AVAILABILITY OF LABORATORY AND BOARDING FACILITIES AND STUDENTS' ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN RIVERS STATE

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Abstract
This study examined the relationship between Laboratory and Boarding facilities and students' academic performance in public secondary school in Rivers State. To carry out this task, two research questions and two hypotheses were formulated. The design adopted was ex-post facto design. Simple random sampling technique (SRS) was used to select 500 respondents comprising of SS1 and SS2 students. The instrument used for the research was School Infrastructure and Students' Academic Performance (SISAP). After subjecting the instrument to the Pearson Product-Moment Correlation, a reliability index of 0.84 was achieved. Pearson Product-Moment Correlation was used to answer the two research questions, while z-ratio was used to test the two hypotheses at 0.05 level of significance. The findings showed that a low positive relationship existed between laboratory and boarding facilities provision and students' academic performance in public secondary schools in Rivers State, Nigeria. Based on the findings of the study, the researchers recommended other variables such as the teachers' qualifications, and the teaching methodologies, among others should be further investigated as correlates of students' academic performance, since the present study established no significant relationship.

Introduction

Education is a sustainable means for human enlightenment and industrial revolution in the world. It affords the society opportunities of having desired changes and modernisation, hence it is seen as the most powerful weapon of social change. Through education, youths are groomed and given a skill which helps them become breadwinners of their family. Education brings about changes in the economy of a nation, political sphere and the structures in the society as a whole. It functions as an integrating force that produces a positive change. It is an instrument for development in virtually all sectors of

life. Education brings about scientific and technological advancement in any society. Without education, the pace of development in a society is impeded. Hence, it is the concern of any government as it is a means of satisfying the people's needs. Skills and vocations are taught in education (Ezekiel-Hart and Adiele, 2010).

Academic performance is the outcome of educational process. It is the extent of achievement of the educational goals of the students, teachers and the institution. An institution's achievement is measured by its academic performance. The quality of education the students receive is determined by their performance in the final examination. To Santrock in Nuralafizan (2012) academic performance refers to what the students have learnt or skills they have acquired through learning measures, through assessments like standardized tests, performance assessments and portfolio assessments**.** One vital target of a school is academic performance measured by examination results. In this study, academic performance is considered as the SS1 and SS2 students' promotion examination results for English and Mathematics in 2016 in Rivers State.

The Functionalist theory propounded by Durkheim and Parsons (1961) is suitable for this research work. This theory identifies the unique roles of education. It considers the social functions of each structure and the consequences of a social pattern for the operation of the society as a whole. The theory considers education to be a way of socialization that has to do with gaining expertise and understanding. The theorists investigate the purpose of education in the entire society and the functional relationship between education and aspects of the social system. They equally seek to recognise the input of education towards maintaining the consensus value and social solidarity and the way it promotes the economic growth and serves as tools which integrates the society. The theory focuses on the meaningful contributions education makes to preserve the social system. Durkheim and Parsons went further to highlight the purposes of education as it has to do with gaining understanding and learning skills. Consequently, a number of material provisions/resource, some of which are examined further in this study, are required for the objectives of the school to be achieved at any point in time.

A school laboratory is an important and an integral part of the educational system. It is quite essential for obtaining qualitative and quantitative education. The presence of a laboratory in a school influences efficiency and high productivity. Ango in Owoeye and Yara (Internet, 2011) asserts that a laboratory serves the following functions:

i) Stimulates the interest of learners as they participate in scientific activities and experiments.

ii) Learners are taught the basic skills and scientific methods of solving problems.
iii) Practical knowledge acquired through works in the laboratory is long lasting in the learner's memory.

Balogun in Usen (2016) asserts that the effectiveness of science education is largely dependent on the availability of necessary equipment. He further argues that these facilities are vital as they support the teacher and students develop problem-solving skills and scientific attitude. To Ogundele (2012), the laboratory is a place where empirical scientific and other related concepts are learnt through series of experiment and practical work. Hence, laboratories are important learning facilities that should be present in every school and should be equipped with facilities, knowing their importance.

Mokaya (2015) found in Kenya that laboratory equipment was lacking in schools. Similarly, Nwachukwu in Owoeye and Yara (Internet, 2011) investigated and found that the resources for the teaching and learning of Biology in new secondary schools in Lagos State were lacking. Akpan in Neji, Ukwetang, and Nja (2014), in a study to ascertain the adequacy of laboratory facilities, using frequency count and percentages equally found that laboratory facilities for teaching Chemistry were inadequate. Udo (2010) reports that science practical work is essential and science education cannot exist without practical work.

The role of laboratory for the success of an academic system is quite enormous. Knowledge is acquired as students carry out experiment. In the laboratory, scientific practices and applications are made more meaningful as they are carried out practically and the results arrived at after the tests are carried out. Yadar in Owoeye and Yara (Internet, 2011) observed that no course in the sciences and mathematics could be satisfactorily taught, without a practical or experimental analysis either in science laboratory or in the classroom. Similarly, UNESCO in Usen (2016), observed that practical or experimental work are essential to the study of mathematics and other science courses. It further observed that practical teaching and learning have a positive relationship with academic achievement. They argued that an object used in practical work leaves an impression on the mind than merely seeing that object from a distance.

Laboratory is essential for teaching in the sciences as it involves an investigation to ascertain the validity of what the student has leant. It is important for the teaching and learning process to be successful.

Eshiet in Neji, et. al. (2014) observes that adequate laboratory facilities enhances the teaching of Chemistry and equally stimulates students' desire to

learn. This, in turn, boosts the academic performance of the students. Bello (2012) studied the effect of availability of physics laboratory equipment on students' educational achievement and found that laboratory equipment had direct effect on students' academic performance. Ayubayi in Owoeye and Yara (Internet, 2011), in a comparative study on correlates of school extrinsic variables with students' academic attainment in science, in Bendel State found a positive relationship between laboratory facilities, science books in the library and students' academic achievement in Physics, Chemistry and Biology. Udo (2010) found that schools with a well-equipped laboratory performed better than schools without science equipment in their school certificate science examinations. Similarly, in another study, Danjuma and Adeleye (2015) supported this assertion that teachers who utilized laboratory apparatus in teaching physics positively influenced students attitude towards physics and this could indirectly affect students' academic achievement. This supports the common knowledge that research work in the sciences are more real when put to practice.

On the contrary, Okeke in Neji, et. al. (2014), in another study of the adequacy of laboratory facilities in secondary schools did not find any significant relationship between laboratory and students' academic performance. Aburime in Neji, et. al.'s (2014) findings in a different study equally agreed with Okeke that no significant relationship was found between laboratory facilities and students' academic performance in Chemistry. Other research reports with similar results include those of Okafor in Neji, et. al. (2000), Akpan in Nejiet. al.(2014) and Neji et. al. (2014).

Boarding school is a school where some or all the students study and live with their fellow students, sometimes with teachers and principal, during the school year, within or outside the school premises. The accommodation is usually provided by the school and in each case, the students are subjected to the rules and regulations governing a boarding house. Boarding schools have the advantage of enabling students to be independent and responsible and these help the latter to become successful in life. Many parents today are hyper-vigilant and strive to be involved in all aspects of their children's up-bring, believing that a boarding school is an antidote to this. Students in the boarding house are expected to do their laundry themselves as well as navigate through other activities, since their parents do not have the opportunity to shield them from performing their assignments. Consequently, the boarding school builds in the child the ability to manage his life. Again, a boarding student does not only learn to manage his/her affairs but equally learns and interacts with others and accommodate them. These exposures make a student strong and capable of developing self-initiative and leading others.

Furthermore, boarding school creates an enabling environment for students and teachers to connect and it fosters more intimate relationship between the two groups. According to a research report by the Association of Boarding Schools, boarding students enjoy the following advantages Mahinay (2014:13):

- Exposure of students to leadership.
- Students enjoy structure and use their time judiciously. This makes them more productive in terms of the academic output.
- Majority of the students are well prepared for higher institutions.

Boarding facilities aid students' academic performance since they are far away from home and will not have to do the home chores that usually consume the time for studies. Okeke (2016) observed a positive influence between boarding resources and students' academic performance. Dermie, Lewis, Maclean and Diriye in Bahadar, Mahnaz and Jadoon (2014) carried out an investigation on the poor performance of Somali pupils who had less accommodation in the United Kingdom. A typical Somali family is made up of six children, hence to provide space for the children and make available study materials for them at home was not easy. Dermieet. al., reported poor performance of the Somali students because of lack of parental support. Boarding students were aided in their academic work by their teachers during prep hours. Day students were sometimes not assisted by their parents in their academic work and were sometimes too occupied with house chores that they had little or no time to concentrate on their school work. In the same vein, Jagero, Oloo and Mackenzie in Bahadaret. al. (2014) in Kenya investigated the major factor that affected academic achievement of students in their area of study and discovered it was their home environment that was not conducive for reading due to excess house chores.

Hinnum and Park in Bahadaret. al (2014) in their study also found out a positive correlation between resource materials and performance at home in China. The result revealed that students at home lacked study materials, which in turn, negatively affected their academic achievement.

Again, the distance between the school and the homes of the students could be a militating factor against the students' academic performance, if the proximity of the school from their homes is far. They are likely to be late to school and tired, while returning home as well. This scenario could negatively affect their studies and outcome in school. Coady and Parker in Bahadaret. al (2014) in Mexico found that long distance from school was a reason for lateness. If a student is late to school, there is every tendency that he might miss some morning lessons. Similarly, Malenya (2008) in rural Africa also

found that long distance was a reason for lateness to school. Long distance makes students tired and gives them less motivation to study. Equally, it could be a form of discouragement to students living far from their school environment. Fatigue could set in after a long walk to the school. Mwinzi and Kimengiin Bahadaret. al found that absenteeism and missing classes made students have piles of work to cover up and this could cause discouragement which leads to failure in their academics. Parents consider this situation to be burdensome on their children and decide on sending them to live in the boarding house. Chansarkar and Mishaelond in Mahinay (2014) found that those who lived near their academic environment perform better than the others who lived far. Rainfall, accident, in addition to some unforeseen circumstances that may arise are some variables that can hinder students from a far distance from getting to school on time.

In spite of the strategic role of education in society and the need for essential variety of related infrastructural provisions, one could observe in public secondary schools in Rivers State that the science laboratories are without science equipment. Many schools that previously had boarding facilities can no longer boast of earlier provisions presently. The Central Bank of Nigeria in Ige (2012) reports that many secondary schools in Nigeria lack infrastructure such as textbooks, laboratories and workshops for practical works. However, the government of Rivers State, under the leadership of Rt. Hon. Chubuike Ameachi, in attempt to proffer solution to these issues built 24 Model Secondary Schools and over 300 Model Primary School (Change Agent, 2014). In spite of this effort, there are still many schools without essential infrastructural resources. Government claims to have spent large sums of money on the renovation of schools and provision of school resources. Meanwhile, it is also claimed that many billions of Naira have been spent on window dressing renovation of school buildings but there still exists empty classrooms and non-provisions of other relevant school resources such as laboratories equipment, boarding facilities, books for the libraries, medical facilities, among others. It was sometimes reported that some contractors refused to carry out their works, yet nothing was done to them (Ololube, 2016). Parents are worried about the state of Rivers State public school, knowing that their children are at the receiving end and the existing scenario could be part of the reasons their children's performance is poor. It is in the light of the forgoing observations that the researchers desire to investigate the relationship between the provision of laboratory facilities, boarding facilities and students' performance in public Secondary Schools in Rivers State.

The research questions and two hypotheses guided the study:

1. What is the relationship between available laboratory facilities and students' academic performance in public schools in Rivers State?
2. What is the relationship between available boarding facilities and students' academic performance in public schools in Rivers State?

The following null hypotheses were postulated and tested:

There is no significant relationship between available laboratory facilities and the students' academic performance in public secondary schools in Rivers State.

There is no significant relationship between available boarding facilities and students' academic performance in public secondary schools in Rivers State.

Method

The research design adopted for this study was the Ex-Post facto (Okorodudu, 2013). The design was suitable for the study because this method tests antecedent of events that already occurred which the investigator could not engineer, control or manipulate. This study was carried out in Rivers State. This research work was limited to 10 secondary schools from the three (3) Senatorial Zones in Rivers State. The population for the study consisted of 61,416 students from Senior Secondary section of public secondary schools, in Rivers State. It comprised both male and female youths within the ages of 13 - 16 years, in SS1 and SS2 classes. (Rivers State Senior Secondary Schools Board, 2016).

The sampling technique adopted for the study was the simple random technique (SRS), According to Krejcio and Morgan in Sekaran (2003), a minimum sample of 381 could be used for a population of up to 60,000. Hence, 500 students were drawn from ten (10) public senior secondary schools in the three Senatorial Zones in Rivers State, out of which five (5) urban schools and five (5) schools in the rural area were drawn. The instrument developed by the researchers was a 36-item questionnaire as well as the SS1 and SS2 students' promotion examination results for English and Mathematics in 2016 in Rivers State. The instrument was tagged "School Infrastructure and Students' Academic Performance (SISAP) Questionnaire". It consisted of two parts - A and B. Part A was developed to solicit information on biographical information of the respondents, while part B contained items that addressed the variables of the study. The questionnaire was patterned on a 4-point Likert-Type scale weighted as follows: Strongly Agree (SA) = 4 points, Agree (A) = 3points, Disagree (D) = 2points and Strongly Disagree (SD) = 1point.

The face and content validity of the instrument was ascertained by experts in the Department of Educational Foundations. Their comments and suggestions were used to develop a valid instrument used to obtain the responses from the research subjects. On the other hand, the researchers determined the reliability of the instrument by adopting the test-retest reliability technique. The two sets of the instrument obtained from the test re-test were correlated, using the Pearson product-moment correlation and the reliability coefficient of 0.84 was obtained. The data collected were presented in tables and analysed, using the Pearson product-moment correlation, to answer the research questions, while z-ratio was used to test all hypotheses at 0.05 level of significance with 498 degree of freedom.

Results

Table 1: Summary of Pearson Product-Moment correlation coefficient and z-test of the relationship between available laboratory facilities and students' academic performance in Rivers State

Categories	N	Df	r-cal.	z-ratio	z-crit.	Decision
Available laboratory facilities Vs Students' academic performance	500	498	0.038	0.63	1.96	Not statistically significant

Co-efficient of determination = 0.14

Table 1 revealed that the r-value is 0.038, indicating a low positive relationship between available laboratory facilities and students' academic performance in public secondary schools in Rivers State. Further analysis for the co-efficient of determination yielded 0.14 confirmed the very low relationship. The significant relationship between laboratory facilities and students' academic performance, was tested at 498 degree of freedom (df). The calculated z-ratio yielded 0.63. At 0.05 critical level, the calculated z-ratio is lower than the z-critical (1.96). Hence, the Ho1 is accepted, meaning that there is no significant relationship between available laboratory facilities and students' academic performance in public secondary schools in Rivers State.

Table 2: Summary of Pearson Product-Moment correlation coefficient and z-test of the relationship between available boarding facilities and students' academic performance in Rivers State

Categories	N	df	r-cal.	z-ratio	z-crit.	Decision
Available boarding facilities Vs Students' academic performance	500	498	0.008	0.133	1.96	Not Statistically significant

Co-efficient of determination = 0.01

Table 2 revealed that the r-value is 0.008, indicating a low positive relationship between available boarding facilities and students' academic performance in public secondary schools in Rivers State. Further analysis for the co-efficient of determination yielded 0.01 confirmed the very low relationship. The significant relationship between boarding facilities and students' academic performance, was tested at 498 degree of freedom (df). The calculated z-ratio yielded 0.133. At 0.05 critical level, the calculated z-ratio is lower than the z-critical (1.96). Hence, Ho2 is accepted, meaning that there is no significant relationship between available boarding facilities and the students' academic performance in public secondary schools in Rivers State.

Discussion

The findings in this study unveils that laboratory facilities have no significant relationship with students' academic performance in public secondary schools in Rivers State. Earlier findings of Okeke's study in Neji et al. (2014) supports the present findings. Equally, Neji et al. had similar findings as they found no significant relationship between laboratory resources and students' academic performance. On the other hand, Arubayi in Owoeye and Yara (2011)'s findings are in contrast to the findings of this study. He found a positive significant relationship between laboratory facilities and students' academic performance. Udo (2010) equally supports Arubayi's findings as he found that schools that had well-equipped laboratory had a better performance, compared to those without.

Again in Rivers State, this study found no significant relationship between available boarding facilities and students' academic performance. On the contrary, in their earlier studies, Chasarkar and Mishaelondis in Mahinay (2014) found a positive significant correlation between boarding facilities and students' academic performance. Their findings are in consonance with those of Hinnum and Park in Bahadar et. al (2014) who also found that students at

home lacked study material and that in turn affected their academic performance. It is likely that the scarcity of essential boarding facilities such as enough bed space and lighting facilities, in this study have contributed to a very low relationship between school infrastructural facilities and students' academic performance that have not been found significant.

Conclusion

The result of the findings of this study confirms that the provisions of laboratory and boarding facilities have a minimal effect on students' academic performance in public secondary schools in Rivers State. Invariably, there are other variables that must have contributed to poor students' academic performance which are yet to be determined presently in Rivers State.

Recommendations

The Rivers State government should ensure that it replaces worn-out school infrastructural facilities on regular bases. The laboratory equipment should be provided and replaced when the need arises. More importantly, the influence of teachers' qualifications and methodology should be examined as well as other variables as they could positively relate to students' academic performance.

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