

2024, Vol. 02, Issue 03, 40-54 DOI: https://doi.org/10.59231/edumania/9054 Influence of School-climate on Science Students' Performance in Ibadan, Oyo

State, Nigeria

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Abstract

This study investigated the Influence of School-climate on Science Students' Performance in Ibadan, Oyo State, Nigeria. A descriptive survey design was adopted for the study with a focus on Senior Secondary School II Science Students, which necessitated the use of questionnaires for data collection. The instrument was validated and tested for reliability using Cronbach Alpha statistic with 0.82 reliability value. Result formats were also used for collecting the average scores of 250 participating science students in science subjects (Biology, Chemistry, Physics, and Further Mathematics) from the school authorities concerned. Data collected was analyzed using frequency counts, Mean and Pearson Product Moment Correlation Coefficient. Findings from the study showed that, school-climate influences the academic performance of science students in Ibadan, Oyo State, Nigeria leading to the need to enhance proper constructs for better performance in science subjects. The study concluded that conducive school-climates play significant roles in the performance of science students, which invariably implies that improved students' performance can be achieved when school authorities pay deliberate attention to improving school-climate conditions. It was recommended among others that, schools should endeavor to create conducive environment such as provision of basic facilities, clear and effective communication channels and a cordial teacher-students relationship to facilitate learning and to improve students' academic performance in science subjects.

Keywords: Influence, School-climate, Students' Performance, Science Subjects, Biology, Chemistry, Physics and Further Mathematics



Introduction

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Teaching and learning become meaningful when the circumstances surrounding the process give room for both teachers and learners involved in the exercises to get result for their activities. Studies have shown that performance in school subjects could be attributed to the condition of school-climate which is an integral and indispensable component of the teaching and learning process. Indeed, no meaningful teaching and learning can take place in an unconducive school environment. It is, therefore, imperative that educational stakeholders should foster safe and secure school environments to facilitate increased learners' retention and better performances (Bear, Yang, Mantz, Pasipanodya & Boyer, 2014).

Numerous studies have shown that decline in the academic performance of science students at various levels could be attributed to where the process of teaching and learning of science takes place which has been attributed largely to the poor school-climates in institutions of learning (Allen, Gregory, Mikami, Lun, Hamre & Pianta, 2013). The issue of quality education goes beyond the curriculum or subject content but includes learning environment. Learning environment exerts influence on learners' academic performance which calls for attention by stakeholders in education (Kodzi, Oketch, Ngware, Mutisya & Nderu, 2014). A variety of factors determine the climate of a school environment. In the context of this study, the school is the organization on which learning as part of its operational process is made possible through the environment where the operation is being carried out. Studies have shown that that there are sets of essentials factors that make up school-climate which is a measure of interpersonal, academic, and professional interactions (Fall & Roberts, 2012). In a healthy climate, individuals and groups generally feel welcomed, respected, and valued by the institution. It is grounded in respect for others, nurtured by dialogue between those of differing perspectives, and is evidenced by a pattern of interactions among school community members (Archambault, Pagani & Fitzpatrick, 2013).

School-climate in this context is not about the local weather but about people's dispositions within the learning environment which leads to the outlooks and feelings of students about the learning environment. Such feelings include safety, attention, valuing with fair treatment and respect for learners' views when necessary (Baquedano-Lopez, Alexander & Hernandez, 2013). This is measured by acceptance and serenity enjoyed by learners while in school to learn, work and to achieve learning outcomes. Positive school climate provides an enriching environment for



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personal growth which on the long run helps to promote students' performance, coupled with other factors leading to overall school progress and development (Barile, Donohue, Anthony, Baker, Weaver & Henrich, 2012). What students learn about themselves in school through interactions is equally important as the academic knowledge they receive. On the reverse, in an unhealthy environment, individuals or groups often feel isolated, marginalized, and unsafe (Liu, Van-Damme, Gielen & Noortgate, 2015).

Studies assert that teachers, students and the relationship that exists between them shape the social climate of the school environment. This reflects on the physical and the psychological aspects of the school as well as the health of the students that are liable to change (Bear, Yang, Mantz, Pasipanodya & Boyer, 2014). The kind of feeling individuals has when coming to school are indicators of the climate of the school which will significantly affect learning and students' learning outcomes (Berkowitz, Glickman, Benbenishty, Ben-Artzi, Raz, Lipshtadt & Astor, 2015). The social climate of a school is another indicator of the school climate. The social climate of a school is evident in the teaching style and communication method that exists between students and teachers. A school environment that is not serene and decent cannot attract even the most willing students. Also, overcrowded classroom is not only repulsive but energy-sapping as students struggle and wrestle over sitting positions (Lucio, Hunt & Bornovalova, 2012). In some cases, students lean on the walls and hang near windows to listen to the teacher. As further discovered, students would do better in a class where the students and teachers enjoy conducive spaces (Bryan, Moore-Thomas, Gaenzle, Kim, Lin & Na, 2012). The importance of comfortable sitting position in the classroom cannot be overemphasized especially for science-oriented subjects that are quantitative in nature. When students sit in a semi-cycle style, those directly facing the teacher participated more than those at the sides; when students sat in rows lecture style, those in front participated more than those at the back, and those in the middle participated more than those at the sides (Bunting, Drew, Lasseigne & Anderson-Butcher, 2013). It is generally observed that students in the periphery of the classroom are spectators rather than actors in the classroom drama (Chase, Hilliard, Geldhof, Warren & Lerner, 2014).

In the same vein, sitting at the back of a classroom and absence from classes have negative effect on students' academic performance. There is a clear indication that the class arrangement and location affect learning. Classes that are built far away from hostels are often scanty during lectures



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especially in schools that do not have good road network and transportation system and the effect of weather such as excessive sun intensity and rainfall. Conducive classrooms that are not too far from the hostels encourage students to attend classes and these in turn affect their academic performance during examinations. Furthermore, an increase in absentees will reduce the score of the final examination. Students have been observed to avoid classes due to the inability of the teachers to use teaching methods that facilitate instruction and also make the experience worthwhile. A healthy climate has enthusiastic and hardworking students as well as dedicated and cooperating staff (Baquedano-López, Alexander & Hernandez, 2013; Cheema & Kitsantas, 2014).

Statement of the Problem

Measuring and controlling school climate is one of the first critical steps in promoting long term learning outcome of students. However, experiencing acute shortage of facilities for teaching and learning of science subjects in secondary schools could lead to counter productivity of teaching and learning experiences. A situation where there are inadequate school facilities in terms of number of classrooms and furniture corresponding to the number of students as well as large teacher-students ratio at various subjects would definitely hamper effective learning such as in a situation where students struggle for space in the classroom along with their teachers. There is a need for the provision of a conducive environment with adequate human and material resources necessary to encourage learning by students. It is against this background that this study focuses on the Influence of School-climate on Science Students' Performance in Ibadan, Oyo State, Nigeria.

This study aimed at investigating the Influence of School-climate on Science Students' Performance in Ibadan, Oyo State, Nigeria.

Specifically, the objectives of the study were to:

i. identify the prevailing school-climate at the Senior Secondary Schools in Ibadan, Oyo State, Nigeria; and

ii. investigate the influence of school-climate on Science Students' performance in Ibadan,Oyo State, Nigeria.

Research Question

The following research question was raised for this study.



@2024 International Council for Education Research and Training 2024, Vol. 02, Issue 03, 40-54 ISSN: 2960-0006 DOI: https://doi.org/10.59231/edumania/9054 What are the identified prevailing school-climates at the Senior Secondary Schools in Ibadan, Oyo State, Nigeria?

Hypothesis

The following hypothesis was tested as 0.05 level of significance:

H01: There is no significant influence of school-climate on Science Students' Performance in Ibadan, Oyo State, Nigeria.

Methodology

The study adopted a descriptive survey design, using questionnaire for data collection. The population of the study comprised of one thousand and seventy-two (1,072) senior secondary school II science students in Oluyole Local Government Area, which is one of the eleven (11) Local Government Areas within Ibadan Metropolis, but a semi-urban locality in Oyo State. Oluyole Local Government is one of the less populated semi-urban extensions of the city of Ibadan, from which a sample of two hundred and fifty (250) science students comprising one hundred and fifty-six (156) male and ninety-four (94) female students were drawn for the study through simple random sampling technique in significant proportion in order to eliminate any bias due to gender in the results. Purposive sampling technique was used to select ten (10) schools where all the science subjects considered for the study (Biology, Chemistry, Physics and Further Mathematics) are offered at the senior secondary schools in Oluyole Local Government, Oyo State. The selection of schools for the study was based on the following criteria: (i) Offering of Science Subjects (Biology, Chemistry, Physics and Further Mathematics) to Ordinary School Certificate Level (O' Level); Presentation of students for Senior School Certificate Examinations (SSCE) for not less than fifteen (15) consecutive years; Availability of science laboratories for practical classes; and having at least one qualify science teacher for each of the science subjects. Two instruments were used for data collections: (i) Self-made questionnaire and (ii) a Result Format for Students' records of their average scores in SS II science subjects (Biology, Chemistry, Physics and Further Mathematics) in previous terminal examinations. The Questionnaire was tagged: School Climate and Science Students' Performance Questionnaire (SCS²PQ). The instrument was a 5-point Likert scale, indicating Strongly Agree (SA) = 5, Agree (A) = 4, Disagree (D) = 3, Strongly Disagree (SD) = 2 and Undecided (UD) = 1 for rating students' perceptions of their school climate and



@2024 International Council for Education Research and Training 2024, Vol. 02, Issue 03, 40-54 DOI: https://doi.org/10.59231/edumania/9054 ISSN: 2960-0006 examination conductions. A mean value of 4.34 and 4.59 were considered as significant based on each group of responses from the participants, while those values outside the specified mean values were considered not significant. The research instruments were validated for face and content validity by three (3) experts in related fields before using them for data collection. In order to ensure that the instrument is reliable, the instrument was administered to twenty-six (26) senior secondary II science students in two (2) schools that were not part of the sample but within the population. Cronbach Alpha statistic was used for the reliability test and it was found to be reliable with reliability value of 0.82 gotten from the exercise before the final production was made for the study. The data collected were analyzed using descriptive statistics of frequency counts, percentages, arithmetic mean and grand mean in order to answer the research question raised for the study. Pearson Product Moment Correlation Statistic was used to test the hypothesis formulated at 0.05 level of significance.

Results

Research Question One: What are the identified prevailing school-climates at the Senior Secondary Schools in Ibadan, Oyo State, Nigeria?

To answer this research question, responses from students were analyzed and collated in tables 1, 2, 3 and 4, and the identified prevailing school-climates at the senior secondary schools in Ibadan, Oyo State, Nigeria are: the physical features, the emotional features, the school special features, and the school-climate during examination periods.

S/	Item	SA	Α	D	S	U	Mea	Decisio
Ν					D	D	n	n
1	My school is very spacious for learning	80	66	18	12	74	3.26	Reject
2	Classrooms in my school are well	235	11	1	0	3	4.90	Accept
	furnished							
3	Windows in our classrooms allow for	228	17	1	0	4	4.86	Accept
	cross-ventilation							

 Table 1: Responses on School-climate's Physical Features



-	@2024 International Council for Education Research and Training2024, Vol. 02, Issue 03, 40-54ISSN: 2960-0006DOI: https: https://doi.org/10.59231/edumania/9054							
4	My school science laboratories can	214	32	0	3	1	4.82	Accept
	accommodate students conveniently							
	during practical classes							
5	There are enough seats for all students to	153	78	5	1	13	4.44	Reject
	sit during science classes							
	Grand Mean						4.46	Accept

Source: Researchers' Field Survey

From table 1, the calculated grand mean for the responses was 4.46 while the mean values of item 2, 3, and 4 were greater than 4.46 which was the grand mean computed for table 1 and the decision on each of the items was accepted. Items 1 and 5 had mean values less than 4.46 and the decisions were rejected. This implied that school-climate in terms of physical features were conducive to enhance better performance of science students in science subjects at the Senior Secondary Schools in Ibadan, Oyo State, Nigeria.

S/	Item	SA	A	D	S	U	Mean	Decisio
Ν					D	D		n
6	Science teachers in my school are very friendly	185	59	0	1	5	4.67	Accept
7	My science teachers help us to understand difficult concepts in science subjects	218	22	7	2	1	4.82	Accept
8	Students get ready and prompt help on any challenge they face in science subjects	174	61	2	4	9	4.55	Reject
9	Adequate disciplinary measures are in place to correct misconducts by erring students	158	55	9	6	21	4.15	Reject

Table 2: Responses on School-climate's Emotional Features



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10	My school is well protected against any	161	82	4	1	2	4.60	Accept
	form of attack							
11	My school abhors any form of bullying	221	24	3	2	0	4.86	Accept
12	school authorities exhibit fairness and	152	81	1	0	7	4.48	Reject
	justice when dealing with issues			0				
	Grand Mean						4.59	Accept

Source: Researchers' Field Survey

From the responses in table 2, the calculated grand mean for the responses was 4.59 while the mean values of item 6, 7, 10 and 11 were greater than 4.59 which was the grand mean computed for table 2 and the decision on each of the items was accepted. Items 8, 9 and 12 had mean values less than 4.59 and the decisions were rejected. This implied that school-climate in terms of emotional features were conducive to enhance better performance of science students in science subjects at the Senior Secondary Schools in Ibadan, Oyo State, Nigeria.

S/	Item	SA	Α	D	S	UD	Mean	Decisio
Ν					D			n
13	There is recreational center to	149	81	9	2	9	4.44	Accept
	help students interact after							
	classes in my school							
14	There is a designated period for	139	73	4	6	28	4.16	Reject
	science examinations in my							
	School							
15	All the necessary materials	214	32	0	3	1	4.82	Accept
	needed for science							
	examinations are available in							
	my school							

 Table 3: Responses on School-climate's Special Features



-	@2024 International Council for Education Research and Training 202 ISSN: 2960-0006 DOI: https: https://doi.org/1							, Issue 03, 40-54 edumania/9054
16	Designated laboratories for all	189	48	3	0	8	4.61	Accept
	the sciences subjects are in my							
	school							
17	Science practical is carried out	124	52	5	7	62	3.68	Reject
	in Science Laboratories							
	Grand Mean						4.34	Accept

Source: Researchers' Field Survey

In table 3, the calculated grand mean of the responses was 4.34 while the mean values of item 13, 15 and 16 were greater than 4.34 which was the grand mean computed for table 3 and the decision on each of the items was accepted. Items 14 and 17 had mean values less than 4.34 and the decisions were rejected. This implied that school-climate in terms of special features were conducive to enhance better performance of science students in science subjects at the Senior Secondary Schools in Ibadan, Oyo State, Nigeria.

S/N	Item	SA	Α	D	SD	U	Mean	Decision
						D		
18	During science examinations, students are well spaced	213	33	1	2	1	4.42	Reject
19	During science examinations, students are not allowed to share equipment	188	56	1	2	3	4.70	Accept
20	My school avoids any form of distractions in the examination hall	175	69	1	0	5	4.64	Accept
21	Science examinations are well supervised in my school in a stipulated time.	153	78	5	1	13	4.44	Reject

Table 4: Responses on School-climate in Examination Periods



-	International Council for Education Research an)2, Issue 03, 40-54				
ISSN: 2960-0006DOI: https://doi.org/10.59231/edumania/922Our science teachers supervise187591034.71Accept								
	our science examinations							
	Grand Mean						4.58	Accept

Source: Researchers' Field Survey

Table 4 displayed the responses of students in science classes where the calculated grand mean of the responses was 4.58 while the mean values of item 19, 20 and 22 were greater than 4.58 which was the grand mean computed for table 4 and the decision on each of the items was accepted. However, items 18 and 21 had mean values less than 4.58 and the decisions were rejected. This implied that school-climate during examination periods were conducive to enhance better performance of science students in science subjects at the Senior Secondary Schools in Ibadan, Oyo State.

Responses from students collated in tables 1, 2, 3 and 4 also displayed the prevailing schoolclimates at the senior secondary schools in Ibadan, Oyo State where an item in table 1 on the physical features coined ''classrooms in my school are well furnished'' displayed the highest mean value of 4.90; an item in table 2 on the emotional features coined '' My school abhors any form of bullying'' displayed highest mean value of 4.86; an item in table 3 on the school special features coined '' All the necessary materials needed for science examinations are available in my school'' displayed highest mean value of 4.82; while an item in table 4 on the school-climate during examination periods coined '' Our Science Teachers supervise our Science examinations displayed highest mean value of 4.71. However, the prevalent school-climate at the senior secondary schools in Ibadan, Oyo State was found in table 1, item 2 which expressed that the classrooms at the senior Secondary Schools in Ibadan are well furnished. This therefore support the fact that when available furniture is in place for the teaching and learning of science subjects, students are more comfortable to receive instructions with rapt attentions thereby encouraging the rate of assimilation which results in better understanding especially in science classes.

Hypothesis Testing

Hypothesis One (H0₁): There is no significant relationship between school-climate and Senior School Science Students' Performance in Ibadan, Oyo State, Nigeria.



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Table 6: Descriptive Statistics for School-climate and Senior School Science Students'

			Performance						
			Mean	Std. Deviation	Ν				
School-o	climate		3.4779	0.62554	250				
Senior	school	science	students'3.5772	0.32108	250				
perform	ance								

In order to verify if a relationship exist between school-climate and science students' performance in Ibadan, Oyo State, Pearson Product Moment Correlation analysis was carried out and the result is shown below:

		School climate	Science Students'
			Performance
Pearson Correlation	School-climate	1.000	0.585
realson Conclusion	Science students' performance	0.585	1.000
Sig (1 toiled)	School-climate	0.00	0.000
Sig. (1-tailed)	Science students' performance	0.000	0.00
N	School-climate	250	250
1	Science students' performance	250	250

Table 7: Pearson Moment Correlation on School-climate and Science Students' Performance

The above table shows that the correlation coefficient between the two variables is 0.585 which is a positive relationship, implying that with enhanced school-climate, Science Students' Performance especially Ibadan, Oyo State would improve. Using p-value as a basis for decision making, it was seen that the p-value is 0.000 which is less than the 0.05, hence the decision to accept the alternative assumption that there is a significant relationship between school climate and science students' performance.

Discussion of findings

As opposed to the submissions of Fall and Roberts (2012), this study clearly shows that the climate of science classrooms matters and can do much to improve science students' academic outcomes,



@2024 International Council for Education Research and Training ISSN: 2960-0006

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thus highlighting the necessity and importance of interventions to support and improve school climate. Nonetheless, the lack of empirical evidence supporting recommended intervention strategies aimed at addressing school climate as a whole is apparent, as most of the interventions do not address the issues of school climate expressively. Many intervention programs with effective outcomes are mostly centered on one or more aspects of school climate, such as safety and violence or bullying prevention (Kodzi & Oketch, 2014; Liu, Van-Damme, Gielen & Noortgate, 2015; Lucio, Hunt & Bornovalova, 2012). However, not many studies known to the current researchers do a comprehensive study to address the issue of intervention program or guidelines that can confidently provide directions on how to implement guidelines in the social, emotional, and ethical abilities as well as tendencies of science students and their teachers in schools, which are based on the best knowledge available.

Furthermore, it was observed that school-climate is a changeable factor and documenting processes of change in school climate are not prevalent. This situation may stem from a well define, clear and suitable school climate, without which it is difficult to develop interventions that may then be evaluated for efficacy. Intervention guidelines could be put in place based on accurate monitoring, assessment processes, documentation and critically evaluated reports. For instance, developing a bank of case studies of schools that have successfully implemented significant school climate improvements could ameliorate the situations in schools all in a bid to assist the science students' performance (Chase, Hilliard, Geldhof, Warren & Lerner, 2014). An example is an indepth examination where a qualitative method such as interviews, focus groups, analysis, and detailed school observations with evidence of core variables to distinguish between a well performing and non-performing schools (Baquedano-López, Alexander & Hernandez, 2013).

The findings indicated that schools with serene environment typically promote comfortable school climate for learning science. This is however a combination of organizational and social climate factors which when implemented effectively by the school management could encourage learning and better performance in science subjects.

Conclusion

In conclusion, findings from the current study demonstrated that overall contribution of positive school-climate such as the physical features, emotional features, special features and the climate



@2024 International Council for Education Research and Training 2024, Vol. 02, Issue 03, 40-54 ISSN: 2960-0006 DOI: https://doi.org/10.59231/edumania/9054 of the school during examination periods could encourage science students' performance in science subjects and promote the drive towards scientific and technological development as well as the socio-economic advancement of the society.

Recommendations

This study recommended that schools should put in place the following:

1. necessary physical features needed for learning science subjects in school environments;

2. encourage the necessary emotional features that will encourage science students to learn science subjects;

3. necessary special features for science activities and for recreations; and

4. organize well planned examination periods that will encourage and sustain improved performance of science students in Ibadan, Oyo State, Nigeria.

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Received on Mar 07, 2024 Accepted on May 25, 2024 Published on Jul 01, 2024

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