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Factors that affect the performance of students in Senior Secondary School Biology Examination: a case-study in Abeokuta South Local Government Area of Ogun State

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ABSTRACT

Background: Biology which is the fundamental science subject has been known to continuously record low students' enrolment, interest and poor achievement levels in all examinations – both internal and external.
Objectives: The research work was designed to investigate the contributory factors responsible for the performance of students in Senior Secondary School Biology Examinations in Abeokuta South Local Government Area of Ogun State.
Methods: The research adopted a descriptive survey research design. The population comprises all secondary school leavers especially those who have attempted biology examination in Abeokuta south local government area. 120 respondents were carefully selected using a simple random sampling method with sex as the stratum. Using a convenient sampling method, 20 respondents were selected each from 6 continuing educational coaching centers across the Local Government Area (L.G.A.). Questionnaires were administered to 120 participants; only 109 of the questionnaires were retrieved. The data collected were subjected to simple descriptive statistics ,especially percentile.
Results: It was observed that student's attitude, inadequate resource materials, inadequate qualified biology teachers, availability of laboratories and frequency of practical classes significantly affected the performance of students. However, the teacher's attitude had no significant effect on their performance.

Keywords: Students, Teachers, Biology, Performance, Examination

INTRODUCTION

Biology is a unique subject that deals with living things (organisms). It was once a compulsory subject for science students in the Senior Secondary School when the 6-3-3-4 system was in place. The recent policy system and curriculum review which led to the introduction of the 9-3-4 system have excluded biology from the compulsory core sciences. However, biology is still relevant and required for admission into higher institutions especially for almost all science-related courses. It has been observed that students are increasingly finding it difficult to pass the subject at both the West African Examination Certificate (WAEC) and the National Examination Council (NECO). Ali *et al*. (2014), noted that Biology which is the fundamental science subject has been known to continuously record low students' enrolment, interest and poor achievement levels in all examinations – both internal and external.

The analysis revealed that the performance over the years has been discouraging, this reveals the fact that there are some underlining factors which may be responsible for this trend. These factors may be multifaceted, ranging from the students' or teachers' attitudes, inadequate instructional materials and lack of laboratories to mention a few. Lebata and Mudau (2014) have observed that most learners perform below average due to a lack of motivation and interest. Umeh. (2002) also revealed that the nonchalant attitude of students and teachers in the Senior Secondary Schools towards certain concepts in the Biology curriculum also accounts for poor performance in the subject. Njoku. (2006), Ugwu. (2007) and Nwagbo and Obiekwe. (2010) in their findings identified several factors that contribute to the level of difficulty in the teaching and learning of science. These according to them include

teaching methodology, lack of qualified teachers, school setting (location), students' ability and teachers' effectiveness. Okebukola. (2002) referred to these factors as barriers. Agboghoroma and Oyovwi. (2015) in their work, concluded that the use of concept-mapping instructional strategy was more effective and superior to the Regular teaching method (Conventional teaching method) in improving students' achievement in Biology. This is based on the fact that the strategy will make Biology teachers to adequately plan, prepare for lessons and present lessons that will enhance learning. Dinah (2013) concluded that availability of textbooks, laboratory apparatus and other learning resources contribute significantly to the performance of students in Biology examination. He added that students with a positive attitude towards the subject register better performance than those who had a negative attitude. Those with a positive attitude are motivated to work hard and this is reflected in the good marks scored in the examination. Aniemena (2003) pointed out that the use of a fairly well – equipped laboratory in schools has been linked to student's better performance.

Daworiye *et al*. (2015) in their research, affirmed that six most important factors inhibiting effective teaching and learning of biology include: insufficient teaching and learning resources, lack of well-equipped laboratories, students' poor communication skills, poor students' attitude to biology, non-conducive classroom environment and overloaded biology curriculum. Teachers' lack of the knowledge of subject matter and inadequate motivation were among the factors also listed as inhibitory to the effective science teaching and learning. Ibole (2000) stated the lack of infrastructural facilities, overload curriculum, lack of training programmes/workshops and lack of skills in handling difficult concepts as factors that contribute to the problems of teaching biology.

According to Manalanga and Awelani (2014), practical Biology Examination if highly scored improves the Senior Secondary Certificate Examination (SSCE) grade. They suggested more practical lessons and documentation for proper preparation and planning (Wabuke, 2013). The West African Examination Council's Chief Examinations report (2006) concluded that candidate's weakness in performing well in biology is linked to practical Biology especially in poor drawing skills.

On teacher's attitude, Azodo (1999) revealed that some teachers who teach this subject sometimes concentrate on the few who are brilliant while some are not efficiently and effectively teaching the students as expected. Ibrahim (1999) buttressed this by concluding that the employment of teachers who do not have adequate in-depth knowledge of the subject matter worsens the situation. It was observed that some teachers dispense the teaching and learning process to the students in haste, full of flaws, faults and bad mannerisms.

Oshodi (1998) revealed that one of the more enduring contentions however is that the low teacher/student's ratio, shortage of teaching-learningng facilities, among other things contribute to the decline in performance in biology.

PURPOSE OF THE STUDY

The study investigated the factors affecting the performance of students in senior secondary school Biology examination in Abeokuta South L.G.A in Ogun State.

STATEMENT OF PROBLEM

Biology is one of the core science subjects in secondary school, though it largely deals with the study of nature (living things) around us and should expectedly be a simple subject for students unfortunately, the reverse is the case. Researchers have observed an increasing decline in the performance of students at secondary school level over the years, this may be partly responsible for truncating the ambition of most prospecting students. These reasons form the basis of this research.

RESEARCH QUESTIONS

1. Do student's behavior and attitudes affect their performance in Biology?
2. Does frequency in carrying out experiments affect student's performance in Biology?
3. Is there any significance in the performance of students with textbooks, other resource materials and preparedness before the examination?
4. Does the presence of a substantive biology teacher and a laboratory affect their performance in Biology?
5. Does practical examination have any effect on student's performance in Biology?
6. Does a teacher's attitude affect a student's performance in Biology?

RESEARCH HYPOTHESIS

HO_1: Student's behavior and attitudes have no significant relationship with their performance in Biology.
HO_2: Frequency in carrying out practical and experiment has no significant relationship with student's performance in Biology.
HO_3: Performance of students with textbooks, other resources materials and performance and preparedness before the examination has no

significant relationship with their overall performance.

HO_4: The presence of a substantive biology teacher and a laboratory has no significant relationship with their performance on Biology.

HO_5: The practical examination has no significant relationship with student's performance in Biology.

HO_6: Teacher's attitude has no significant relationship with student's performance in Biology.

METHODOLOGY

The descriptive survey research design was adopted, the population comprises all secondary school leavers especially those who have attempted Biology examination in Abeokuta south local government area. The sample comprises of 120 respondents selected using simple random sampling method with sex as the stratum. Using a convenient sampling method, 20 respondents were selected each from 6 continuing educational coaching centers across the L.G.A. The research instrument used was questionnaires validated by an expert (supervisor) from the Institute of Education, University of Ibadan. 120 questionnaires were administered; only 109 of the questionnaires were retrieved. The data collected were subjected to simple descriptive statistics especially percentile.

RESULTS

From Table 1, the percentage for the positive (74.9%) response is greater than the percentage for the negative response (25.1%); the null hypothesis 1 which states that student's behaviorand attitudes has no significant relationship with their performance is rejected.

The percentage of positive response (60.5%) is greater than the percentage of a negative response (39.5%); the null hypothesis 2 which states that the frequency in carrying out practical and experiment has no significant relationship with student's performance in Biology is rejected. (Table 2).

The percentage of the positive response (77.1%) is greater than the percentage of a negative response (22.9%) (Table 3); the null hypothesis 3 which states that performance of students with textbooks, other resource materials and preparedness before the examination has no significant relationship with their overall performance is rejected.

The percentage of the positive response (81.7%) is greater than the percentage of the negative response (18.8%) (Table 4), therefore, the null hypothesis 4 which states that the presence of a substantive biology teacher and a laboratory has no significant relationship with their performance on Biology is rejected.

The percentage for the positive (87.6%) is greater than the percentage of the negative response (12.1%) (Table 5); the null hypothesis 5 states that the practical examination has no significant relationship with student's performance in Biology is rejected.

The percentage of positive response (45.9%) is less than the percentage of the negative response (54.1%) (Table 6); the null hypothesis 6 which states that the teacher's attitude has no significant relationship with student's performance in Biology is accepted.

DISCUSSION

Student's behavior and attitude affect the performance of Biology in senior secondary school examination. This finding is in agreement with Umeh (2002) who revealed that the nonchalant attitude of students and teachers in the Senior Secondary Schools towards certain concepts in the Biology curriculum is also responsible for poor performance. Daworiye *et al*. (2015) also supported this by listing among other factors, poor students' attitude to biology, as an inhibitor to effective science teaching and learning.

Table 2 indicated that the frequency of carrying out practical by students affects their performance in Biology. This affirms the work of Manalanga and Awelani (2014) who concluded that practical Biology examination if highly scored improves the Biology grade. Teachers should be encouraged to assess learners regularly on practical skills (Wabuke, 2013).

The availability of textbooks and other resource material and preparedness for the examination also affected their performances in Biology. This finding is in agreement with Dinah (2013) who concluded that availability of textbooks, laboratory apparatus and other learning resources contribute significantly to the performance of students in Biology examination.

The availability of a substantive biology teacher and a laboratory affects the performance in senior secondary school examinations in Biology. This is similar to the reports of Ibole (2000), Njoku (2006), Ugwu (2007) and Nwagbo and Obiekwe (2010) who identified several factors that contribute to the level of difficulty in the teaching and learning of science. These according to them

Table 1: Percentile summary of Yes and No response of student's behavior and attitude

S/N	Questions	Frequency of No.	Frequency of Yes	Total
1	I normally enjoy Biology class	11	98	109
2	I tackled problems independently	27	82	109
3	I find some topics in Biology interesting	8	101	109
4	I find some topics in Biology difficult to understand	40	69	109
5	I consider Biology practical too strenuous	67	42	109
6	I adequately prepare before writing the examination	11	96	109
	Total	164	490	659
	Percentage	25.1%	74.9%	

Table 2: Percentile summary of Yes and No responses of student's frequency in carrying out practical in Biology

S/N	Questions	Frequency of No	Frequency of Yes	Total
7	I did well in practical Biology	26	83	109
8	I am very poor in drawing diagrams	66	41	109
9	I carry out practical and experiments in Biology regularly	58	51	109
10	There is a Biology laboratory in my former school	22	87	109
	Total	172	264	436
	Percentage	39.5%	60.5%	

Table 3: Percentile summary of Yes and No on the performance of students with resource materials and preparedness before the examinatio

S/N	Questions	Frequency of No	Frequency of Yes	Total
11	I had a Biology textbook	13	96	109
12	I practiced past questions before the exam	19	90	109
13	I attended extra – moral class in Biology	57	52	109
14	I adequately prepared for the examination before writing it.	11	98	109
	Total	100	336	436
	Percentage	22.9%	77.1%	

Table 4: Percentile summary of Yes and No responses of students on how the presence of substantive Biology teacher affects their performance

S/N	Questions	Frequency of No	Frequency of Yes	Total
15	We had a Biology teacher	22	87	109
16	I like my Biology teacher	18	91	109
	Total	40	178	218
	Percentage	18.8%	81.7%	

Table 5: Percentile summary of Yes and No on whether the practical examination affects their performance

S/N	Questions	Frequency of No	Frequency of Yes	Total
17	The practical aspect determined my grade in Biology	14	95	109
18	The theory and objectives part determined my grade in Biology	13	96	109
	Total	27	191	218
	Percentage	12.4%	87.1%	

Table 6: Percentile summary of Yes and No responses of students about teachers' attitudes on students' performance

S/N	Questions	Frequency of No	Frequency of Yes	Total
19	I like my Biology teacher	17	92	109
20	My Biology teacher covered the syllabus before the exam	59	50	109
	Our teacher used computer or videos aided software for teaching Biology	101	8	109
	Total	177	150	327
	Percentage	54.1%	45.9%	

include teaching methodology, lack of qualified teachers, school setting (location), students' ability and teachers' effectiveness. Oshodi (1998) reported that one of the low teacher/student's ratio, shortage of teaching-learningng facilities overloaded time table and other first-level variables are the major contributing factors to the observed decline in performance. Practical Biology examination affected their performance in senior secondary examination. This result is supported by the West African Examination Council's Chief Examinations' report (2006). Finally from Table 6, given the stated hypothesis, the teacher's attitude has no significant relationship to the students' performance in Biology in senior secondary school examinations.

CONCLUSION

Student's behaviour and attitude affect their performance positively in Biology. The frequency of students carrying out experiments influenced their performance positively. Lack of laboratory in the school affected the performance of students negatively in Biology. The availability of substantive Biology teacher in the school affected their performance positively. The teacher's attitude had no significant effects on student's performance in Biology. Students with textbooks, resource materials and adequate preparation before examination performed well in their Biology examination. The practical Biology examination affected the students' performance positively in Biology. Teachers should encourage students to get past questions in Biology while also reading intensively for the examination.

Teachers may also use some of the past questions in their terminal examinations. Students should be encouraged to develop an interest in the subject and to practice biological drawings as much as possible. Teachers need to make practical classes interactive and encourage drawing at least two specimens in a practical class; carry out practical and experiment as much as possible (at least once a week). There is need for government to build more laboratories in all schools. Parents Teachers Association in conjunction with old students association of schools may build well-equipped laboratories in all schools; public and private partnership initiatives should be explored to provide more facilities in schools. Teachers should be encouraged to use computer-aided teaching or instructional materials in schools.

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