and enabling them to understand the natural world, make informed personal decisions, and engage with the scientific, and technological aspects of society. It therefore, emphasizes inquiry-based learning and the development of scientific thinking rather than mere acquisition of scientific knowledge (Ogunkola and Fayombo 2019). Science education is therefore, a distinct form of creative human activity which involves distinct ways of seeing, exploring and understanding reality. Science, being a fundamental part of everyday life and vital to our understanding of the world, teaches us a way of finding out about the world (by becoming curious and seek explanations) and this helps us to develop a growing body of ideas and information about the ways things work (Osei 2016). Ridwell (2020) stated that science and technology play a crucial role in nation building and development. The reason is that science can maintain a dominant, if not decisive influence on the life of individual as well as on the developmental effort of a country. Some inhibiting factors affecting science subjects learning and hence students' poor academic in science have been identified. Among these factors, include: school location and gender inequality (unugo, 2023).

Location of schools could also be a factor that affects the performance of students in science subjects. Lega (2023) asserted that school location refers to the community in which a school is situated such as hamlet, village, rural or

urban. Some parents believe that academic achievement in rural schools is poor compared with academic achievement in urban schools, and therefore enroll their wards in the urban schools for senior school certificate examinations. In essence, it can be said that the school location and other possible factors may have interrelationship with the students' academic performances in science subjects (Biology, Chemistry and Physics) in rural and urban areas. The impact of school location on academic performance has long been a subject of interest and investigation in education research. Numerous studies conducted worldwide have explored the relationship between school location and students' academic achievement, with varying findings depending on contextual factors and methodologies employed. In Nasarawa State Nigeria, where education is a key priority, understanding the impact of school location on the academic performance of senior secondary school students' is essential for effective educational policy-making and resource allocation. A study by Ose (2021), examined the relationship between school location on academic performance in Basic Technology in Nigerian secondary schools, highlighting the importance of school location in facilitating effective teaching and learning processes. This study provided foundational insights into the Nigerian educational context, emphasizing the need for further research specifically focusing on senior secondary school science students' in Nasarawa State. Bizimana, Mutangana and Mwesigye (2022), research on effects of school location on students' achievement in photosynthesis based on concept mapping instructional strategy, the result showed no significant difference between rural and urban students' achievement taught photosynthesis. Bosede (2020) while studying influence of sex and location on relationship between students' problems and academic performance established that there is not significant relationship between school location and students' academic achievement in mathematics. The study further revealed that gender has a significant influence on students' academic performance. In a more recent study, Unugo (2023) investigated the impact of

school location on students' academic achievement in Social Studies among junior secondary school students' in Abakaliki education zone of Ebonyi State, found that students' who come from rural schools, polygamous family, single parents, uneducated parents performed poorly in their academics. Samuel (2019) research on school location impact on basic science students' academic achievement in junior secondary schools and emphasize that free transportation, adequate instructional facilities and good environment improve the academic achievement of students. However, this study primarily focused on senior secondary school science students' in general, and there remains a gap in the literature concerning the specific impact of school location on academic achievement of students.

The findings underscored the need for targeted interventions to address the challenges posed by school location, particularly in rural areas of Nasarawa North Senatorial District of Nasarawa State. As educational system evolves and face new challenges, it becomes increasingly important to revisit and expand upon existing research on impact of school location on the academic performance of senior secondary school science students' in Nasarawa North Senatorial District, during this timeframe is both timely and relevant. This study aims to build upon existing literature by providing empirical evidence on the impact of school location and academic performance among senior secondary school science students in Nasarawa North Senatorial District.

Statement of the Problem

The academic performance of students' is not the same despite the fact that these students' are taught generally by teachers with about the same qualifications under relatively same condition and are exposed to generally the same educational facilities in schools. The government, teachers, examiners, parents and general public are very much concerned about the significant differences in academic performance of students. The situation is viewed with serious concern,

because human efforts, time and money spent during the process of teaching and learning are not adequately rewarded due to law academic performance on the part of some students. These academic performances depend not only on the educational facilities in the school, students' intelligence quotient, but also on some other important factors of which school location is one of them. The poor academic performances of student in Nasarawa State senior secondary schools from 2023 to 2024 is quite alarming and creates some loss of hope in the public educational system. The National Examination Council (NECO) results of senior secondary schools in Nasarawa State in 2023 for example shows that 40% of science students pass Biology, 36% pass Chemistry and 29% pass Physics respectively. Also in 2024, 38% pass Biology, 39% pass Chemistry, while 34% pass Physics (Nasarawa State Ministry of Education). Having observed the poor performance of the students' in public examinations, one is doubt whether their poor performance is caused by poor family background, students' manner and or more importantly on the school location. It is against this backdrop that this study is conceptualized. This study therefore is seeking to investigate the impact of school location on students' academic performance among senior secondary school science students' in Nasarawa North District of Nasarawa State.

Purpose of the study

1. Determine the level of academic performance of science students in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State by location?
2. Investigate the level of academic performance of science students in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State by gender?

Research Questions

1. What is the level of academic performance of science students in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State by location?

2. What is the level of academic performance of science students in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State by gender?

Hypotheses

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

1. There is no significant difference in the mean achievement scores of science students' in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State based on location.
2. There is no significant difference in the mean achievement scores of science students' in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State based on gender.

Methodology

This study investigated impact of school location on academic performance of senior secondary school science students' in Nasarawa North Senatorial District of Nasarawa State. The ex-post facto research design was adopted for the study. The target population for the study was Senior Secondary School Biology, Chemistry and Physics students who sat for 2024 NECO examinations. The sample for the study consists of five hundred (500) science students from twelve (12) public senior secondary schools randomly selected for the study. The sample is made up of two hundred and forty (240) students from urban schools and two hundred and sixty (260) science students from rural schools where 224 were males and 260 were females respectively. The instrument used for data collection was proforma for extracting relevant information about the candidates across three subjects' areas. The proforma indicates columns for name of school, serial number, gender, school location and students' scores. The instrument was face validated by experts in measurement and evaluation to logical validity of 0.82. The instrument was pilot tested on the school/candidates who were not part of sample population used for the study. The instrument

administered accordingly based on the sample frame to harvest data. Cronbach coefficient alpha was used to get reliability coefficient index of 0.74 for its internal consistency. Descriptive statistics of mean, standard deviation were used to answer research questions and t-test was used for testing hypotheses.

Results

Research Question One: What is the level of academic performance of science students in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State by school location?

Table 1: Mean and standard deviation of science students achievement by school location.

Location	N	Mean	SD	Decision
Urban	240	58.42	17.22	High
Rural	260	57.24	17.92	High

The results of analysis presented on table 1 reveals that students in the urban schools achieve higher in science than their counter parts in the rural schools. This is because the mean of 58.42 obtained by the urban students' is higher than the mean of 57.24 obtained by rural students.

Research Question Two: What is the level of academic performance of science students in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State by gender?

Table 2: Mean and standard deviation of science students' achievement by gender

Gender	N	Mean	SD	Decision
Male	224	58.67	15.84	High
Female	276	57.04	17.19	High

The results of the data analysis presented on table 2 reveals that the level of achievement possessed by male science students' is higher than their female counter parts. This is because the mean of 58.67 obtained by the male students' is higher than the mean of 57.04 obtained by female students, both male and female had high level of achievement. Hence gender is not a determinant of science

students' performance among senior secondary school students in Nasarawa North District.

Testing of Hypotheses

Ho_1: There is no significant difference in the mean achievement score of science students' in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State based on school location.

Table 3: Test for significance difference between the mean scores of science students in urban and rural schools.

Location	N	Mean	SD	DF	t-cal	t-tab	Decision
Urban	240	58.42	17.23	498	1.98	1.96	Rejected
Rural	260	57.24	17.91				

Table 3 shows the t-test on the mean achievement score of science students' of senior secondary school students' in Nasarawa North Senatorial District based on school location. The calculated t-value = 1.98 at 498 degree of freedom in absolute terms is greater than the critical table value of 1.96 at 0.05 alpha level, by implication there is a significant difference in the mean score of students in schools located in the urban and rural areas in Nasarawa North Senatorial District. It was established that students from urban schools performed better than their counterparts in rural schools.

Ho_2: There is no significant difference in the mean achievement score of science in senior secondary schools in Nasarawa North Senatorial District of Nasarawa State based on gender.

Table 4: Test for significance difference between the mean score of male and female science students.

Gender	N	Mean	SD	DF	t-cal	t-tab	Decision
Male	224	58.67	15.84	498	1.04	1.96	Accepted
Female	276	57.04	17.19				

Table 4 shows the t-test on the mean achievement score of science students' of senior secondary school students' in Nasarawa North Senatorial District based on gender. The calculated t-value in absolute terms = 1.04. this

value is less than the critical t-value= 1.96. Since t-calculated is less than the critical t-value at 0.05 alpha level, this means that p=.000 < 0.05 alpha level; by this result, it means that there is no significant difference in the academic performance of male and female science students.

Discussion of Findings

Results on table 3 indicates that there is a significant difference in the mean score of science students in schools located in the urban and rural areas in Nasarawa North District of Nasarawa State. Based on the finding, it is established that students from urban schools performed better than their counterparts in rural schools. This finding affirmed the findings of Ose (2021) and Uguno (2022) who reported that there is a significant difference between the mean score of students in urban and rural with urban students achieved higher in academics than students in rural schools. It was observed that students in urban setting could have more access to libraries, laboratories, etc. than those in rural setting. They asserted that schools in rural areas have poor/no electricity, water supply, inadequate teachers, poor learning facilities and infrastructure. It was further stated that students' who come from rural schools, polygamous family, single parents, uneducated parents performed poorly in their academics.

The results on table 4 revealed that there is no significant difference in the academic performance of male and female science students. The findings further established the homogeneity of male and female students in terms of academic achievement irrespective of school location. In order words, it could be said that the knowledge baseline for the two groups (male and female) are equal. This implies that school location has not any impact on the academic performance of male and female students. This finding disagreed with the finding of Bosede (2020) who found that there is a significant difference in the mean achievement score of male and female students in mathematics. The researcher found that gender has a significant influence on male and female students' academic performance with female students performed better than male students.

Conclusion

Based on the findings, it was concluded that students from urban schools performed better than their counterparts in rural schools in Nasarawa North District of Nasarawa State. It was further proved that school location has not significant impact on academic performance of male and female science students.

Recommendations

The following recommendations were made based on the findings:

1. Government should provide more facilities needed for the teaching of science subjects in rural schools in Nasarawa North District of Nasarawa State. This will enable the students have the same opportunity like their counterpart in the urban schools and thereby enhance student's achievement in science subjects irrespective of the geographical school location.
2. It is the recommendation of this study that government should employ and deploy more science teachers to rural schools to enhance teaching and learning of science subjects.
3. Government should also provide periodic refresher training for teachers particularly those domiciled in schools sited in rural areas to update their knowledge.

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