INFLUENCE OF CLASSROOM ENVIRONMENT ON ACADEMIC ACHIEVEMENT IN MATHEMATICS AS PERCEIVED BY JUNIOR SECONDARY SCHOOL STUDENTS IN OYO STATE

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Abstract
This study investigated the influence of classroom environment on academic achievement in mathematics as perceived by Junior secondary school students in Akinyele Local government Area of Oyo State. Two research questions and two hypotheses guided the study. Descriptive research design of survey type was used for the study. Simple random sampling technique was adopted for the selection of five secondary schools in Akinyele Local Government and the same sampling procedure by balloting was used to select Thirty-two (32) students in Junior Secondary School three (JSS3) class in each school. A total of 160 students participated in the study. Two instruments were developed by the researcher and validated by the expert namely: Students Perception of Classroom Environment (SPCE) and Mathematics Achievement Test (MAT) with the reliability coefficient values of 0.76 and 0.72 respectively. Data obtained were analyzed using descriptive statistics such as frequency count, mean and standard deviation and inferential statistics such as independent t-test and Multiple Regression. The findings of the study revealed that most of the respondents agreed that their classrooms have enough ventilation, enough brightness and charts were available in their classrooms to enhance mathematics learning. However, some of the respondents disagreed that there are enough seat in their classes and good sitting arrangement. Also, from the Levene's test for equality of variance the result revealed that equal variances assumed with (t-value=0.125, df=158,p> 0.05) the result shows there is no significant difference in the classroom environment perception of Junior Secondary School Student based on their gender. This implies that whether a student is a male or a female has no influence on how such perceive the classroom environment. The results also show that there exists a linear relationship between the predictors and the criterion variable. One of the recommendations is that government and other education stakeholders should make concerted efforts to provide more educational facilities for schools so as to enhance students' academic achievement in mathematics.

Keywords: Students, Mathematics, School Environment, Academic achievement

Introduction

The irreplaceable contribution of education to the development of nations cannot be overemphasized. Education sector is saddled with the task of achieving national development goals and for the educational goals to be achieved, teachers are expected to be committed and play a significant role in addressing students' performance gaps. The wealth of any country is not only determined by the natural resources available and physical capital but also the human resources which is being developed through education that is geared towards the needs of the individual and the society. Human resources could be said to be an active agent of production which accumulates capital, explore other relevant resources, build and develop social and economic institutions (Osalusi & Onipede, 2017). The realization of the importance of mathematics to man and the society probably account for its' inclusion in the school curriculum

as a compulsory subjects so as to enable individual to face challenges of life and to enhance national development.

Mathematics is a prerequisite subject for many fields of learning that contributes immensely to the technological growth of the nation (Ahmed, 2008). This includes medicines, pharmacy, nursing, agriculture, forestry, biotechnology, nanotechnology, and many other areas (Ahmed & Abimbola, 2011). Also, Umameh, (2011) in Tshabalala and Ncube, (2013) was of the view that mathematics is bedrock and an indispensable tool for scientific, technological and economic advancement of any nation. Despite the fact that mathematics is one of the major and hinge of science subject in Nigeria schools, it is quite unfortunate that the subject is being dreaded by many students today and so many factors are responsible for students' poor academic performance in mathematics such as: negative attitudes of students towards mathematics, poor instructional strategies, abstract nature of the subject, difficulty paying attention, lack of practice and poor learning environment schools among others (Oni & Isola, 2019).

Learning environment refers to all the human and materials resources available in the school which a child can see, hear, touch, smell, taste, feel and respond to. Examples are teachers, school children, school buildings classrooms school compound, sporting equipment, learning materials among others. The appropriateness of a learning environment is a key both to safety and to effective learning and development (Liu & Zumbo, 2016). The environment in which students learn can significantly influence the academic performance and well-being of the learners. The architecture, layout, and facilities of the school play a vital role in shaping the learning environment and promotion of effective teaching and learning. Again, Michael (2017) argued that the learning environment can serve as a tool for influencing behaviour and as an aid to the teacher in the management tasks. Cotton, (2016) has identified components of learning environment as appearance and physical plants; faculty relations; leadership and decision making; environment that is welcoming and conducive for learning; environment that promotes communication and interactions; environment that promotes a sense of belonging and self-esteem and the environment that promotes learning and self-fulfillment. Friendly school environment provides necessary stimulus for learning experience since students spend their most of their time in the school (Oni, 2019). Apart from learning environment, availability of learning resources in teaching mathematics goes a long way in enhancing students' performance in mathematics. Such learning resources are: text books, writing materials, charts, construction/ drawing instruments, graph board, mathematical set among others. All these learning resources do contribute remarkably to students' performance in mathematics. Shamaki (2015) asserted that learning environment could be an essential key determinant to the students' achievement in mathematics.

The major purpose of teaching and learning process is to bring about in the learner desirable change in behaviour through critical thinking. This process however, does not take place in vacuum but in an environment structured to facilitate learning. OECD (Organization for Economic Co-operation and Development) (2009) described learning environment as a physical space that supports multiple and diverse teaching learning programmes including current technologies, one that demonstrates optimal, promotes effective performance and operation over time; one that respects and is in harmony with the environment; and one that encourages social participation, provide a healthy, comfortable, safe, secure and stimulating setting for its occupants. Learning environment has also been emphasized as an essential requirement for smooth teaching and learning process to take place (National Teachers Institute, NTI 2008).

This is because students study habits are to a large extent tied to it. A good learning environment presents learning as a lifelong enterprise and enables students to discover appropriate value system that can be their compass for self-awareness and national consciousness.

The facilities that are needed to facilitate effective teaching and learning in an educational institution include the classrooms, offices, laboratories, conveniences and other buildings as well as furniture items and sporting equipment. Comfortable classroom temperature and smaller classes enhance teachers effectiveness and provide opportunities for students to receive more individual attention, ask more questions, participate more fully in discussions, reduce discipline problems and perform better than students in schools with substandard buildings by several percentage points (Earthen, 2012). Learning environment promotes students learning and positive learning environment greatly influence students motivation to learn. Positive learning environment promotes cooperative learning, group cohesion, respect and mutual trust, (Bandura, 2011). Rutter, Dukor and Fair (2009); Scheerens and Creemers (2009); Adewuyi (2012) submitted in their various studies that conducive learning environment can have positive effect on both attitudes and achievement of students. Researchers such as Egim (2013) and Obong (2017) revealed that quality of learning facilities available within the learning environment has positive relationship with the quality of teaching and learning activities which in turn influence students' academic performance.

Statement of the problem

Students' academic achievement in mathematics in the Junior school has become worrisome for education stakeholders in the recent time. Intelligent is not the only determinant of academic achievement of students. Basic Educational Certificate Examination (BECE) Chief Examiner's report (2011-2016) stated that the persistent poor achievement of students in Mathematics at Junior Schools Certificate Examination leaves one in doubt about the effectiveness of Instructional materials, learning environment and instructional delivery approaches popularly used by the Mathematics teacher (Oni & Isola, 2019). Glassman (2014) asserted that a comfortable and caring learning environment enhance students' academic performance. In order to find out this, it has become necessary to investigate the influence of school environment on academic achievement in mathematics as perceived by Junior secondary school students' in Akinyele Local Government, Oyo State.

Purpose of the study

The purpose of this study was to investigate the influence of school environment on academic achievement in mathematics as perceived by Junior secondary school students' in particular to identify factors within the learning environment that affect students' academic achievement in mathematics in Junior secondary school in Akinyele Local Government, Oyo State.

Research Questions

The following research questions guided the study

(i) What is the perception of Junior Secondary school students on the influence of classroom environment on their academic achievement in mathematics?

(ii) Does gender influence the perception of Junior secondary school students on the influence of classroom environment on academic achievement in mathematics?

Hypotheses

Ho_1: There is no significant difference in the classroom environment perception of Junior Secondary School Student based on their gender?

Ho_2: There is no significant effect perception of classroom environment of junior secondary school students on their achievement in mathematics.

Methodology

Descriptive research design of survey type was adopted for the study. The target population of the study comprised all students from five selected secondary schools in Akinyele Local Government Area of Oyo State. Simple random sampling technique was adopted for the selection of five secondary schools out of Twenty (20) secondary schools from Akinyele Local Government Ibadan, Oyo state. They are: Akingbile Oluana Community Grammar School, Aponmode Grammar School, Aponmode, Moniya Grammar School, C.H.S Alabata and Ajibade Community High School .The same sampling procedure by balloting was used to select Thirty-two (32) students in Junior Secondary School three (JSS3) class in each school. A total sample size of 160 participated in the study. Two instruments were developed by the researcher namely: Students' Perception of Classroom Environment (SPCE) and Mathematics Achievement Test (MAT). Students' Perception of Classroom Environment (SPCE) has two sections .Section A sought for bio data information of the students such as: name of the school, age, gender etc. while section B contains twelve (12) items which solicited for information on classroom environment as perceived by student with four (4) likerts scale of Agree (A), Strongly Agree (SA), Disagree (SD). Mathematics Achievements Test (MAT) contains two sections. Section A solicited for bio-data of students such as; name of the school, class, gender, Age etc. Section B dealt with twenty five (25) objective questions which was prepared using table of specification according to Bloom Taxonomy. The objective questions covered Five (5) Junior secondary school (JSS3) topics which the students has been taught and which has four options of which students are to pick one correct answer. To ensure face and content validity of the two instruments, the draft copy of the instruments were given to experts in mathematics education and expert in Educational Evaluation. The appropriateness of the items, clarity of language and relevance was checked. Thereafter, the reliability coefficients of the instruments were calculated using Cronbach Alpha procedure and the values obtained were 0.76 and 0.72 respectively. Data obtained were analyzed using descriptive statistics such as frequency count, mean and standard deviation and inferential statistics such as t-test and Multiple Regression.

Results

Table 1: Gender Distribution of Students

Gender	Frequency	%
Male	67	41.9
Female	93	58.1
Total	**160**	**100.0**

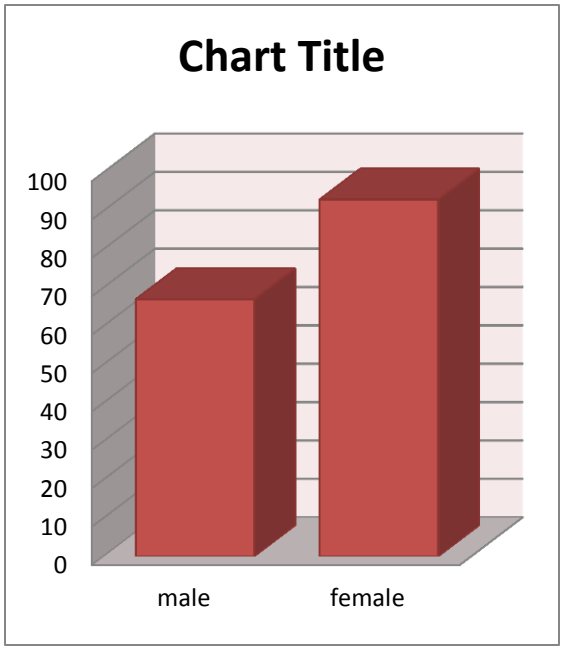

Figure 1: Gender Distributions of Students

Research Question 1: What is the perception of Junior Secondary school students on the influence of classroom environment on their academic achievement in mathematics?

Table 2: Descriptive analysis on classroom environment perception

S/N	Statement	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean	Std. Dev	Remarks
1.	There is enough ventilation in the mathematics class	112(70.0)	30(18.8)	18(11.3)	-	3.59	.686	Agreed
2.	The classroom has enough seats and desk for every student	2(1.3)	28(17.5)	125(78.1)	5 (3.1)	2.17	.479	Disagreed
3.	Good sitting arrangement makes mathematics learning interesting	17(10.6)	52(32.5)	91(56.9)	-	2.54	.681	Disagreed
4.	The classrooms have enough space for each and every student	15(9.4)	40(25.0)	102(63.8)	3(1.9)	2.42	.687	Disagreed
5.	No student obstructs another's view due to seats arrangement	32(20.0)	105(65.6)	22(13.8)	1(0.6)	3.05	.602	Agreed
6.	Teacher always come to class with materials that aid mathematics learning	53(33.1)	92(57.5)	11(6.9)	4(2.5)	3.21	.677	Agreed
7.	One can clearly see all writing on the board from the back seat	30(18.8)	107(66.9)	16(10.0)	7(4.4)	3.00	.682	Agreed
8.	The number of students in the class is not too much	17(10.6)	89(55.6)	33(20.6)	21(13.1)	2.64	.843	Agreed
9.	There is enough brightness in the class	38(23.8)	23(14.4)	22(13.8)	77(48.1)	2.14	1.251	Agreed
10.	Mathematics class is free of reptiles	106(66.3)	46 (28.8)	8(5.0)	-	3.61	.583	Agreed
11.	The class is not noisy	84(52.5)	35(21.9)	35(21.9)	6(3.8)	3.23	.920	Agreed
12.	Charts hang on the wall enhance mathematics learning	98(61.3)	31(19.4)	21(13.1)	10(6.3)	3.36	.934	Agreed

Source: Field Survey (2019)

Table 2 is the presentation of the responses of the students on their classroom environment perception. The table revealed that most of the respondents agreed that their classrooms have enough ventilation, enough brightness and charts were available in their classrooms to enhance their mathematics learning. They also agreed that teachers come to class with enough teaching materials. However, the respondents disagreed that there are enough seat in their classes, good sitting arrangement

Research Question 2: Does gender influence the perception of Junior secondary school students on the influence of classroom environment on academic achievement in mathematics?

Table 3a: Descriptive statistic on classroom environment perception of Junior Secondary School Student based on their gender

	Gender	N	Mean	Std. Deviation
classroom environment	Male	67	34.9851	2.94645
	Female	93	34.9247	3.07245

Ho_1: There is no significant difference in the classroom environment perception of Junior Secondary School Student based on their gender?

Table 3b: Independent sample t-test analysis on classroom environment perception of Junior Secondary School Student based on their gender

Levene's Test for Equality of Variances				t-test for Equality of Means		
		F	Sig.	t	df	Sig.(2-tailed)
Academic achievement score	Equal variances assumed	.528	.468	.125	158	.901
	Equal variances not assumed			.126	145.744	.900

From Table 3a and b revealed that 67 of the respondent are male while 93 of the respondent are female. From the Levene's test for equality of variance the result revealed that equal variances assumed with (t-value=0.125, df=158,p> 0.05) the result shows there is no significant difference in the classroom environment perception of Junior Secondary School Student based on their gender. This implies that whether a student is a male or a female has no influence on how such perceive the classroom environment. Therefore, the stated null hypothesis that there is no significant difference in the classroom environment perception of Junior Secondary School Student based on their gender is not rejected.

Ho_2: There is no significant impact of the perception of classroom environment of junior secondary school students on their achievement in mathematics.

Table 4: Multiple Regression table showing impact of the perception of classroom environment of junior secondary school students on their achievement in mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6.744	1	6.744	.375	.541[b]
	Residual	2842.356	158	17.990		
	Total	2849.100	159			

Model Summary
R= .049[a]
R^2= .002
Adjusted R^2= -.004
Std. Error of the Estimate= 4.241
a. Dependent Variable: Achievement in Mathematics
b. Predictors: (Constant), Perception of classroom environment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.815	3.919		4.036	.000
	classroom environment	-.068	.112	-.049	-.612	.541

a. Dependent Variable: Achievement in Mathematics

Table 4 is the presentation of regression analysis of the effect perception of classroom environment of junior secondary school students on their achievement in mathematics. The result presents the value of multiple correlations (R = .049), square of multiple correlations (R^2= 0.002) and Adjusted R^2 (-0.004) in the model summary table alongside with the ANOVA table. The results show that there exists a linear relationship between the predictors and the criterion variable. The result from the table revealed multiple correlations of 0.049 between classroom environment perception and achievement in mathematics. However, R^2 of 0.002 implies that although there is relationship there exists almost no effect classroom environment perception on achievement in mathematics since the result is statistically not significant. The independent variables accounted for only 0.4% of the total variance observed in dependent variable (perception of classroom environment) leaving the remaining 99.6% to other factors that were not considered in this study. Therefore, the null hypothesis that there is no significant effect perception of classroom environment of junior secondary school students on their achievement in mathematics is not rejected. The result implies that no matter a student perception of the classroom environment has no effect on the achievement in mathematics.

Discussion

The essence of teaching is to create positive changes in the behavior of the learners and improve their academic performance gaps. There is no doubt that good academic performance is linked to the positive learning environment. From the findings of the study, most of the participants disagreed with the statements that classroom has enough space for each and every

student, classroom has enough seats and desk for every students and good sitting arrangement makes mathematics learning interesting. Meanwhile, all these are very necessary for better performance of students in mathematics. Classroom environment entails good teaching, classroom management, classroom climate (noisy or quiet) and the physical condition of the classroom (dark or illumination). Physical organizations of the class also do enhance students' performance in mathematics such as ensuring good seating arrangement and placement of the chalkboard at the centre of the classroom. A child that is partially sighted should be made to sit in front of the class in order to help him or her sees and copy easily on the chalkboard. The classroom should be well illuminated with enough light and there should free flow air through adequate ventilation. This is in line with the study of Isaac, Haastrup and Osalusi (2011) who found out that positive learning environment can significantly improve the academic performance of students in secondary schools. Also, the finding of the study supported the assertion of Kochhar (2012) who asserted that availability of educational resources is very important learning and teaching tools. Favorable school environment provides necessary stimulus for learning experience since students spend their most of their time in the school. Shamaki (2015) asserted that learning environment could be an essential key determinant to the students' achievement in mathematics. Mudassir et al (2015) opined that school environment has a significant influence on academic performance of students. Likewise, from the study, the result shows that there is no significant difference in the influence of classroom environment based on gender. Also, from the result of the study, no matter a student perception of the classroom environment has no effect on the achievement in mathematics because there are other factors that were not considered in the study that contributes to student poor performance in mathematics.

Conclusion

Learning environment is very crucial to student academic achievement in mathematics. There is no doubt that learning components such as furniture, ventilation, illuminated classroom, classroom arrangement and classroom climate (noisy or quiet) will contribute positively to the academic achievement of student in mathematics.

The results show that there exists a linear relationship between the predictors and the criterion variable. This is an indication that educational facilities in secondary schools should be a prime concern of the education stakeholders in the state and the nation in general. It is believed that conducive classroom environment with available school facilities will enhance academic performance of students in mathematics.

Recommendations

Based on the conclusion drawn, the following recommendations were made:

(i) Government and other education stakeholders should make concerted efforts to provide adequate classroom building, provide enough chairs and tables and renovate the existing dilapidated structures in public secondary schools. This would help to reduce the problem of school overcrowding and it would go a long way to create enabling teaching and learning environment of mathematics.

(ii) Since school environment comprises of human and materials resources, teacher should to make atmosphere of the classroom environment friendly enough for students to learn.

(iii) Again teacher should endeavor to position the chalkboard in appropriate place where even partial sighted can conveniently see the board. A well-arranged classroom should be paramount to every teacher.

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