Influence of school environment on academic achievement of secondary school students in Ibadan Metropolis

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Abstract
This research explored how school environmental factors influence students' academic achievement. The main objective of the study is to analyse how school facilities, teachers and school environment affect students' academic achievement in Ibadan metropolis. The study adopted a descriptive survey design and conducted the study among SS2 students from Ibadan educational zone 1. The population for the study consists 400 students from 22 selected public secondary schools in Ibadan metropolis. A school environment questionnaire and a mathematics achievement test were the two instruments used for data collection study. The reliability coefficient for the questionnaire was 0.90 and a pilot test-retest reliability Cronbach's alpha (0.75 & 0.91). 4 research questions were raised and answers were provided. Findings showed that students in well- equipped schools under favourable environment performed better than those from schools with inadequate educational facilities. The study recommends that government agencies in charge of educational foundation and administrators should pay close attention to the provision of modern educational facilities for the schools to promote academic performance in Nigeria.

Keywords: *Academic, Achievement, Mathematics, School Environment, Academic Performance*

Introduction

The school is a community-based center where important cultural activities related to the education of young people are carried out. Schooling can be carried out in permanent or temporary buildings, in tents and sometimes under the trees but when children come together to learn, they share learning experience, develop potentials and ultimately enrich their lives. Through schooling, learners are exposed to the surrounding world and they can be equipped with the tools they would need for future success in the job market. Studies conducted by Adegoke and Nweneka (2016) and Olabisi (2019) have shown that schooling is not always a smooth sailing experience for learners. Consequently, there are constraints, hindrances, inhibitions or threats that could influence a child's chances of enrolling in school and performing brilliantly in his or her studies. These threats can be associated with the school, the home or community or simply by nature. Invariably, the most potent factor that could also influence a child's enrolment and performance in school can be considered environmental.

According to the findings of Fajar, Hussain, Sarwar, Afzal and Gilani (2019) factors that determine their academic performance of students in mathematics cannot be understood without identifying environmental antecedents such as learning facilities, teachers' competence, conducive classroom, etc. They also discover that teacher, school, home and student-related factors also affect students' academic performance. In the same vein, Igbinoba and Aigbedion (2015) related students' academic performance in selected junior secondary schools with school environment in Abuja Municipal Area Council.

In fact, learning environment meant the real physical elements within the students' reach including school facilities and learning facilitators. Meanwhile, academic achievement is the learner's capacity or potentials to perform academic tasks of reading and recalling or memorize specific information that are orally or in writing even under examination conditions. In the school system, academic achievement of students are measured by their scores in test and examinations on the subjects they have been taught. In secondary schools in Nigeria, school subjects include English language, mathematics, science-based subjects like Biology, chemistry and physics, social-sciences

like geography and economics, and liberal arts like history and literature in English. Among these, as stated in the Nigerian Education policy as reviewed in 2014, mathematics is a core subject in secondary schools which students must offer. Mathematics is also a prerequisite to the study of science in colleges, polytechnics and universities. This is because mathematics is the basis of physical science, social science and technology.

Statement of the Problem

Statistics, as released by the West African Examination Council, shows that Senior Secondary School (SSS) students' performance in mathematics in public examinations in Nigeria is still just slightly above average (Umar & Samuel, 2019). In Nigeria, students had to endure difficult conditions like extreme cold or unbearably hot temperatures in the classrooms. In some cases, lack of competent teachers, relevant texts and curricular are major issues students confront in schools. Students are sometimes made to contend with violence from fellow students and even their teachers. These conditions are not conducive to learning and the resultant effect is high rate of dropouts in our schools. However, Nigeria is known for having a hike in the rate of school dropouts compared with other countries globally (Okoye, et al, 2019). Declining academic performance among students has remained a recurring irritant in Nigeria's educational system in spite of all efforts of government and major stakeholders to change the narrative in the education sector. Since all teaching and learning activities take place within an environment, it is expected that the outcome of the education process correlates significantly with the teaching-learning environment (Umar & Samuel, 2019).

Objective of the Study

i To find out the Influence of school environment on academic achievement of students in Mathematics, and

ii. To analyse influence of student factors on perception of school environment.

iii. To determine relationships between school environment, gender, age and academic achievement in mathematics among students

Research Questions

i. Is there any difference in the school environment perception of students based on (a) their gender (b) age

ii. What is the composite and relative contribution of school environment, gender and age to the level of academic achievement in mathematics among students?

iii. Will there be significant relationships between school environment, gender, age and academic achievement in mathematics among students?

Literature Review

Owoeye (2011), in his research on geological areas of schools, showed that there is a huge influence on the academic achievement of students in provincial and metropolitan optional school as portrayed by senior school examinations. He likewise brought up argument that the lopsided disseminations of assets, poor school planning, resources, capability of teachers and some instructor's refusal to move to segregated towns, are a portion of the components adding to the wide gap among urban and rural school performances among students in a differential analysis. In metropolitan areas, students enjoy the benefit of positive learning climate that subsequently upgrade their academic achievement.

According to Teacharnet (2008), the environment in which students study can have a profound influence on their academic performance and learning. School buildings, structures and facilities play an important role in creating a conducive learning environment and promoting effective teaching and learning. Adewuyi (2002) argue that a suitable learning environment can have an impact on all activities and student performance. Asiabaka (2008) and Nwagwua (2006) emphasize that the quality of education received by students directly relates to the availability of resources and the general atmosphere in the learning environment. At the early days of education, the primary goal was to educate the child, no matter the environment (Wagner, 2017). This goal derives from the philosophy that something was better than nothing which implies that any learning

environment was better than no learning environment. As learning cannot take place in vacuum, any available environment was acceptable.

However, with the growth in literacy rates across the globe over the years, there has been a paradigm shift by educational administrators to improvement in the quality of education, with great attention attached to the environment of education. The environment is critical to the development of individuals in the society. In the school system, for instance, environment determines whether a child will be happy and ready to learn or become a deviant. The physical, social and psychological or emotional environments must be such that every aspect of human behaviour is warmly accommodated. Education is an important industry for social, political and economic development and it is affected by the environment within which it is conducted (Adediran, Ojomo & Adeyanju, 2015). The physical environment can determine the comfort of students and thereby their learning ability (Falsario, Muyong and Neuvaespana, 2014). When students are uncomfortable, they are easily distracted and are not likely to learn faster than their peers whose environments are quite comfortable.

Wagner (2017) posits that students' behaviour towards academic performance can be influenced through provision of an environment that balances and controls stimulants to the five human sensory organs: sight (what learners see), hearing (do they hear their teacher or noise from outside?), touch (is the temperature too hot or too cold?), smell (does the scent from deodorant or cleaning liquid support or disrupt learning?), and taste (there should be provision for food and drinks because hunger can disrupt learning). Wagner further alludes to substantial evidence that educational objectives like reading comprehension, multiplication and reading speed can be influenced by the study environment.

According to Olufemi, Adediran and Oyediran, (2018), students' academic performance is affected by several factors which include students' learning skills, school environment, parental background, peer influence, teachers' quality, learning resources and infrastructure, among others. The school environment, for instance, supports the acquisition of academic knowledge. Therefore, understanding the role of school environment in students' mathematics' achievement cannot be over-emphasized.

Methodology

The study adopted a descriptive survey design and conducted the study among SS2 students from Ibadan educational zone 1, the sample consists of intact classes of SS2 students from twenty randomly selected from five local government areas of Ibadan educational zone 1. The instrument for data collection was a structured questionnaire consisting of questions concerned with the school environment and a Mathematics Achievement Test (MAT). Data collected were analyzed using SPSS version 20.0 to statistically address the four (4) main research questions of the study. Research question 1 was tested using Correlation test, research question 2 was answered using independent t-test and One-Way Anova, research questions 3 & 4 were answered with multiple regression analysis.

Data Analysis Results

Research question 1: Will there be significant relationship between school environment, gender, age and academic achievement in mathematics among students?

Table 1: Intercorrelation Matrix of School Environment, Gender, Age and Academic Achievement

		Gender	Age	School Environment	Academic Achievement
Gender	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	400			
Age	Pearson Correlation	.169*	1		
	Sig. (2-tailed)	.001			
	N	400	400		
School Environment	Pearson Correlation	-.036	.156*	1	
	Sig. (2-tailed)	.474	.002		
	N	400	400	400	
Academic Achievement	Pearson Correlation	-.045	.154*	.974*	1
	Sig. (2-tailed)	.365	.002	.000	
	N	400	400	400	400

* Correlation is significant at p<.05

Table 1 shows that statistically significant and strong positive correlation exists between school environment and student's achievement ($r = 0.97$; $p < 0.05$). This implies that to a great extent, the school in which students found themselves contribute to their academic performance in Mathematics. Also, the positive relationship implies that students will perform well if the environment is friendly and attractive. More conducive school environment with favourable conditions is directly related to higher academic achievement of the students. The result reveals positive but low relationship between student's age and their academic achievement {$r=0.15;p<0.05$}, which means that older students tend to have better academic achievement in such environment.

However, the relationship between student gender and academic achievement is negative ($r = -0.05$; $p > 0.05$). This implies that whether a student is a male or female has no influence on the academic performance in Mathematics.

Research Question 2: Is there any difference in the school environment perception of students based on (a) their gender (b) age

Table 2: Independent t-test of Gender on Academic Achievement

Gender	N	Mean	SD	Std. Error	T	Sig. (2-tailed)
Male	205	51.92	13.786	.963	.907	.365
Female	195	50.71	12.838	.919		

Results in Table 2 show that although male students performed better ($X = 51.92$; $SD = 13.79$) than their female colleagues ($X = 50.71$; $SD = 12.84$), the observed difference of 1.21 in their academic achievement scores is not statistically significant, $t(398) = 0.91$, $p > 0.05$. These results connote that student gender does not have a significant influence on academic achievement.

Table 3: Analysis of Variance (Age on Academic Achievement)

	SS	DF	MS	F	Sig
Between groups	3064	5	612.991	3.561	.004
Within groups	67825	394	172.145		
Total	70890	399			

Table 4: Summary of Post hoc Analysis (Scheffe)

Age					95% confidence Interval	
(I)	(J)	Mean Difference	Std.Error	Sig.	Lower Bound	Upper Bound
14	13	-3.657	4.568	.986	-18.93	11.62
	15	-4.795	1.708	.166	-10.51	.92
	16	-5.971*	1.772	**.047***	-11.90	-.05
	17	-9.053	3.152	.146	-19.60	1.49
	18	9.732	9.371	.956	-21.61	41.07
16	13	2.314	4.531	.998	-12.84	17.47
	14	5.971*	1.772	**.047***	.05	11.90
	15	1.176	1.606	.991	-4.19	6.55
	17	-3.082	3.098	.963	-13.44	7.28
	18	15.703	9.353	.728	-15.58	46.98

In Tables 3 and 4, the results of a one-way ANOVA reveal that age has a significant effect on academic achievement, F (5, 399) = 3.56, P<0.05. Furthermore, analysis of post-hoc analysis (Scheffe) indicates that the mean difference is in favour of students who are 17 years of age.

Table 5: Analysis of Variance (school environment on academic achievement)

	SS	Df	MS	F	P
Between Groups	54716.105	2	27358.052	671.519	.000
Within Groups	16173.993	397	40.741		
Total	70890.097	399			

School environment (I)	(J)	Mean Difference (I-J)	Std. Error	P	95% Confidence Interval	
					Lower Bound	Upper Bound
Low	Moderate	-12.268*	.762	.000	-14.14	-10.40
	High	-29.048*	.793	.000	-31.00	-27.10
Moderate	Low	12.268*	.762	.000	10.40	14.14
	High	-16.780*	.797	.000	-18.74	-14.82
High	Low	29.048*	.793	.000	27.10	31.00
	Moderate	16.780*	.797	.000	14.82	18.74

* Significant at the 0.05 level.

In Tables 5 and 6, effect of school environment on students' academic achievement was tested using a One-Way ANOVA. Results indicate that learning environment (school) had significant effect on students' academic achievement, F (2, 399) = 671.52, $p < 0.05$.School environment was categorized into three statistically equal groups of low, moderate and high. A post-hoc analysis (using Scheffe) further reveals that the difference is in favour of school environment in the high category/group.

Research Question 3: What is the composite contribution of school environment, gender and age to students' academic achievement in mathematics?

Table 7: Model Summary

Model	R	R^2	Adj. R^2	Std. Error
	.974	.948	.948	3.039

Predictors: (Constant), gender, age, school environment

Table 8: Regression ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	67232.219	3	22410.740	2426.175	.000
Residual	3657.878	396	9.237		
Total	70890.097	399			

Dependent Variable: academic achievement

As presented in Table 7 and 8, regression analysis showed the relative and composite contributions of the predictors (gender, age and school environment) on the criterion variable (academic achievement). The results in Table 7 and 8 show that the variables have linear relationship; the predictors account for 94.8% variance in academic achievement [R = 0.97; R^2= 0.95; Adj.R^2= 0.95]; and they significantly predict the model, F (3, 399) = 2426.18, p < 0.05.

Research Question 4: What is the relative contribution of school environment, gender and age to students' academic achievement in mathematics?

Table 9: Regression Coefficients

Model	Unstandardized Coefficientss		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	-131.299	3.034		-43.273	.000
School environment	1.392	.017	.973	84.004	.000
Age	.055	.166	.004	.333	.739
Gender	-.298	.309	-.011	-.963	.336

A further analysis in Table 10 reveals that only one of the three predictors – school environment [β=0.97, t(399) = 84.0, p < 0.05] – allows for a reliable prediction of student's academic achievement in this model.

Discussion of Findings

Research has shown that there is a strong connection between the school environment and students educational achievement (r-0.97; p<0.05). This implies that schools with conducive environment enhance learning. In other words, the importance of school environment with modern facilities, good student-student relationship and teacher-student relationship would facilitate students' achievement. This finding is in accordance with the discoveries of Obemeata (2006) who established that students in metropolitan schools performed very well in their academics than their mates in provincial schools as a result of the available learning infrastructures in metropolitan region. This finding is additionally reliable with the reports of Akubue and Ifelunni (2006) who argued that helpless climate and poor infrastructural facilities in rural schools hugely add to helpless educating, poor studying and low level of academic achievement. Likewise Arul (2012) has exhibited in his investigations that the school environment and climate profoundly affects students' achievement. Another study conducted by Mudassir et. al. (2015), found out that schools that are enriched with good teachers, advantageous learning environment, positive teacher-student relationships usually end up having excellent academic achievement. Thus, the place of conducive school environment cannot be underrated in the academic performance of students.

Conclusion

As observed in the study, there is a strong positive connection between the school environment and student's educational achievement while this implies that students in conducive learning environment whereby necessary educational materials are available including strong rapport between teachers and students performed better than their counterparts in schools who were studying under less supportive learning environment.

From the foregoing, it is concluded that school with educational supportive learning environment contributed significantly to the students' academic achievement and performance.

Recommendations

1. School authorities should ensure the school fencing is constructed across locations. These suggestions will help improve on the school environmental conditions, and thereby motivating students also to adjust to learning environment and perform up to expectations.
2. Adequate teaching materials should be provided to schools to assist teachers in instructional delivery.
3. Adequate classroom buildings should be provided in public schools for effective teaching and improved academic achievement.
4. Educational administrators should ensure positive learning environment that will enhance teaching and learning.

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