A COMPARATIVE STUDY OF URBAN AND RURAL SECONDARY SCHOOL STUDENTS ACADEMIC ACHIEVEMENT IN BASIC SCIENCE

by

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Abstract
The study was carried out to compare the academic achievement of urban and rural secondary school students in Basic Science. The area of the study was Awka Education Zone of Anambra State. The design of the study was descriptive design. The population of the study comprised all the JSS2 students of the education zone. Using simple random sampling technique, two hundred and forty (240) respondents were selected from six schools (three urban and three rural schools) in the education zone. A self-designed questionnaire was used in data collection. Three research questions and a null hypothesis guided the study. The data analysis was done using mean, standard deviation and Z-test. The hypothesis was tested at 0.05 level of significance. Results of the findings show that school location has an effect on the academic achievement of students in Basic Science, there is a significant difference between the academic achievement of students in Basic Science in urban and rural schools. Also, there are factors affecting the academic achievement of students in Basic Science in urban and rural schools. Among the recommendation is that government should make appropriate location of schools and also set standard for the employment of teachers. This study will help the school administrators to identify most of the factors affecting students' academic achievement in Basic Science.

Keywords: Comparative, Urban, Rural, Academic Achievement & Basic Science

Introduction

School is one of the social institutions that is responsible for the development and training of the mind and skills of man. The importance of education has been well accentuated in all societies whether developed or developing, ancient or modern. Generally, in the whole world, particularly in Nigeria, education has been considered the corner-stone for development. It forms the basis for literacy, skill acquisition, technological advancement and ability to harness human and material resources towards the achievement of societal goal, (FRN, 2004).

Education is very important in any given society. It is a process by which abilities and capabilities of individual are developed. These abilities might be physical, emotional, social and intellectual. It is the actualization of human potential so that the individual become something more than he was before. According to Ugwuanyi (2003), education is the process by which society establishes to assist the young to learn and understand the heritage of the past, participate productively in the society and contribute meaningfully for the development of the society. Emeka (2008) citing Kneller (2000), sees education as a process by which any society through schools, colleges, universities, and other institutions deliberately transmit knowledge, values, and skills from one person to another. It is as a result of this obvious truth that everyone accords great emphasis to education both in terms of quality and access.

The role of secondary education in national education system cannot be underscored. It is the intermediary level between the primary and tertiary education. It is generally the final stage of compulsory education. Webster (2009), sees secondary school as a school intermediate between elementary school and college usually offering general technical, vocational or college-preparatory courses, while Collins (2003), refers to it as a school for young people, usually between the ages of form of education children receive after primary education and before the tertiary stage. As a midpoint in the pecking order of education, the quality of secondary education predicts and tends to influence the standard of tertiary education and the level of literacy in the country.

School location contributes to the quality of education that students receive. A school could be located in urban or rural area. Rural schools are generally inferior to urban schools as schools in rural areas lacked human and material resources needed for success at schools: The location of school whether urban or rural affects a child's ability to study and perform at the level expected of him. Differences in the location imply differences in the existence of demography and socio-economic parameters of the school. As stated by Imoagene (1998) in Akubue and Ifelunni

(2006), that because of urban involvement, students in urban schools perform better than those in rural schools in language learning. The reason he gave include the fact that rural students have limited access to reading materials, inadequate reading culture and insufficient graduate teachers in rural schools. Therefore, the location of school has tremendous influence on children's academic achievement. A school located in a rural area will have all the characteristics of a rural environment. Similarly, an urban school will have an environment-based activities peculiar to its environment but different from a rural location. Thus, as the school environment differs, the level of academic performance may also differ. The consequence is that the quality of education may not be even; and the national policy on education for a democratic egalitarian society cannot be attained unsentimentally.

Location of a market affects buying and selling, location of a church affects its attendance and participation, location of a hospital measures the extent to which it serves that needs of both the users and the operators. Believing the above is correct and undisputable reality. Little wonder then whether the location of school also contribute to the academic performance of the students. Many schools in the area of education in recent past seemed to have shifted studies from the measures of individual to the measure of the environment. The reason that could be adduced for this trend ranges from the

accurate prediction which measures of environment could bring to learning in order to possible manipulate the environment so as to bring about optional conditions for learning.

For quite some time, a general perception of the comparative inferiority of rural schools has prevailed. This view implies the existence of rural urban differences in students' academic performance. According to Funk and Wagnalls (1993), urban areas are those thickly populated towns or cities with the basic amenities and facilities that make life comfortable while rural areas are those places distinguished from towns and cities with little or no basic amenities or facilities. Urban areas are characterized by high population density, high variety and beauty while rural areas are those with low population, subsistence mode of life, monotonous and burden. Akpan (2008), indicated that schools in urban areas have electricity, water supply, more teachers, more learning facilities and infrastructure. Adebule and Aborisade (2013), assert that students in urban setting could have more access to libraries, laboratories etc. than those in rural setting. The researcher deemed it necessary to compare the academic achievement of secondary school students in Basic Science in rural and urban schools.

Statement of Problem

Basic science is one of the core subjects offered at the junior secondary schools (JSS) in Nigeria. The teaching of the

subject has been faced with numerous problems that can impede the. realization of the objectives. One of such problems is the location of school. The low performance of students in Basic Science has been a major concern to educators. Some researchers have tried to identify some of the problems affecting the teaching and learning of the subject but it seems the problem of low academic performance is a persistent one and has reached a level that should worry everyone concerned with science education in our country. It is therefore, imperative that the state of Basic Science should be re-appraised so that possible solutions could be adduced to remedy the present situation in the teaching and learning of the subject.

Therefore, the researcher's priority is to determine whether school location (urban and rural) constitute the problem affecting the academic achievement of students in Basic Science.

Purpose of the Study
The main purpose of this study is to compare the academic achievement of urban and rural secondary school students in the learning of Basic Science specifically, the study sought to find out:
1. The effect of school location in the academic achievement of students in Basic Science.
2. If there is any significant difference between the academic achievement of students in Basic Science in urban and rural schools.
3. The factors affecting the academic achievement of students in Basic Science in urban and rural schools.

Significance of the Study
The findings of this study will be of immense benefit to the government, education planners and administrators, school guidance counselor, educators and teachers, parents and students. The findings will be of great help to the government at both state and federal levels in making special provision to bridge the gap, if any, in the academic achievement that may be resulting from difference in school location, thereby, encouraging them to device means of improving learning environment so as to motivate students to higher academic achievement irrespective of school location.

The outcome of this study, if published may be useful to the Ministry of Education which is the organ of government making decision on recruitment of Basic Science staff. To the curriculum planners, the findings of this study may encourage them to produce better curriculum materials for Basic Science. The findings of this study if published or disseminated through conferences and seminars, could be of benefit to the school guidance counselors by giving them better understanding on the influence of school location on the academic achievement of students in Basic Science. It will place the school guidance counselors in better position to

device improved counselling strategies, which in the long run, will result in adopting more appropriate strategies in counselling services towards achieving maximally in Basic Science.

To Basic Science teachers, the findings of this study, if disseminated through teacher's workshop, will likely make them better informed of the influence of school location on the academic achievement of students in Basic Science. Thus, appropriate teaching method and techniques will be employed in the teaching and learning of the subject. Both the students and parents will benefit since the cumulative positive effect of the responses from the government, school administrators and guidance counselor are to their own advantage.

Scope of the Study

This study is limited to the Junior Secondary' School, 2 (JSS2) students in Awka Education Zone of Anambra State. In terms of the content, the study is limited to comparative study of urban and rural secondary school student's academic achievement in Basic Science.

Research Questions

In other to meet the objectives of this study, the following research questions were formulated to guide the study.
1. What are the effects of school location-on the academic achievement of students in Basic Science?
2. Is there any significant difference between the academic achievement of students in Basic Science in urban and rural schools?
3. Are there factors affecting the academic achievement of students in Basic Science in urban and rural schools?

Research Hypothesis

One null hypothesis guided the study.
Ho: There is no significant difference between the academic achievement of urban schools' students and rural schools' students in Basic Science.

Research Design

The researcher used descriptive design of survey type. It is to provide opinion of the respondents on the influence of school location on the academic achievement students in Basic Science. Nworgu (2006), defines descriptive survey design as those studies that aim at collecting data and describing them in a systematic way, the features of a given population. The design is considered appropriate because it will enable the researcher to identify the characteristic of the population objectively.

Area of Study

This study was carried out in Awka Education Zone of Anambra State. The education zone includes the following five local government areas: Awka south, Awka North, Anaocha, Dunukofla and Njikoka Local Government Areas. Two local government area were selected for

the study. They include Awka South and Awka North Local Government Area.

Population of the Study

The target population for this study was made up of public secondary school students in Awka Education Zone of Anambra State, Nigeria, who were in Junior Secondary school, class two (JSS2).

Sample and Sampling Technique

The sample size for the study, comprised of two hundred and forty (240) students. Three schools were randomly chosen from urban areas and three school were also randomly chosen from rural areas. In each school, 40 students were randomly selected making a total of 240 students. The random choosing of schools was done from the two selected local government that is Awka South and Awka North Local Government Areas.

Instrument for Data Collection

The instrument used for data collection was a self-designed questionnaire called Academic Achievement Questionnaire (AAQ). Part A was designed to collect information on background characteristics of respondents. Part B centered on 15 items meant to answer the research questions poised for the study. The adopted instrument was rated on a 4-point Likert scale structured in the following order, SA = Strongly Agree, A = Agreed, D = Disagreed, SD = Strongly Disagree.

Validation of the Instrument

The instrument was subjected to face validation by three experts; the supervisor, one science education lecturer and one expert in Measurement and Evaluation. The experts were asked to look at the adequacy of the items in line with the purpose research questions as well as the rating scale. They are also to comment on the language level, clarity of expression, appropriateness of the instrument to the level of the students and arrangement of the items. Their suggestions were used in modifying the items on the questionnaire. Corrections were affected in some of the items and on the response options.

Reliability of the Instrument

To ascertain the reliability of the instrument, a trial test was carried out. The instrument was administered to thirty (30) JSS2 Basic science students from a school in Anambra East Local Government Area of Anambra State, outside the study area, but were equivalent to the group, for which the instrument was developed. Their scores were used to calculate the coefficient of reliability.

Administration of the Instrument

Direct method was used to administer and collect the instrument by the researcher and a trained research assistant. She helped in the administration and collection of the questionnaire after completion by the respondents. The reason is to ensure a high return rate of the instrument.

Method of Data Analysis

Mean and standard deviation were used to answer the research questions and z-test was used to test the null hypothesis. Based on the 4-point Likert scale of the instrument. The criteria mean which determined the acceptance level is 2.50 and above while 2.49 and below is the rejection level.

Presentation and Analysis of Data

This chapter deals with presentation and analysis of data collected from the respondents. The analysis is based on the research questions.

Research Question One: What are the effects of school location on the academic achievement of students in Basic science?

Table 1: It shows the mean responses of the effect of school location on the academic achievement of students in Basic science.

S/N	ITEMS	SA	A	R	SD	X	Remark
1	Noisy school environment hinders learning.	93	88	37	22	3.05	Accepted
2	Poor road structure hampers students and teachers punctuality to school.	70	98	40	32	2.80	Accepted
3	Quiet environment improves teaching and learning very.	102	60	40	38	2.94	Accepted
4	Schools in towns and cities increases the students opportunity for technological advancement.	60	100	50	30	2.79	Accepted
5	Inadequate land area in schools prevents the installation of educational facilities.	82	88	30	40	2.88	Accepted

Considering the analysis in the above table 1, items 1-5 with their corresponding means of 3.05, 280, 2.94, 2.79 and 2.88 respectively were all accepted because they were above the acceptance level of 2.50. Therefore, the result shows that noisy school environment hinders learning, poor road structure hampers students and teacher's punctuality to school, quite environment makes teaching and learning effective. Also, schools in towns and cities increase the student's opportunities for technological advancement. Inadequate land area in schools reduces the installation of educational facilities.

Research Question Two: Is there any significant difference between the academic achievement of students in urban and rural schools?

This research question is converted to research hypothesis, thus;

HI: (Alternative Hypothesis) There is a significant difference between the academic achievement of students in urban and' rural schools.

(Null Hypothesis) HO: Nur = Nru (Population means are equal)
(Alternative hypothesis) Ha: Nur < Nru (the first population mean is less than the second population mean)
To address this hypothesis, table is presented below using
Z- test. The formula for calculating Z-test is given as

$$Z = \frac{X_{1-X_2}}{\sqrt{\frac{S^2}{n_1}+\frac{S^2}{n_2}}}$$

Where
X_1 = the mean of the first group
X_2 = the mean of the second group
S^2_1 = the standard deviation of the first group
S^2_2 = the standard deviation of the first group
n_1 = the total number of the first group
n_2 = the total number of the second group

Table II: Table Showing the Mean and Standard Deviation of Students Academic Achievement in Urban and Rural Schools.

Location	Mean	Standard Deviation	Number of Students
Urban	13.37	5.27	120
Rural	10.76	4.90	120

Substituting the values in the equation of Z we have

$$Z = \frac{Xur-XR_u}{\sqrt{\frac{S2ur}{nru}+\frac{S2_{Ru}}{nRu}}}$$

$$Z = 13.37 - 10.76$$

$$\frac{2.61}{\sqrt{\frac{5.27^2}{120}+\frac{4.90^2}{120}}}$$

$$\frac{2.61}{\sqrt{\frac{27.77}{120}+\frac{24/01}{120}}}$$

$$\frac{2.61}{\sqrt{0.2314 + 0.2000}}$$

$$\frac{2.61}{\sqrt{0.4314}} = \frac{2.61}{0.6568}$$

Z = 3.9738
Therefore, the calculated Z =3.9738

The critical value of Z - test for a two tailed test at 0.5 significance level is = 1.960. The decision rule states that, reject Ho if the calculated Z is greater than the critical otherwise, do not reject Ho.

Therefore, here, the calculated z which is 3.9738 is greater than the critical value for Z. We then reject the Ho (Null hypothesis) and therefore accept the alternative hypothesis (Ho).
Thus, there is a significant difference in the academic achievement of students in Basic Science based on their location (Urban or Rural).

Research Question 3: Are there factors affecting the academic achievement of students in Basic Science in urban and rural schools?

Table III: Table Showing the Mean Responses of the Factors Affecting the Academic Achievement of Students in Basic Science in Urban and Rural Schools

S/N	Items	SA	A	D	SD	X	Remark
11.	Overcrowded classroom hinders active participation of students during Basic Science lesson.	110	6	20	34	3.09	Accepted
12.	Unavailability of Basic Science reading materials affects students' academic achievement.	90	60	40	50	2.79	Accepted
13	Home and school environments affect students' academic achievement in basic science.	77	*S3*	43	37	2.83	Accepted
14	Teaching methods used by Basic Science teacher also affect learning of basic science.	102	60	40	38	2.94	Accepted
15	Poor reading habit contributes to low academic achievement of students in Basic Science.	93	88	37	22	3.05	Accepted

In table III above, items' 11,12, 13, 14 and 15 with their corresponding mean of 3.09, 2.79, 2.83, 2.94 and 3.05 were all accepted because they were above the criteria mean of 2.50. The results show that the factors affecting the academic achievement of students in Basic Science in urban and rural schools include; overcrowded classroom, unavailability of Basic Science reading materials, home and school environment, teaching methods and poor reading habit.

Summary of the Findings
The summary of the major findings is as follows:
1. School location has an effect on the academic achievement of students in Basic Science. Thus, noisy environment hinders learning, poor road structure hampers students and teacher's punctuality to school, quite environment improves teaching and learning, schools in towns and cities avail the student's opportunities for technological advancement. Also, inadequate land area in schools prevents the installation of educational facilities.
2. The decision rule in research question 2 states that, reject Ho, if the calculated Z is greater than the critical Z, otherwise, do not reject Ho. Since the calculated Z which is 3.9738 is greater than the critical Z, = 1.960, we reject the null hypothesis (Ho) and accept the alternative Hypothesis (Ha).
3. **Decision**: The researcher therefore took decision thus, "there is a significant difference between the academic achievement of students in

basic science in urban and rural location.

4. The result in research questions 3 shows that there are factors affecting the academic achievement of students in basic science in urban and rural school such as overcrowded classroom, unavailability of Basic Science reading materials, home and school environment, teaching method and poor reading habit.

Discussion of the Findings

The discussion of the findings is based on the questions already stated. Effect of school location of the academic achievement of students. The result of this research question revealed that the respondents agreed that noisy environment hinders learning, poor road structure hampers students and teacher's punctuality to school, quiet environment improves learning, schools in towns and cities increases the student's opportunity for technological advancement and inadequate land area prevents the installment of educational facilities. The findings above underscore the need to locate schools away from noisy environment, proper construction of roads leading to schools, use of technological instrument in teaching Basic Science in schools, and mapping out adequate piece of land for schools so as to ensure installation of educational facilities.

Difference in Academic Achievement of Students in Urban and Rural Schools

Based on this research question, from the mean responses of the students in the questionnaire items, the researcher observed that students in urban schools perform better in basic science than those in rural schools because they have more qualified teachers. Urban school students are always given basic science assignment which improves their academic achievement, they have more time to study than those in rural schools, rural schools are not disturbed by noise in the environment. Most importantly, urban school students have high academic achievement than those in rural schools because of their educational background. It is clear that many parents are farmers while some are teachers.

Factors that Affect Academic Achievement of Students in Basic Science

The findings from this research question revealed that overcrowded classroom, unavailability of Basic Science reading materials, teaching methods, home and school environment, and poor reading habit are some of factors affecting academic achievement of students in Basic Science.

Suggestion for Further Studies

Based on the findings, the researcher suggested that further studies be carried out on this topic to find out other factors that are responsible for the low academic

achievement of students in Basic Science especially in rural schools.

Recommendations

From the findings of this study, the following recommendations were made:

1. Both government and communities should ensure schools are built away from noise source such as industry, market, church, busy roads, etc.
2. Government should ensure that schools are accessible for students and teachers especially in rural areas by construction of good roads.
3. Individuals and government should assist schools especially those in rural areas with the new technologies used in teaching learning process such as computers, projectors etc to improve learning.
4. Government should set a standard for employing teachers especially Basic Science which is the foundation for other science subjects.
5. Teachers should make effort to give students assignment always develop their intellectual abilities,
6. There should be seminar for parents in rural areas on the need to support their children in their education by providing them with basic educational materials especially in Basic Science. They should also, encourage their children by given them more chance to study at home.
7. Teachers should always engage the students in practical works as

children learn more from what they do than what they hear.
8. The guidance and counselors in schools should inculcate the best study habit in the students for effective learning.

Conclusion

The researcher has identified the differences in the academic achievement of students in Basic Science in urban and rural schools. The researcher found out that students in urban schools perform better in Basic science than those in rural schools. Thus, efforts should be made by government and concerned individuals to upgrade the standard of students in rural schools so that students in rural schools should not feel too inferior amidst their counterpart from urban schools.

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