Academic Performance in Biology at Secondary School Certificate Examination (SSCE) and the Influencing Factors among Students in Owerri Municipal of Imo State, Nigeria.

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Abstract

Senior secondary school certificate examination (SSCE) is the final examination uniformly conducted for secondary school students in the English speaking countries of West Africa. Despite the fact that the students in these schools were taught under the same curricula and in many cases under the same administrative supervision, performance vary widely from one school to another. The variation in performance is not only in overall school performances but the standard and grades achieved by those that passed. This study is undertaken to ascertain the possible factors that account for diverse academic performances in Biology subject among the students in these institutions. The SSCE results in Biology for five consecutive years from 2009-2013 were collected from each of five schools with the cooperation of the school Principals. The grading of the academic performances of the student were classified into four categories. For sampling information from the teachers and students on the factors that affect academic performance, different structured questionnaires were prepared for the two groups. Findings revealed that academic performances in Biology in the schools under investigation were widely different in term of general scores per schools and candidates. Teachers' factors, school's factor, students' factor and parents' factor were in that order responsible for variations in academic performances in the schools. It is recommended that schools under same administrative management should be uniformly staffed and equipped by the government. Moreover, school management structure should properly integrate students welfare especially health into school planning.

Introduction

The Senior Secondary School Certificate Examination (SSCE) is the final examination that

secondary students undertake for the final award of certificate. It is an examination annually conducted uniformly in all the English speaking West African countries for all the Secondary Schools. All the students of these secondary schools undertake this examination at the same time between May and June each year. This invariably means that all the students are being taught under the same curriculum. Biology is usually one the core subjects that participating students are expected to enroll into.

There had been worldwide recognition of importance of science and thereby science education in national development and this has found a central place in the curricula of schools at all levels (Ogbonna, 2007). According to Olasehinde and Olatoye (2014), Science education is designed to guide the world toward a scientifically literate society and this is important for an understanding of science as it offers personal fulfillments and excitements. Biology is usually regarded as the most simple to understand among all the science subjects and thus it is the one that usually attract the widest enrolment. Ofoegbu (2003) had asserted that Biology has a large student enrolment than any other science subject especially at the upper basic level of the Nigerian education. Despite the fact that Biology is the simplest to comprehend among the science subjects, the level of academic achievement is nonetheless not much different from other science subjects among the students. According to Akubuilo (2004), in spite of the popularity of Biology among students, the failure rate has remained very high.

All stakeholders in the education of the youths are concerned about low level of achievement in the educational pursuit with respect to the attainment of the educational objectives. Many researchers in Science education had been concerned about this downward trend and efforts to identify major factors with the aim of addressing them are being daily projected. The findings of the content analysis process revealed factors influencing the academic performance in Biology (Tom, Coetzee and Heyns, 2014). They therefore concluded that the main factor identified were biological science contents, characteristics of educators, educational strategies, resources and biological science assessment.

Purpose of this study.

According to Addae-Mensah (quoted by Otami, Ampiah and Anthony-Krueger, 2012), results released by WAEC in Biology have consistently indicated that schools that are well equipped in term of science laboratories, textbooks and qualified teachers tend to produce better results while poorly equipped schools perform poorly. Apart from the general low academic performance in Biology, the levels of performance usually vary from school to school. The variation in performance is not only in overall school performances but the standard and grades achieved by those that pass also usually vary from school to school. Thus while there are common factors that affect performances, the prevalence of these various factor could vary from school to school. It had been observed that schools that are managed by the same government agency are not often similarly attended to and equipped in term of number of teachers and teaching equipment. While students are being taught under the same curriculum and being supervised by the same examination body, the question arises on why there could be wide variation in performance at these different schools.

THE OBJECTIVES OF THE STUDY.

The objective of this study is to ascertain in one part the level of variation in academic performances at different schools and on the other hand the diversity of factors that could be responsible for the variations in performance.

METHODOLOGY

This study is experimental design to ascertain the trend in academic performances of students at SSCE at various schools in Owerri Municipal of Imo State, Nigeria within a spate of five years (2009-2013) and the factors responsible.

a. Study area: Imo State is at the South-Eastern part of Nigeria and Owerri is the capital city. The focus of this study is on Owerri municipal which is the central business district of the state. The city is located on longitude 7.01842^0 and latitude 5.497^O. There are eight (8) secondary schools within the area and five of these schools were randomly selected for this study because of certain limitation in the conduct of the investigation.

b. Population studied. This study is on five (5) secondary schools with a total population of 1878 biology students and 48 total number biology teachers. However, the sample students were 10% from each of the schools. Five teachers from each of the schools were also sampled. Thus, 120 students and 25 teachers that were randomly selected were the respondents in this study. The schools under this study were:

i. Owerri Girls Secondary School, Owerri.

ii. Development Comprehensive Secondary School, Owerri

iii. Govrnment College, Owerri.

iv. Holy Ghost College, Owerri.

v. Ikenegbu Girls Secondary School, Owerri.

c. Data collection: The WAEC SSCE result for five consecutive years from 2009-2013 were collected from each of the five schools with the cooperation of the school Principals. The grading of the academic performances of the student were classified into four categories. Those that had 'A' scores were classified as Excellent, those that had 'B' and 'C' were classified as Good while those that scored D and E were categorized Pass and those that failed were grouped Failed. The mean of each of the categories were calculated and compared. For sampling information from the teachers and students on the factors that affect academic performance, different structured questionnaires were prepared for the two groups. The questionnaires were subjected to validation test and found adequate for relevant information required for this study.

RESULTS.

The performance of the students from the different schools with respect to five years SSCE results was different for each of category of passes (see Table I). The school with the highest pass percentage was Owerri Girls Secondary School (90%) while the school with the lowest pass percentage was Government College (51%), (See Fig. I).
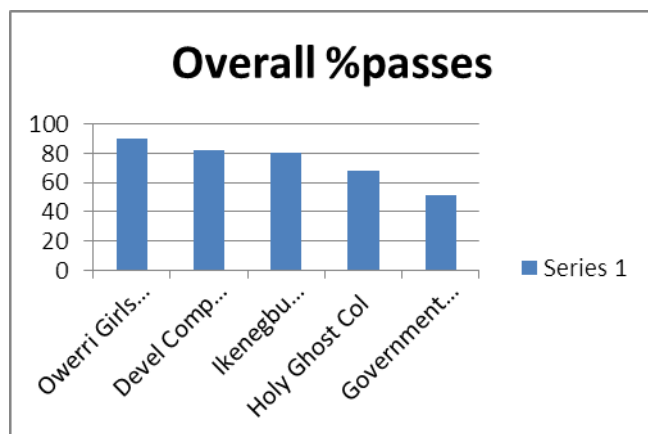
Fig. 1. Academic performances in Biology at the different Schools

TABLE I. THE EXAMINATION ENROLMENT AND NUMBER OF STUDENTS WITH THE CLASSIFIED ACADEMIC PERFORMANCE AT THE SCHOLS

Name of School	Total Enrolment	No. of students with grades				
	2009-2013	Alpha	Credit	Pass	Failed	%Pass
Owerri Girls Sec. Sch.	1184	53	539	472	120	90
Development Comp S.S	1327	81	434	563	244	82
Ikenegbu Girls S. Sch.	1850	93	449	937	371	80
Holy Ghost College	1334	83	341	483	427	68
Government College	1458	19	227	503	709	51

At Ikenegbu Girls Sec. S., though the percentage passes was relatively lower (80%) than at Owerri Girls Sec. S., the highest percentage passes at Alpha (excellent) level was recorded higher (6.2%) while at Owerri Girls S.S., pass level at alpha was 4.5%. Development Comp. S.S. with 82% pass rate next to the highest also had 6.1% pass rate at alpha level (see table II). Owerri Girls Sec. Sch. with the highest pass level had most of the passes at credit level (45%), but Ikenegbu Girls Sec. School had most of the passes at ordinary pass level (see Fig. II)
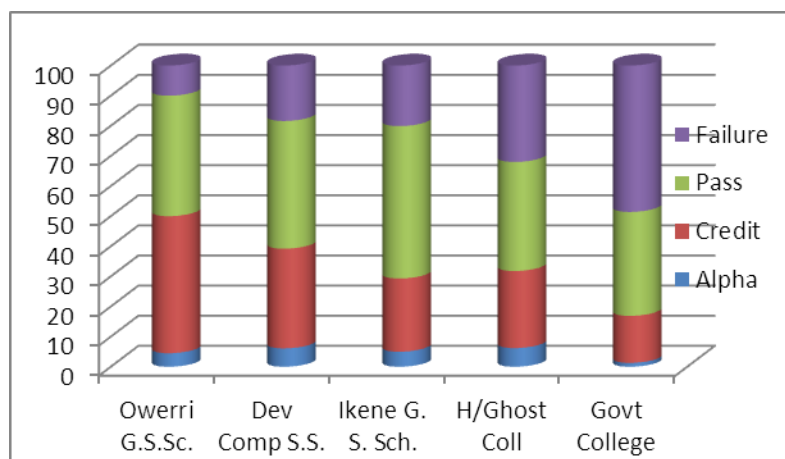
Fig. 2. The categories of pass level at the different Schools.

TABLE II. THE PERCENTAGE OF SCORES OF DIFFERENT GRADES AT THE SCHOOLS

Schools	Total % Pass	%Alpha	%Credit	%Pass	%Failure
Owerri Girls Sec. Sch.	90	5.0	50.7	44.3	10.0
Development Comp S.S.	82	7.5	40.5	52.0	18.0
Ikenegbu Girls S. Sch.	80	6.3	30.3	63.4	20.0
Holy Ghost College	68	9.2	37.6	53.2	32.0
Government College	51	2.5	30.3	67.2	49.0

The School with the highest percent passes at credit level and above was Owerri Girl's Secondary School (50%), while Government College still recorded the lowest (16.9%) (See table III). Factors affecting academic performance were categorized into teacher-based, school-based, student-based and parent-based. In all the categories, Owerri Girls Secondary School was most highly rated for teacher-based factor and other factors (see table IV). Government College was distinctly poor for the teacher-based factors (see table III). At Ikenegbu Girls Secondary School, the school-based factor was poor although the teacher-based factor was very highly rated (see Fig. 4).

TABLE III. NUMBER OF STUDENTS WITH PASSES AT CREDIT LEVEL AND ABOVE.

S/NO	Name of School	Total Enrol	Total Pass	% Pass
1	Owerri Girls Sec. Sch.	1184	592	50.0
2	Develop Comp. Sec. Sch.	1327	515	39.0

Name of Schools	Teacher-based	School-based	Students-based	Parents-based
Owerri Girls Sec. Sch.	93%	93%	78%	79%
Develop Comp. Sec. Sch.	60%	66%	70%	78%
Ikenegbu Girls Sec. Sch.	40%	33%	51%	42%
Holy Ghost College	40%	47%	63%	55%
Government College	33%	54%	63%	57%

3	Ikenegbu Girls Sec. Sch.	1850	542	29.3
4	Holy Ghost College	1334	424	31.8
5	Government College	1458	246	16.9

Fig.3. Ratings of factors that affect performance at the different Schools

The ways that factors affected academic performances were different at the schools. With most of these factors, the disparities was along the pattern of variation of the academic performances (See Fig.3). At Owerri Girls Sec. Sch., with the best level of academic performance, the teacher factor was rated best (93%) while Government College, the lowest in academic performance rating had 33% teacher factor rating. Ikenegbu Girls Sec. Sch., was lowest in ratings of other factors that affected academic performance (See Table IV)

TABLE IV. RATING OF THE FACTORS THAT AFFECT ACADEMIC PERFORMANCE IN THE SCHOOLS.
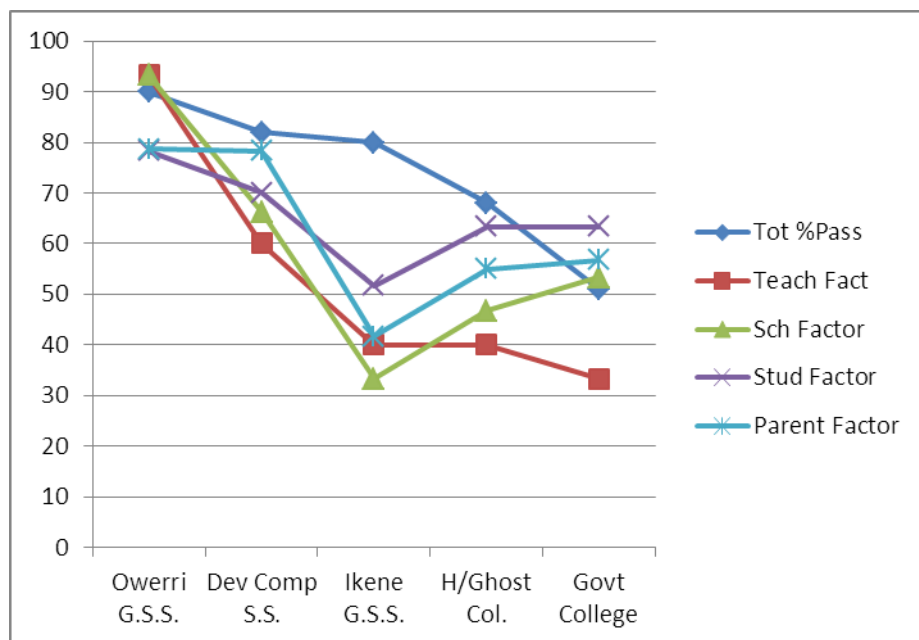
Fig.4. Ratings of factors that affect academic performances at the schools.

DISCUSSION.

All the schools under this study were public schools being managed by the State government; hence they were under common supervision. However, academic performances were different and from this study, factors that affect academic performance were different. While two of the schools were girls only schools, the rest were mixed schools. The School most highly rated in academic performance was a girls-only school. The school, Owerri Girls Secondary School, was also best rated for the four categories of factors that affect academic performance, namely teacher-based factors, school-based factors, student-based factors and the parent-based factors. Specific finding from this study indicated that most of the teachers (80%) from this school were professionally trained teachers compared with Government College where only 20% of the teachers were with teaching qualification. Moreover, the Teacher/students ratio was lowest at this School (1:47), compared with another School with ratio of 1:74 (Ikenegbu Girls Secondary School).

According to Ballone-Dura, Czerniak and Haney (2005), science teachers have been found to be most important factor in improving students' achievement in schools. Poor performance in the field of science is caused by the poor quality of science teachers, overcrowded classroom and lack of suitable and adequate science equipment among others (Ali, Toriman and Gasim, 2004). Teachers with required teaching qualifications will be expected to provide solutions appropriate for teaching method to impact knowledge. According to Akinfe, Olofinniyi, and Fashiku (2012), the role of professionally qualified/trained teachers is an important teacher quality which enhances students' academic achievement in biology. Moreover, Akubuilo (2004) had asserted that teachers' methodology has significant effect on students' performance in Biology. He then concluded that students under effective teacher's methodology are likely to come out with good performance while students who were not taught well will perform poorly.   This study did not

investigate the reason behind schools that were under the same government administration to be differently staffed in quantity and quality. However it could be reasonably concluded that the disparity in quality of staffing at the schools could account for better academic achievement of the students at Owerri Girls Secondary School.

 Findings in this study also revealed that teachers at Owerri Girls G.S. matched very adequately in their work the theory teaching with practical classes and this was better achieved than at the other schools. This is relatively higher (100%) compared with rating of 40% obtained with Government College that had the lowest academic performance rating. This can be accounted to the credit of the teachers and it can be asserted that the quality of work undertaken by teachers at Owerri Girls S.S. is better than obtainable at other schools.

The school-based factors that could affect academic performance were markedly different at the schools. These were more significantly different within the two schools that were Girls only institutions (93% rating at Owerri Girls Secondary School and 33% at Ikenegbu Girls Secondary School). This was reflected in the differences noted in academic performance rating difference in the schools. According to Addae-Mensah (2003), results released by WAEC in Biology have consistently indicated that schools that are well-equipped in term of science laboratories, textbooks and qualified teachers tend to produce better results while poorly equipped schools perform poorly in the subject. The finding from this study indicated that Owerri Girls Secondary School is best in term of standard laboratory, adequate laboratory equipment and provision of consumable materials. Hence this could have accounted for significantly better academic performance of Owerri Girls S.S. far above Ikenegbu Girls S.S. which were both girls' only schools. Akinfe et al (2012) had averred that without modern instructional materials, effective teaching and learning cannot be utilized

Also accounting for disparity in academic performance within the schools are the student-based factors. While this was not statistically different, it by no mean indicated a level of variation (Owerri Girls S.S. was rated 78% and Ikenegbu Girls S.S. was 51.7%). Mwamwenda (1995), had asserted that the achievement of students in a subject is determined by their attitudes rather inability to study. Students that are ready to learn either due to motivations or shared enthusiasm are potent challenges to the teacher in term of increased efforts at imparting knowledge. According to Haimowitz (quoted by Mbugua, Kibet, Muthaa and Nkanke, 2012), the cause of most failures in schools might not be due to insufficient or inadequate instruction but by active resistance of learners. Good student's background has also been identified as factor that could promote high achievement in Biology (Araoye, 2012). The location of Owerri Girls S.S. might account for the category of students that enroll in the College. Academic preparation of students and positive peer influences would enhance academic success and that praise and encouragement by teachers and parents is needed to facilitate students school work (Fonseca and Conboy, 2006).

Fonseca and Conboy, (2006) had also opined that parenting practices and parental involvement with the school explain much of the variations in school performance. From this study, parent-based factors were also noted to vary along the pattern of disparity of academic performances with the schools. While the parent-based factors influence on students was rated 78% at Owerri Girls S.S. with highest academic performance rating, the rating at Ikenegbu Girls S.S. was 41.7%. Owerri Girls S.S. could have been first choice for the more privilege parents around this location of the school. According to Conger et al (1999), low parental socio-economic status is associated

with diminished resources hence contributing to low academic achievement. Parental diminished resources will reflect in the inability to provide needed textbooks for the children. Textbooks are major inputs for performance in examination (Psacharaporous, 1985).

Conclusion: While the schools that were under this study were all public schools under the same government funding and administration, the academic performances in Biology at the commonly undertaken WASC examination in the schools were different. The ratings of teacher-factor, school-factor, student-factor and parent-factor were identified to reflect the pattern of disparity of the academic performances at these different schools. This investigation revealed that the structures put in place and pattern of administration in the different schools were different and hence affected the performances of the students.

Recommendations: The different secondary schools in the state are put in place for the education of the youths and without a deliberate intention to favour a section of the community above the other. It is based on this that the following recommendations are made:

1. Government should post teachers to the schools on the basis of common teacher/students ratio since population of students vary from one school to the other.
2. For the government to realize the objectives of the huge investment in education of the youth, the needed structures, good laboratories with equipment and library should be put in place at the various institutions of learning.
3. The Biology teachers should be guided and assisted to adequately match theory teaching with practical classes for effective learning and teaching of Biology.
4. For the welfare of the students and assisting their effective learning, school health clinic should be put in place and equipped and properly staffed.

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