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ABSTRACT

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ABSTRACT

This work was conducted to determine the impact of class-size and field trip on academic performance of biology students in senior secondary schools in Oke-Ero Local Government Area, Kwara State, Nigeria. The study raised two (2) research questions and three hypotheses to guide the study. A survey descriptive research method was adopted for this study. The population for the study was all the biology students in secondary schools in Oke-Ero Local Government Area, Kwara State, Nigeria. A sample of 480 SSS II biology students was selected using simple random sampling technique. The data was gathered with the use of structured questionnaires and proforma. The findings of the study revealed a significant impact of class size on academic performance of biology students in senior secondary schools. It also found a significant impact of field trips on academic performance of biology students in senior secondary schools. Furthermore, the study found a significant relative impact of class size and field trips experiences on students' academic performance in biology. From the finding of the study it was recommended among others that school authority and teachers should ensure that the number of students in a class should not exceed 35 and encourage field trip activities for students' learning. Also, School administrators must decongest the overcrowded classes in the school so that the students can learn better and ensure that the students go on a field trip at least once in a term and the school authority should encourage and support both parents and teachers.

Keywords: class size, field trip, biology, academic performance.

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I. INTRODUCTION

The capacity to communicate, solve issues, and make choices is all boosted by the information and abilities students acquire throughout their learning. The future of both young people and the country can be traced back to how well they do in school, and this is particularly true at the secondary level. Learning is the means through which both individual and national educational objectives may be attained. As a result of the growing public interest in students' learning outcomes, researchers have been laboring to identify the obstacles to their success. The rate of failures in external examinations administered by the National Examination Council (NECO) and the West African Examinations Council (WAEC) establish secondary school students' poor approaches to learning (Obiakor & Oguejioffor, 2020).

According to Egwu and Okigbo (2021),the students' lack of motivation to learn biology islinked to the poor performance in the subject, while Dinah (2013) noted that a lack of science resources that could give students firsthand information was also a factor. Egwu and Okigbo further stressed that using instructional materials particularly the real object or natural ones is

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important for students' success in biology since the subject calls for the use of concrete items and activities/experiments to help students make connections between abstract ideas. Students sometimes struggle to grasp certain biological concepts which may be due to issues related to the class condition or in ability to see things the way they are. NPE (2009), the National Policy on Education, states that one of the goals of a biology student's biology education should be to provide them with information and abilities to perform well in a laboratory or field setting. Field studies, guided discovery labs, and other similar methods are emphasized throughout the curriculum as ways to reach the learning goals. The disturbing trends of poor performance by students in biology may be attributable to a number of variables, which can betraced to the class size and inability to engage students with activities like hands-on investigations in the field.

It's well accepted that a classroom's total enrollment has a significant influence on the quality of teaching and its students' academic performance, particularly public ones. In Nigeria, the average number of students per classroom varies from one educational level to another which sometimes relate with available infrastructures in the school. Class sizes of 20 for pre-primary, 30 for elementary, and 40 for secondary are recommended by the National Policy on Education (National Policy on Education, 2004). This is an indication that if the students' number in a classroom is more than the maximum allowed by policy, the classroom is considered overcrowded. For secondary schools, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) advise a ratio of 1:35 teachers to students (UNESCO, 2006).

Makinde (2012) argues that a classroom's size may be thought of as the total number of members in a learning group. Fewer students in a class means the teacher have more space to move about and more control over the environment, which in turn makes learning simpler for everyone. Lessons are less engaging and effective when there are too many students in the classroom, and there is more noise and student conflict (Marcus, 2010).

When there are fewer students in the classroom, students may choose to pay closer attention to the teacher. There are a few ways in which the number of students in a class might impact the amount of information that is retained. It may, for instance, have an impact on how students talk to one another; it might cause disruptive student behaviour; limiting the teacher's options for classroom improvement. Due to this, the teacher's ability to provide attention to each student, rather than the class as a whole, is diminished. Having a smaller class size allows teachers to better tailor their instruction to the individual needs of their students. How much content can be covered, for instance, may be affected by the class size because of the teacher's limited time (Muhammad, Muhammed and Fatihi, 2021&Willms, 2001).

Comparatively, when there are too many students in a single classroom, then the class is said to be overcrowded. An overcrowded class is one in which the teacher has trouble providing enough one-on-one instruction to each student. Some students sitting on the floor, students sharing books, and insufficient teaching materials and lighting systems are all signs of overcrowding in a classroom. The teacher finds it difficult to move around the classroom easily since there isn't enough space (Muhammad, Muhammed and Fatihi, 2021).

Students' performance in biology classes may suffer if they are too uncomfortable in overcrowded classrooms. According to Opare (2013), overcrowded classrooms are disruptive to instruction, detract from students' ability to focus, and may even lead to physical altercations. Students in overcrowded classrooms sometimes waste school time playing, playing outdoors, picking mangoes and cashews, or even swimming in the streams (Adeyemi, 2008). According to Umoren (2011), the ideal number of students in a classroom is between 20 and 35. A classroom like that is visually appealing, and the students seem to be engaged in the lessons being taught. In his view, management and control of the classroom are constantly at an all-time high. Students are discouraged from becoming disruptive or even hostile in such a setting.

The impact of class size on students' performance in biology was investigated by Ezekiel (2015) in the Abak Education Zone of Akwa Ibom State. Class size was shown to have a considerable effect on students' performance in biology and other subjects. There is a considerable impact of class size on students' academic performance in biology, according to a study conducted by Etim (2016). Studying the impact of smaller classes on students' ability to do well on the JSSCE, Tobih, Akintaro, and Osunlana (2013) revealed that a statistically significant link exist between the number of students in a class and how well they did in school. They concluded that the number of students in a class was a key factor in how well students perform in school.

Going on a field trip in biology is not really the main event, but rather serves as a means to an end in facilitating more effective instruction. When a teacher successfully gets the information (message) through in a way that will achieve the intended goals, and when students demonstrate mastery of the material via assessment, they have engaged in effective teaching. The goal of taking secondary school students out into the natural world on a biology field trip is to improve their understanding of the subject through direct engagement with experts and the environment. Learning outside the classroom aims to provide opportunities for all learners to participate in high-quality outdoor learning activities, and these centers were designed to provide better resources for first-hand knowledge than the school (Ahmad, 2014). According to Prem (2012), field trip is a kind of educational excursion in which students and teachers go to an off-campus location to do research or participate in other types of hands-on learning related to a certain topic. It might mean going on trips to different locations to learn about them firsthand by seeing them in their natural habitats (Obeka 2010).

In addition to traditional classroom activities, field trips may also include activities like hands-on investigations in the field or a visit to a botanical garden. Numerous good outcomes may be attained with field trips, including but not limited to: hands-on, real-world experiences; high-quality education; favourable attitudes toward science; motivation for the subject; and the building of rapport between students and teachers. Students may learn more about a topic and acquire new insights into it by going on a field trip and seeing it in action in its natural setting outside of the classroom. This allows students to see things for themselves and experience things with their own senses, rather than just hearing about them. Among the many positive aspects of field trips is the fact that they provide immediate and easy access to the information being learnt. Students benefit from the change in pace and environment afforded by time spent away from the school grounds, and from the social interactions they have while doing so. No matter how interested a learner may or may not already be in science, going on a field trip is a great way to pique their curiosity and get them actively involved in the subject (Omeodu & Abara, 2018). Students develop their powers of observation, perception, and objective reporting of observations via hands-on experience on field excursions (Shakil, Faizi & Hafeez, 2011). Students develop and become more curious and creative real-world observers as a result.

Students' enthusiasm for learning could be sparked by field excursions, which encouraged them to ask questions, seek out information, and share their insights with their classmates. The site of scientific field excursions not only has an impact on the students' education but also provides them with an opportunity to learn about the surrounding area and community (Behrendt & Franklin, 2014). Among the many benefits of organizing field excursions for students are the development of their presenting and observational abilities, the promotion of student interest and motivation in the topics being studied; the development of interrelationships; and the improvement of social interactions (Behrendt & Franklin, 2014).

The phrase "field trip" has been widely used by educators all around the globe for many years. Both teachers and students find this to be fascinating and encourage learning (Ahmad, 2014).Omeodu and Abara (2018) and Egwu and Okigbo (2021) all at different times found that students experience during field trip significantly

contribute to the improvement in their academic performance in science subjects. Given this context, the goal of this study is to investigate the impact of class-size and field trip on academic performance of biology students in senior secondary schools in Oke-Ero Local Government Area, Kwara State, Nigeria.

II. STATEMENT OF THE PROBLEM

Based on the recommendation of UNESCO, the student-teacher ratio in secondary schools is 1:35. The goal here is to facilitate productive interaction between the teacher and the class. As observed by the researcher, due to population expansion and financial shortfalls, public and some private schools have increased class sizes above what is considered reasonable and it appears that there is no provision for infrastructures that could accommodate this population. In today's overcrowded classrooms, students are unable to get as much as expected out of instruction as they could in the past, which has a negative impact on the overall quality of education in the nation. The strategy adopted by the teacher in teaching biology in secondary school has been traced to the poor performance of students in the subject. Teaching biology in abstract when the concepts taught are based on what one can see or happens in the immediate environment.

Biology field trips are expository in nature; they explain, elucidate and expatiate more on the teaching-learning process. These natural settings are used as extension to biology laboratories and enhance new discoveries by students which the biology curriculum is in support of. However, owing to the high cost of education, there are periods when fewer resources are devoted to improving classroom performance. It's possible that the majority of biology teachers have no idea where they should take their students on field trips. It could be as a result of the poor attitude towards field trip by teachers, students, government and other stakeholders of education. Hence, the study investigated the impact of class-size and field trip on academic performance of biology students in senior secondary schools in Oke-Ero Local Government Area, Kwara State, Nigeria.

Research Questions

1. What is the impact of class size on academic performance of biology students in senior secondary schools?
2. What is the relationship between field trips experience and academic performance of biology students in senior secondary schools?

Research Hypotheses

Three hypotheses corresponding to research questions were formulated to guide the study:

1. There is no significant impact of class size on academic performance of biology students in senior secondary schools
2. There is no significant impact of field trips on academic performance of biology students in senior secondary schools
3. There is no significant relative impact of class size and field trips experiences on students' academic performance in biology.

III. METHOD

For the purposes of this study, a descriptive survey research approach was used for the investigation. The population of the study consisted of all the biology students in senior school two (SSSII) in the Oke-Ero Local Government Area (LGA) of Kwara State. A sample of 480 SSS II biology students were selected using simple random sampling technique from a purposively selected eight (8) secondary schools out of fourteen (14) public secondary schools in the LGA considering varieties of class sizes among the schools. The data was gathered with the use of structured questionnaires and proforma. Students were given the questionnaire in their schools so in order to get honest answers from them on their demographics, their experiences during field trip and in the classroom. In order to compile students' final biology results, the Proforma was employed to collect their two terms results. The questionnaire consisted of two sections, the first section sort for the demographic information of the respondents while the second section consisted of 15 items on the respondents' field trip experience and the learning of biology. For reliability test of the questionnaire, a test retest method was adopted. Twenty biology

students from a secondary school outside of the study area were given the instrument twice within a two-week period. A Pearson Product Moment Correlation analysis was carried out on the collected data, yielding a correlation value of 0.783.The research instruments were later administered on the students. After retrieving the instrument from the respondents, the data was collated and analysed. The data was analysed using descriptive and inferential statistics. The hypotheses were tested at a 0.05 level of significance.

IV. RESULTS

Research Question 1: What is the impact of class size on academic performance of biology students in senior secondary schools?

Table 1: Mean and Standard Deviation of Students' Performance by Class Size

CLASS SIZE	N	MEAN	STD. DEVIATION
21 - 30 STDS	225	56.160	14.651
31 - 40 STDS	147	48.469	13.108
ABOVE 40	108	45.250	13.210
Total	480	51.350	14.613

Table 1 reveals the mean and standard deviation of the performance of students by their class size in biology. The class where there are 21 to 30 students had a performance mean score of 56.160 and standard deviation of 14.651; the class with the population of 31 to 40 students had performance mean score of 48.469 and the standard deviation is 13.108; and the class with over 40 students had the performance mean score of 45.250 and the standard deviation of 13.210. This is an indication that students in the class with lower population perform better than their counterparts in a class with larger population. The lower the population of the students in a class the better the chances of the students having good performance in biology.

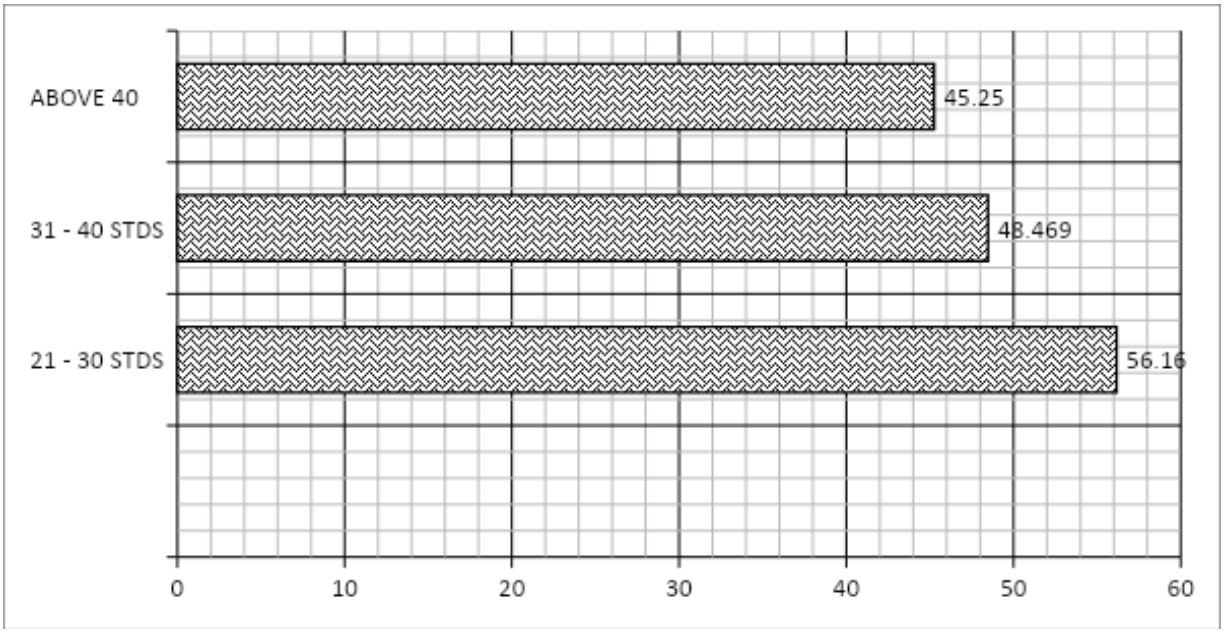

Figure 1: Bar Chart showing Students' Performance Mean Score by Class size

Research Question 2: What is the relationship between field trips experience and academic performance of biology students in senior secondary schools?

Table 2: Relationship between field Trip and academic performance of students

	N	Mean	Standard Deviation	R
Performance	480	51.350	14.613	0.606
Field Trip	480	2.753	0.357	

Table 2 shows the relationship between students' field trip experience and their academic performance in biology. The performance mean score of the students as revealed in the table is 51.350 and the mean rating of the students' responses on field trip experience on a 4-point rating scale is 2.753 while the standard deviations are 14.613 and 0.357 respectively. The table also revealed a correlation coefficient of 0.606. This is an indication that a strong positive relationship exist between the field trip experience of students and their academic performance in biology.

Hypotheses Testing

Hypothesis 1: There is no significant impact of class size on academic performance of biology students in senior secondary schools

Table 3a: Multiple Regression Analysis of Class Size and Students' Academic Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.312(a)	0.097	0.095	13.89845

a Predictors: (Constant), Class Size

Table 3a shows the impact of the Class Size in explaining the students' academic performance. It shows that the class size positively influence students' academic performance in biology. The table indicates that the correlation coefficient R is 0.312, which shows a positive relationship between the predictor variable and the criterion variable. R square is 0.097 which implies that 9.7% of the observed variance in students' academic performance in biology is accounted for by the predictor variable.

Table 3b: Analysis of Variance (ANOVA) for the Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9955.474	1	9955.474	54.538	0.000[b]
	Residual	92333.726	478	193.167		
	Total	102289.200	479			

a Predictors: (Constant), Class Size

b Dependent Variable: Performance

The data in table 3b revealed that the ANOVA yielded F(1, 478) = 54.538, p<0.05, which is significant. Hypothesis one is thus rejected. This indicates a significant impact of class size on academic performance of biology students in senior secondary schools.

Hypothesis 2: There is no significant impact of field trips on academic performance of biology students in senior secondary schools

Table 4a: Multiple Regression Analysis of Field Trip and Students' Academic Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.606(a)	0.367	0.366	11.63484

a Predictors: (Constant), Field Trip

Revealed in Table 4a is the impact of the field trip in explaining the students' academic performance. It shows that the field trip positively influence students' academic performance in biology. The table shows that the correlation coefficient R is 0.606, which shows a positive relationship between the predictor variable and the criterion variable. R square is 0.367 which implies that 36.7% of the observed variance in students' academic performance in biology is accounted for by the predictor variable.

Table 4b: Analysis of Variance (ANOVA) for the Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37582.559	1	37582.559	277.629	0.000[b]
	Residual	64706.641	478	135.370		
	Total	102289.200	479			

a Predictors: (Constant), Class Size

b Dependent Variable: Performance

The data in table 4b revealed that the ANOVA yielded F(1, 478) = 277.629, p<0.05, which is significant. Hypothesis two is thus rejected. This indicates a significant impact of field trip on academic performance of biology students in senior secondary schools.

Hypothesis 3: There is no significant relative impact of class size and field trips experiences on students' academic performance in biology.

Table 5a: Multiple Regression Analysis Model Summary of Predictor Variables (Class Size and Field Trip) and Students' Academic Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.647(a)	0.419	0.417	11.16245

a Predictors: (Constant), class size, field trip

Table 5a shows the combined impact of the predictor variable (class size and field trip) explained the criterion variable (students' achievement in biology). The data in the table shows that the predictor variables (class size and field trip) positively influence students'

performance in biology. The table indicates that the multiple correlation coefficient R is 0.647, which shows a positive relationship between the predictor variables and the criterion variable. R square is 0.419, which implies that 41.9% of the observed variance in student academic performance in biology is accounted for by the predictor variables.

Table 5b: Analysis of Variance (ANOVA) for the Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42854.854	2	21427.427	171.969	0.000[b]
	Residual	59434.346	477	124.600		
	Total	102289.200	479			

a Predictors: (Constant), class size, field trip

b Dependent Variable: Performance

Table 5b shows the ANOVA of the multiple regression data, which indicated that F(2, 477) = 171.969, p<0.05 is significant. Hypothesis three is thus rejected. This implies that there is a significant relative impact of class size and field trips experiences on students' academic performance in biology.

Table 5c: Test of Significance of the Regression Coefficients of Predictor Variables on the Criterion Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.822	4.622		-.394	0.694
	Field Trip	23.523	1.448	0.573	16.249	0.000
	Class Size	-4.205	0.646	-.229	-6.505	0.000

a Dependent Variable: Performance

The result presented in table 5c shows that the beta weight for class size and field trips are 23.523 and -4.205 respectively. The two predictors are found to be significant at 0.05 level of significance. This is an indication that class size, and field trip experiences areboth good predictor of students' academic performance in biology. Field trip experience made the highest contribution. The derived regression equation is:

P = 23.523(FT) – 4.205(CS)– 1.822. This simply implies that the class size and field trips experience had regression coefficients of 23.523 and -4.205, respectively with a constant of –1.822.

V. DISCUSSION

The finding of the study revealed that a significant impact of class size on academic performance of biology students in senior secondary schools. It is further revealed that students in the class with lower population perform better than their counterparts in a class with larger population. This implies that the lower the population of the students in a class the better the chances of the students having good performance in biology. This concur with Ezekiel (2015) and Etim (2016) who at different time and different location found that class size have a considerable effect on students' performance in biology and other subjects. This could also implies that a crowded

class could make students to be distracted due to some events that might be unseen or uncontrollable for the teacher and invariably students find it difficult to learn under such atmosphere.

The study also revealed a significant impact of field trips on academic performance of biology students in senior secondary schools. This could implies that going on a field trip gives the students access to firsthand information about a particular concept and they could see for themselves how real some concepts are. Most time, explaining how a concept works in class may not be adequate in providing students with the required knowledge acquisition but when the students are able to see in reality how these things work, they tend not to forget easily and understand better. This agrees with the findings of Omeodu and Abara (2018) and Egwu and Okigbo (2021) who all at different times found that students experience during field trip significantly contribute to the improvement in their academic performance in science subjects.

The finding also revealed that there is a significant relative impact of class size and field trips experiences on students' academic performance in biology. This implies that both class size and field trip experience have combined impact on the academic performance of students in biology. This also indicates that the class size could even have impact on students' field trip experience.

VI. CONCLUSION

On the basis of the findings, it was established that a larger class size and a more engaging field trip both positively impacts students' biology outcomes. It also concludes that students' low biology performances were aided by overcrowded classrooms since they were unable to concentrate. It's also concluded that students' biology performance increased after they went on a field trip since they had the chance to gain knowledge that would stick with them for a while.

RECOMMENDATIONS

It is recommended based on the findings of the study that:

1. School authority and teachers should ensure that a class does not have more than 35 students.
2. School administrators must decongest the overcrowded classes in the school so that the students can learn better.
3. Biology teachers should ensure that the students go on a field trip at least once in a term.
4. The school authority should encourage and support both parents and teachers to allow students in embarking on field trip.

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