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Influenceof School Environmental Factors on Science Students Academic Performance in Physics in South West Local Government Area, Ibadan

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Abstract

The study examined school environmental factors (Library facilities, Laboratory facilities, Classroom, School location, Recreational facilities, Qualified and experienced teachers) and students' academic performance in Physics in South West Local Government Area, Ibadan, Nigeria. School environmental factors can influence the academic performance of science students in Physics.

A descriptive survey research design was adopted for the study. Two instruments were used to carry out the research: School Environmental Questionnaire (SEQ) and Physics Achievement Test (PAT). Simple random sampling technique was used at selected five (5) secondary schools. From the five (5) selected schools, thirty (30) Physics students were randomly selected from each of the selected schools, giving a total of one hundred and fifty (150) students. This was to ensure good representation of the selected schools.

The results revealed that all the school environmental factors studied have significant composite contribution to students' academic performance. 64.5% of the variance in students' academic performance was explained by school environmental factors. Five (5) of the environmental factors were

significant at 0.05 level, when the relative contribution of each factor was considered, while the rest were not.

The study has implications for Ministries of Education, Educational stakeholders and School Managers/Principals. The Ministries of Education and Educational Stake holders should endeavor to equip the schools with necessary facilities. The school managers/principals should ensure that the facilities are put in effective use and maintained.

Key Words: Performance, School location, Library, Classroom, Laboratory

Introduction

Technology is the in thing in the world today. One cannot be technologically competent without some basic science subjects such as Physics. Though physics is very important for technological advancement, it is unfortunate to note that students do not do well in the subject generally (Iroegbu 1998, Okoronka 2004, Babajide 2010)

Researches have shown that some school environmental factors may affect the academic performance of students in Physics (Oluchukwu 2000, Ajayi 2007). School environmental factors, which include the classrooms, laboratories, technical workshops, libraries, teachers' quality, school management, teaching methods, peers, location affect students' academic performance in one way or the other (Ajayi, 2007 and Oluchukwu 2000).

Inadequate classroom whereby the students do not have chairs and tables to sit on and write could have negative influence on the students' academic performance. A congested classroom with little or no ventilation could have adverse effect on students' rate of assimilation and could lead to poor health among students. This could also lead to poor performance and high rate of absenteeism (Frazier 2005, Lyons 2001, and Ostendorf, 2001).

Inappropriate school location could affect students' academic performance. For example, a school located in a market place could be too noisy for teaching and learning to take place. Also, a school located on the busy road is likely to have negative effect on the students'

performance because every little noise from moving vehicles is likely to distract the students.

A school without a functional laboratory may have adverse effect on students' academic performance. Students may have to study physics without coming in contact with the Physics materials and even knowing how those materials look. Since children learn better using their senses of touch, sight, smell, taste etcetera, it will not be surprising if such children perform below expectation.

Library facility is an important factor that may affect students' academic performance. Students need to consult books of past scientists and their findings and be able to relate them to their own findings. They need the encouragement which comes from the patience of the past scientists. Where the library facility is not available the students may be discouraged. A school environment should be one in which every student feels safe. This is because the physical characteristics of the school have a variety of effects on the teachers, students and learning processes. The primary purpose of the school is the academic development of students. But the effects of school environment are broad and encompass the students' physical and mental health, safety, civic engagement and social development.

According to Chan, (1996), Poor learning facilities can foster negative attitudes just as exceptional designs may boost achievement. Where the instructional spaces such as classrooms, libraries, technical workshops and laboratories structurally defective, the students' academic performance may be affected negatively. Where the classroom is overcrowded, the health of both the teachers and students may be affected. It is only healthy students that can learn and only healthy teachers that can teach effectively. Most of our secondary schools are crowded with little or no infrastructural facilities. Most secondary schools do not have Libraries and Laboratories. Where these exist, they will just be empty buildings without books and materials. Some schools do not have classrooms. Where it exists, there is no proper ventilation. Some schools are located in noisy environment such as market places and near busy roads.

Statement of the Problem

School environment is an essential part of educational planning. Unless schools are well sited, buildings adequately constructed and equipment adequately utilized and maintained, much teaching and learning may not take place. High levels of students' academic performance may not be guaranteed. Where instructional space such as classrooms, laboratories, libraries, technical workshops is structurally defective much learning may not take place and hence academic performance may be low. Structural effectiveness, proper ventilation and well sited instructional space may lead to successful teaching and learning and thereby enhance academic performance where there are no toilet facilities, no clean water supply; the environment may not be conducive and comfortable for learning. An environment where the students are uncomfortable may not allow free flow of learning and academic achievement may be hindered.

This study therefore sought to investigate the influence of school environmental factors on secondary school science students' academic performance in physics, in South West Local Government Area, Ibadan.

Research Questions

Based on the stated problems, the following research questions were answered.

1. What is the composite contribution of school environmental factors on students' academic performance in physics?
2. What is the relative contribution of school environmental factors on students' academic performance in Physics?

Methodology

The study adopted descriptive survey design. This design was employed because the information to be gathered already exists among the population under study.

Sampling procedure

The study covered 5 secondary schools in Ibadan south west local government area. This local government was chosen because not much research work on Physics has been done in Ibadan West. A simple random

sampling was adopted in selecting thirty (30) physics students in each of the selected schools. One hundred and fifty (150) students were sampled.

Instrumentation: Two research instruments were designed for the study. These are:-

(i) School Environmental Questionnaire (SEQ). It is structured to collect information on school environmental factors. This consists of 20 items, reflecting such items as temperature, library facilities, qualified and experienced teachers, laboratory facilities, school location, classroom, recreational facilities availability of water/toilet facilities, noisy environment and equipment. The reliability estimate using Cronbach Alpha was found to be 0.75.

(ii) Physics Achievement Test (PAT): This is a 20 multiple choice objective test adapted from Past WAEC questions. The test scores are meant to give the performance of students in Physics. Kuder Richardson formula 20 (KR20) was used to establish a reliable value of 0.85.

Results and Discussions

1. Research Question One: What is the composite contribution of School Environmental factors on students' academic performance? The 20 items on School Environmental factors were added together to give a singular score of the school environmental factors. The score was then regressed on 20 achievement test items .The result shows that the joint influence of the school environmental factors on students' academic performance in Physics is significant.

2. Table 1(a): Shows the joint effect of school environmental factors on students' academic performance

Model	Sum of square	DF	Mean square	F	Sig
Regression	218.136	10	21.814	19.783	.000
Residual	120.189	109	1.103		
Total	**338.325**	**119**			

R= .803, R^2= .645, Adj. R^2=.612

Table 1 (b): Regression Summary of School Environmental factors on Secondary school students Academic performance in Physics.

Multiple R	.803
R Square	.645
Adj. R. Square	.612
Standard error	

$F_{(10.109)} = 19.783$ * Significant $P<0.5$

The table shows that the combinations of all school environmental factors have a multiple correlation of .803 with the student's academic performance. However the combination of these factors (variables) explained 64.5% of the variance in students' academic performance as shown by the coefficient of determination ($R^2=.645$). The $F_{(10.109)} = 19.783$, $P<0.05$ shows that the value of multiple regression of 0.803 is not by chance. This implies that there is a strong relationship between School Environmental factors and students' academic performance.

Research Question Two

What is the relative contribution of School Environmental factors on students' academic performance in Physics? The result indicated that the school environmental factors such as temperature, library facilities, laboratory facilities, school location, and classroom, availability of water/ toilet facilities, noisy environment and equipment have positive contribution to the explanation of school environment. The rest of the measures of school environmental factors (Qualified and Experienced teachers and Recreational facilities) have negative contribution to the explanation of students' academic performance.

Table 2: Showing result of relative contribution of each factor on Academic Performance

Model	Unstandardized coefficients		Standard coefficient	T	Sig
	â	Standard Error	âETA		
(Constant)	2.221	.804		2.762	.007
Temperature	0.083E-02	.080	.065	.756	.451
Library facilities	.219	.101	.180	2.183	.031*
Qualified & Experienced Teachers	-6.10E-02	.109	-.043	-.557	.578
Laboratory facilities	.254	.073	.296	3.479	.001*
School location	.269	.095	.200	2.849	.005*
Classroom	.814	.125	.393	6.496	.000*
Recreational facilities	-7.81E-02	.184	-.038	-.424	.673
Availability of water/toilet facilities	6.441E-02	.157	.027	.409	.683
Noisy Environment	7.740E-0.2	.105	.049	.734	.464
Equipment	.208	.073	.217	2.843	.005*

*** = Significant (p<.05)**

The table shows the relative contribution of each environmental factor on academic performance of senior Secondary School Students in Physics. From the table above temperature is not significant [p<0.5]. âeta Value for temperature is 0.65 which implies that temperature accounts for 0.42% [$.065^2$ x 100] of the variation in students' academic performance in Physics.

- Library facilities is significant [p<.05]. âeta Is.180 which implies that Library facilities account for 3.24% [$.180^2$ x 100] of the variation in students' academic performance in Physics.
- Laboratory facilities is significant [p<.05]. . âeta Value â =.296 which implies that laboratory facilities accounts for 8.76% [$.296^2$ x 100] of the variations in students' academic performance in Physics.
- School location is significant [p<.05]. value for school location is .200 which implies that school location accounts for 4.00% [$.200^2$ x 100] of the variation in students' academic performance in Physics. This is in accordance with the findings of Osokoya and Akuche (2012) who found out that school location affected the students' cognitive

attainment and practical skills. They found no significant effect of school location on students' attitude to practical Physics.

- Classrooms is significant [P<.05] âeta value for classroom is .393, which implies that classroom accounts for 15.00% [$.393^2$ x 100] of the variation in students' academic performance in Physics.
- Equipment is significant [P<.05]. âeta Value for equipment is .217, which implies that equipment account for 4.71% [$.217^2$ x 100] of the variation in students' academic performance in physics.

From the table, some school factors are not significant. These factors include temperature, recreational facilities, availability of water/toilet facilities, noisy environment and qualified and experienced teachers.

Discussion

The results of this study revealed that temperature is not significant. However, it accounted for 0.42% of the variation in students' academic performance in physics. This is at variance with the findings of Chan (1998) which states that poor maintenance and ineffective ventilation system lead to poor health among students as well as teachers which eventually leads to poor performance and higher absentee rates.

The finding also revealed significant influence of library and laboratory facilities. Library facilities accounted for 3.24% of the variation in students' academic performance in Physics; Laboratory facilities accounted for 8.76%. Corroborating these, Mark (2002) and Ajayi (2007) maintained that high levels of students' academic performance may not be guaranteed where instructional space such as classrooms, libraries, technical workshops and laboratories are structurally defective. However, this is at variance with the findings of Gamora (2002) who found that books in the library and presence of science laboratory had little impact on variation in students' performance once student background variable had been taken into account.

The finding further revealed significant influence of classroom and equipment. Classroom accounted for 15% of the variation in the students' academic performance in physics while equipment accounted for 4.71%. This is in accordance with the findings of Fabumi (2007) which

asserted that school facilities when provided will aid teaching-learning programme and consequently improve academic performance of students. Also Marsden (2005), agreeing with the findings, reported that safe and orderly classroom environment, school facilities were significantly related to students' academic performance in elementary school.

Glassman (1994) asserted that a comfortable and caring environment among other treatments helped to contribute to students' academic performance. Furthermore, school location was found to be significant and it accounted for 4.00% of the variation in students' academic performance in Physics. This agrees with the finding of Osokoya and Akuche, which showed that school location significantly affected cognitive attainment and practical skill of students in practical Physics.

It is recommended that library facilities, laboratory facilities are made available and maintained in secondary schools. Schools should be cited in less noisy areas. Toilet facilities and water supply should be provided and maintained by Federal and State Government and Stake holders should make sure that schools are well equipped with necessary facilities. Principles/Head teacher should ensure that the facilities are available and well maintained.

Conclusion

The findings suggest that library, laboratory facilities classroom and equipment have significant influence on students performance in physics. High level of students' performance could be achieved when the library as well as the laboratory is not structurally defective.

The government and all educational stakeholders should ensure that schools are well equipped with facilities needed for effective teaching and learning, and all round development of the students. Not only should these facilities be present, but they must be up to date and well maintained.

Referencs

Ajayi, A.A. (2007), Environmental Effects on Students' Performance Published by Nosec 2.

Ajayi, O.B. and Oluchukwu C.A., (2001). Factors Affecting Academic Achievement. University Press.

Babajide, V.F.T., (2010) Generative and Predict Observe Explain Instructional Strategies as Determinants of Secondary School Students Achievement and Practical Skills in Physics. An unpublished Ph.D Thesis University of Ibadan, Ibadan

Chan, E.O. (1996). Poor Learning Facility. God We Trust Printing Press.

Fabunmi, G.R. (2007). Impact of Parental Socio-Economic Status on Students' Educational Achievement at Secondary Schools of District Malir, Karachi Middle East: Journal of Scientific Research 6.

Ferguson, R.J., (2001) The Impact of School Resources on the Learning of Inner-city Children. Cambridge.

Glassman, D.F., (1994). Comfortable and Caring Environment for Learning. Landmark Enterprise.

Gamora, O. (2002) Influence of Family Background on Academic Achievement of Secondary Schools Biology Students in Anambra state: An International Multidisciplinary Journal, Ethiopia

Iroegbu, T O., (1998) Problem Based Learning, Numerical Ability and Gender as Determinants of Achievement in Line Graphing Skills in Senior Secondary Physics. An unpublished Ph.D Thesis University of Ibadan, Nigeria.

Lyons, G.L. (2002). Impact of Learning on the Student. Lantern Nigeria Plc.

Madumere, N.F. (1982), Factors to be Considered in Location of a School. Great Printing Press.

Mark, D.H. (2002), Impact of well Equipped and Ventilated Environment on Academic Performance of Students in Secondary Schools. Lantern Printing Nigeria.

Marsden, W.R., (2005) Classroom Environment Buzak Publishing Company.

Okoronka, A. U. (2004) Model Based Instructional Strategies as Determinants of Student's Learning Outcomes in Secondary Physics in Lagos State. An Unpublished Ph.D Thesis University of Ibadan, Nigeria.

Oluchukwu, C.O. (2000), Impact of Well Ventilated Environment on Students' Performance. Man Printing Press, Nigeria.

Osokoya, Modupe M. and Akuche, Ukamaka E. (2012). Effects of School Location on Students' Learning Outcomes in Practical Physics. An International Journal of Psychology in Africa. Ife Centre for Psychological Studies. Vol. 20, No. 1.