

## **Prediction of Academic Performances in Biology Among Public Senior Secondary School Students in Kwara state, Nigeria**

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### **Abstract**

This research work examined the predictors of academic performance in biology among public secondary school students in Kwara State, Nigeria. Four objectives were raised and four hypotheses were tested at 0.05 level of significance. Survey and correlational research design were used in this study. Simple random sampling technique was used to select a sample of 242 biology teachers from 293 secondary school from 16 local government area. Frequency count and percentage were used to test the hypothesis. Quantity and quality of teachers and academic performance questionnaire (QQTAP) and performance on student's academic performance was used for data collection. Pilot study were conducted to test the reliability of QQTAP. The data collected for the study was analysed using statistical package for social science (SPSS, 20). The use of mean, standard deviation and percentages were also employed in describing the nature of the data generally. Chi-square and regression was also used. The findings of the study revealed that there was significant relationship between teachers' qualification, teacher's experience on student academic performance. It was further revealed that there was a strong positive relationship between physical facilities and students' academic performance. There is moderate positive relationship between school libraries and students' academic performance and strong positive relationship between school laboratories and students' academic performance. Based on the findings of this study, the following recommendations were made; adequate supply and effective Utilization of infrastructural facilities (physical facilities, library facilities and laboratory facilities should be provided to impact positive on learning and make learning more permanent. Government at all levels should make provision for in-service to teachers this will help them gain higher qualification.

**Keywords:** Education, Prediction of academic performances, Biology, Public Senior Secondary Schools, Students, Kwara state and Nigeria.

### **1. Introduction**

Education is the systematic development or training of the mind, capabilities or character through instruction. Education varies in its forms, philosophy, contents and methods as there are different societies in the world. In Nigeria, the National Policy on Education is an instrument 'per excellence' for effecting national development (FGN, 2014). It is further added that education shall continue to be highly rated in the national development plans because education is the most important instrument of change and that any fundamental change in the intellectual and social outlook of any society has to be preceded by educational revolution (FGN, 2014).

Secondary education is the education children receive after primary education and before the tertiary education. The broad goals of secondary education shall be to prepare the individual for

useful living within the society and higher education (FGN, 2014). It is an investment as well as an instrument that can be used to achieve a more rapid economic, social, political, technological, scientific and cultural development in the country. It is in this wise that there seems to be a lot of controversies and concern all over the world as to the view that the standard of education is falling. One of the most amenable tools for measuring such standard has been students' performance in external examinations.

At the senior secondary level science is departmentalized into Biology, Chemistry and Physics. Biology which is the study of different forms, their evolution, structures, functions, growth, distribution and taxonomy occupies a unique position in the secondary school science curriculum. It serves as a pre-requisite to the study of other lucrative and challenging professions like; Medicine, Nursing, Pharmacy, Pharmacology, Biochemistry, Agriculture, Microbiology, Geology, Geography, Technological and other applied sciences. The vital role of the study of this discipline in the economic, industrial and public life of the learners and the general humanity cannot be overstressed (Ibe and Ukpai 2013; Akanbi and Kolawole, 2014).

In recent times, observations on students academic performance in science generally, and Biology, in particular over the years in the results of Senior Secondary Certificate Examination (SSCE) conducted by West African Examination Council (WAEC) revealed that a very few number of students perform better in Biology examination compared with other subjects (Skaalvik , 2005). Parents and government are in total agreement that their huge investment on education is not yielding the desired dividend and that despite their huge investment on education, students' performances still remain poor. Teachers also complain of students' low performance at both internal and external examinations. Result of WASSCE examinations revealed that in 2010/2011, 2011/2012 and 2012/2013 respectively only 49%, 38.5% and 35.66% of the candidates that sat for the examinations scored A<sub>1</sub>-C<sub>6</sub> in Biology for the years mentioned. The situation was worse in 2009/2010 where only 28.59% of the total population recorded A<sub>1</sub>- C<sub>6</sub> in Biology (Ministry of Education, Kwara State). This study is to investigate infrastructural facilities, instructional materials, teachers' qualification, teachers' experience and gender of the students as predictors of public senior secondary school students' academic performance in Biology in Kwara state, Nigeria.

Library is one of the infrastructural facilities; it is an essential factor in teaching-learning process. It forms one of the most important educational services. The chief purpose of a school library is to make available to the student, at his easy convenience, all books, periodicals and other reproduced materials which are of interest and value to him but which are not provided or assigned to him as basic or supplementary textbooks. The importance of library has been demonstrated by the government when she expressed in the National Policy on Education (FGN, 2014) that every State Ministry needs to provide funds for the establishment of libraries in all her educational institutions and to train librarians and library assistants.

In a related study, Waldman (2003) discovered that students visit library for different purpose. This purpose therefore will have strong influence on their performance. In one of his research questions that what did they do at library? 80% reported studying, 38% to do research, 33% to sleep, 30% to socialize, 24% to use the library's electronic resources, 22% to check the books out and 21% to e-mail or chat. He concluded that, even though some of these areas overlap (research and use of electronic resources, for example) and students could pick more than an option, it is clear that these students are mostly using the library as a place, not to make use of the library resources or services.

Another important infrastructural facility is the laboratory. Laboratory is essential to the teaching of sciences and the success of any science course is much depends on the laboratory provision made for it. On the need for practical work, Aramide (2009) stated that practical work is a matter of maximum importance in the learning of biology or any other natural science. Students, according to him should not be made to learn by heart that which has been explained to them by the teachers only. In his opinion, a common error observed in biology teaching in schools is that teachers do not include enough practical works in their teaching scheme. According to him, schools do not teach practical biology until second or third term of senior secondary III. The teacher being conscious of the fact that the students will face a practical biology in the secondary school certificate examination begins to give hasty lectures on how to attempt that examination, he added.

Lawal (2013), pointed out that utilization of laboratory equipment enable learners to focus their attention to important issues and acquire practical skills. In effect, acquisition of such skills is capable of helping students combat unemployment and poverty. Hence, the need for maximum use of such equipment cannot be overemphasized. Olufunke (2012) found in her study that schools with highest frequency of utilization of these equipment had highest mean score followed by schools with average and low frequency of utilization respectively.

Teachers have been shown to have an important influence on students' academic performance and they also play a crucial role in educational attainment because the teacher is ultimately responsible for translating policy into action and principles based on practice during interaction with the students (Afe 2001). Both teaching and learning depends on teachers: no wonder an effective teacher has been conceptualized as one who produces desired results in the course of his duty as a teacher (Uchefuna 2001). Supporting this Adesina (2013) writes that academic performance of students is greatly enhanced when teachers put in their best and requirements into teaching and learning process.

Teachers variable are also noted to have effect on students' academic performances. These include, teachers' knowledge of subject matter, teaching skills, attitude in the classroom, teachers' qualification and teaching experience. These are very crucial because of a significant growing rate of failure and subsequent drop-out in the Nigeria higher institutions, so it is happening in the Nigeria secondary schools. The growing failure rate could essentially be noticed in the yearly decline in students' performance in the Senior School Certificate Examination (SSCE). Thus, is making many students to abandon schooling at the end of senior secondary school years. Thus the need to investigate if teachers in the secondary schools possesses the necessary professional qualification and experience (such as skills, techniques, temperament.) that is required to communicate concepts, ideas, principles, in a way that would facilitate effective learning in Nigeria secondary schools.

The National Policy on Education states, "No Education system can rise above the quality of teachers in the system" (FGN 2014).

## **2. Statement of the Problem**

The researcher as a teacher has observed over the years that there had been worrisome decline in the percentage of public senior secondary school students passing biology as a subject in external examination and a sharp rise in percentage of failure recorded. This problem is clearly seen in the performance of public senior secondary school students from the results of WASSCE in 2010/11, 2011/12 and 2012/13 respectively where 1300418, 1505199 and 1646150 kwara state students sat for WASSCE examination in biology and 645633 (49.65%) 579432 (38.50%) and

587044 (35.66%) out of the total population recorded A1 – C5 for the years above (Kwara State Ministry of Education).

#### Purpose of the study

Not much effort was made to look at combined effects of predictor on academic performance of public senior secondary school students in Kwara State, Nigeria. This study aims at investigating the combined effects of infrastructural facilities, teacher's qualification and teacher's experience on academic performance in Biology in public senior secondary school students in Kwara State.

Objectives of the study are to determine:

- (i) The relationship between infrastructural facilities and academic performance in Biology among Public Senior Secondary School Students in Kwara State.
- (ii) The relationship between teacher's qualification and academic performance in Biology among Public Senior Secondary School Students in Kwara State.
- (iii) The relationship between teacher's experience and academic performance in Biology among Public Senior Secondary School Students in Kwara State.
- (iv) The extent to which infrastructural facilities, teacher's qualification and teacher's experience best predicts student's academic performance in Biology among Public Senior Secondary School Students in Kwara State.

### **3. Hypotheses**

Ho<sub>1</sub> There is no significant relationship between infrastructural facilities and academic performance in Biology among Public Senior Secondary Schools in Kwara State.

Ho<sub>2</sub> There is no significant relationship between teachers' qualification and academic performance in Biology among public senior secondary school students in Kwara State.

Ho<sub>3</sub> There is no significant relationship between teachers' experience and academic performance in Biology among public senior secondary school students in Kwara State.

Ho<sub>4</sub> There is no significant relationship between extent to which infrastructural facilities, instructional materials, teacher's qualification and teacher experience best predicts academic performance in Biology among Public Senior Secondary Schools in Kwara State.

### **4. Theoretical Framework**

This research will employ the General System Theory as the theoretical framework for this study. The General System Theory was originally developed by Ludwig Von Bertalanffy in 1940, he postulated that parts of a system do not work in isolation, they work within a system. Bertalanffy, 1972 defines a system as a "set of elements standing in interrelation". Systems can either be closed or opened. All schools are open systems, though the degree of interaction within the environment may vary. The school is a system with the following components; environment, inputs, processes, outputs and feedbacks. The open system is that of a system that receives inputs from the environment and releases the output to the environment. Any change in the environment can profoundly impact on the open system. Parts of the system interact together for the school system to succeed, or help to locate the source of the problem and as a result find the solution.

#### **Infrastructural Facilities and Academic Performance**

There are a number of studies that have been conducted to identify the type of relationship that exists between infrastructural facilities and academic performance of students.

Olayemi (2009) carried out a study on school facilities as predicting student's performance in Senior Secondary School Certificate Examination in Kwara State. The study population comprised all the 258 secondary schools in the state. Out of this population, samples of 208 schools

were selected through the stratified random sampling technique. Data were collected through an inventory and analyzed with the use of T-test, correlation analysis and multiple regressions. The findings revealed that school facilities were a good predictor of academic performance of secondary school students, since the performance level was generally low.

Alimi (2012) investigated the influence of school types and facilities on students' academic performance as related in private and public secondary schools respectively. Descriptive survey design was used. Proportionate random sampling technique was used to select 50 secondary schools in Ondo State. Two set of research instruments named School Facility Descriptive Questionnaire (SFDAPQ) for principals; and School Descriptive Questionnaire (SFDQ) for the teachers were used for the study. T-test was used to analyze the data. All hypotheses were tested at a significant level of 0.05. The study revealed a significant difference in facilities available in public and private schools in Ondo State. It however revealed no significant difference in academic performance of students in the two types of secondary schools.

Philomena (2016) examined the use of library and students' academic achievement at University of Lagos, Nigeria. The study was a descriptive research survey. A total of 120 students were randomly selected for the study. Two hypotheses were formulated and tested at 0.05 level of significant. The findings showed that there exist a significant association between library use and students' academic achievement. Besides, the study revealed a significant association between counselling and students' use of school Library.

Ihejiamaizu and Ochui (2016) focused on Utilization of biology laboratory equipment and students' academic performance in senior secondary schools in Cross River State, Nigeria. One null hypothesis was formulated. Ex-post facto research design was adopted and a sample of four hundred and ninety (490) biology students was used for the study. Checklist on utilization of biology laboratory equipment and Bio achievement Test were the instruments used for data collection. To test the hypothesis, one way Analysis of Variance (ANOVA) was employed. The hypothesis was subjected to testing at 0.05 level of significance. The result of the analysis revealed that utilization of Biology laboratory equipment significantly influenced students' academic performance in Biology.

Emmanuel and Samuel (2016) examined the effect of frequency of practical work on achievement of senior secondary two (SS2) students in Biology. A sample of 228 SS2 Students from three government-approved schools in Konshisha Local Government Area of Benue State Nigeria was used. Biology Achievement Test (BAT) with reliability coefficients of 0.89 was used to collect data from students in Biology. Mean and standard deviations were used to answer research questions while analysis of covariance was used to test the hypotheses at 0.05 level of significance. ANCOVA with the P-value of less than 0.05 for achievement ( $F_{2, 221} = 240.521, p < 0.05$ ) among the harmonized, intermediate and the control groups showed that there was significant difference in achievement. No significant difference was observed between boys and girls in the intermediate ( $F_{1, 278} = 0.015, p > 0.05$ ) and the harmonized ( $F_{1, 65} = 3.248, p > 0.05$ ) groups.

Bola, (2014) investigated the influence of laboratory facilities on student attitudes to science learning. He randomly selected 100 Biology students, (48 males and 52 females) from Government Day Secondary School Aboto-oja Ilorin, Kwara State. Using an instrument with reliability of 0.72, the T-test statistical tool revealed that there was no significant difference between the availability of laboratory facilities and attitudes of students to learning of science. He also suggested that availability of adequate laboratory and equipment will enable students to: perceive and observe his environment; collect data and process such data collected by critical analysis; draw or make inference from data obtained; develop self confidence; and be dogmatic but concept all facts tentatively.



### **Teacher's Qualification, Teacher's Experience and Academic Performance**

Abe and Adu (2013) and Wiki (2013) opined that a teaching qualification or teacher's qualification is one of a number of academic and professional degrees that enables a person as a registered teacher in primary or secondary school.

For instance Abe and Ado (2013) reported a positive significant relationship between teachers' variables such as area of specialization, gender, educational qualification and the learning outcomes of secondary school students. Adodo and Oyeniyi (2013) reported that teachers' qualification contributed marginally to students' academic achievement. Although Wiki (2013) noted a positive relationship between teachers' qualifications and students' academic achievement, Edu, Edu and Kalu (2012) reported that the inadequate qualification of teachers contributed to students' repetition of a class. High teacher experience was cited by Odumbe, Simatwa and Ayodo (2015) as one of the factors that enhance performance in day secondary schools.

Usman, (2014) in his study examined the effect of teachers' qualification on student's performance in Biology. Three hundred (300) students were randomly selected from ten (10) schools that were purposively selected from sixteen (16) secondary schools in Ilorin Local Government Area of Kwara State and used as sampled for the study. The qualification of the teachers was used as the criteria for selection of Biology teachers. The three hypotheses in the study were tested using t-test statistic. The results showed that significant differences existed in the performances of students taught by professional teachers and non professional teachers, between students taught by NCE teachers and B.Sc.Ed. teachers and also between B.Sc. teachers and B.Sc.Ed.

Mohammed (2012) investigated the extent to which teacher's qualification and subject matter could predict student's achievement in Biology among senior secondary school students in Maiduguri Metropolitan Council of Borno State. The study adopted a descriptive research design of survey type to provide answers to four research questions. The study covered 20 secondary schools randomly sampled. In each of the schools a total number of fifty (50) senior secondary II students were selected to participate in the study making a total of one thousand (1000) SS II students in all. All the SS II Biology teachers in the selected schools also participated in the study. Subject Mastery ( $r = 0.74$ ) questionnaire and Biology achievement test ( $r = .072$ ) were used in data collection. Data collected were analyzed using frequency counts and simple percentage. Multiple regression analysis was also used for data analysis. The findings of these study showed that teachers teaching qualification has a significant relative contribution to student's academic achievement in Biology.

## **5. METHODOLOGY**

### **Research Design**

This current study used survey and correlational design. Survey design is a system for collecting information from or about people to describe, compare or explain their knowledge, attitudes and behavior. We surveyed the study of infrastructural facilities, teacher's qualification and teacher's experience, gender of the students and academic performance of public senior secondary school students.

### **Population and Sample**

The population for this study consisted of all the teachers in Public Senior Secondary Schools teaching Biology and all Biology students in Public Senior Secondary School three (SSS III) male and female who graduated from 2010/2011 to 2012/2013 in all the Local Government

Areas in Kwara State. There are three senatorial districts consisting of sixteen (16) Local Government Areas with 293 Public Senior Secondary Schools in all with a total of 649 Biology teachers. To determine the sample size needed to represent the number of public senior secondary schools, Krejci and Morgan, 1970 table for determining sample size was used for selection of sample size. Based on the table by Krejci and Morgan, 1970, in a 293 public senior secondary schools, a sample size of 165 public senior secondary schools were sampled. Table by Krejci and Morgan, 1970, 649 Biology teachers, 242 Biology teachers were sampled through the use of stratified random sampling technique which ensures that the various characteristics of a population are well represented in the sample.

### **Research Instruments**

The researcher used the following instruments to elicit the relevant data:

1. Questionnaire for Teachers
2. WAEC results (student's score): 2010/2011 to 2012/2013
3. Check list (infrastructural facilities).
4. Proforma.

The questionnaire for the Biology teachers was designed by the researcher with the help of the supervisors. Suggestion given by the supervisors was adopted and incorporated in to the instrument to elicit information on the demographic information of the teachers and those seeking information on infrastructural facilities (physical facilities, library facilities and laboratory and other variable responsible for academic performance of students). The questionnaire was based on three likert scale of responses as follows: Adequately available (AA), Inadequately available (IA) and Not available (NA). The respondents ticked the options that appeal to them most. Thirty two (32) items were presented. Thirty one (31) of the questions were close and reflected facilities that were believed to affect students' performance in Biology and the Thirty second (32<sup>nd</sup>) item was open ended question. It invited teachers to make comments about other variables which they thought affected performance in Biology. The questionnaire was titled 'Quantity and quality of teachers and academic performance' (QQTAP). It contained three sections. Section A will contained items on demographic information such as name of school, number of qualified teachers, teacher's qualification and years of experience. Section B elicited responses on availability of Physical facilities, Section C elicited responses on library facilities and Section D elicited responses on laboratory facilities and other variables that assisted in teaching of biology which are not provided adequately in the schools. Information were collected from the past WASSCE records on student's academic performance from 2010/2011 to 2012/2013 using Proforma. Other relevant data such as students' enrolment and each year's percentage result were also obtained. Data from WASSCE were used to validate records from the schools and the Ministry of Education. A well validated instrument titled Utilization of biology laboratory equipment check list (UBLEC) was used. Check list was adopted from West African Examination Council (WAEC) minimum standard for the establishment of Secondary School Biology Laboratory with four options.

### **Procedure for Data Collection**

The researcher collected an introductory letter from the Head of Department of Education, University of Maiduguri, which formerly introduce the researcher to the Director, WAEC. The researcher used the profoma with the help of two research assistants to record the grade of the students in WASSCE Biology in each of the public senior secondary schools selected from 2010/2011 - 2012/2013. Permission for conducting the study was sought from the selected Public Senior Secondary Schools in Kwara state. The researcher personally administered the questionnaire

to the Biology teachers. Enough time was given to the respondents to complete and return the questionnaire. The researcher collected the relevant school records and obtain information on infrastructural facilities available in the schools to be sampled. The researcher visited some schools especially those within the selected schools in each local government area to administer the checklist while other schools in the rest local government areas were administered with the help of trained research assistants. All the items on the check list in biology were checked personally to ascertain their availability, adequacy and quality. The sets of data collected and information from records were assembled and subjected to a statistical analysis.

### Method of Data Analysis

The data analysis was achieved using Statistical Package for Social Sciences (SPSS, 20). The use of Mean, Standard deviation and Percentages were employed in describing the nature of the data generally. Hypothesis one was tested using Chi-square while hypothesis 2-5 were tested using regression analysis.

## 6. Study findings and discussion

**Table 1: Frequency Distribution on Teachers' Qualification**

Teachers' qualification	Frequency	Percentage
NCE/ND	91	37.1
BA/B.Sc./B. Ed	123	50.2
PGDE	14	5.7
M.A/M.Sc./M.Ed.	16	6.5
Ph. D	1	0.4
<b>TOTAL</b>	<b>245</b>	<b>100</b>

**Field Survey, 2018**

Result from table 1 shows that majority of the respondents are degree holders.

**Table 2: Summary of the Frequency and Percentages of the Respondents based on their Years of Working Experience**

Teachers' Working Experience	Frequency	Percentage
Less than 3 years	42	17.1
3-5 years	81	33.1
6-9 years	57	23.3
10 years and above	65	26.5
<b>TOTAL</b>	<b>245</b>	<b>100</b>

**Source: Field survey, 2018**

Result from table 2 shows the teaching experience of the Biology Teachers and majority of the respondents have 3-5 years of teaching experience.



**Table 3: Summary of the one-way analysis of variance on students' academic performance based on teachers' qualification**

Sources of variation	df	Sum of squares	Mean square	F-ratio	p-value
Between groups	3	3826.253	1275.42	2.498	0.020
Within groups	241	123052.768	510.6		
<b>TOTAL</b>	244	126879.020			

Results from table 3 revealed that teachers' qualification has significant influence on students' academic performance.

**Hypothesis one:** teachers' years of working experience has no significant influence on students' academic performance

**Table 4: Summary of the one-way analysis of variance on students' academic performance based on teachers' years of experience**

Sources of variation	df	Sum of squares	Mean square	F-ratio	p-value
Between groups	4	7046.477	1761.619	3.528	0.008
Within groups	240	119832.543	499.302		
<b>TOTAL</b>	244	126879.020			

Results from table 4 revealed that teachers' years of teaching experience has significant impact on students' academic performance.

**Hypothesis two:** There is no significant relationship between physical facilities and students' academic performance

**Table 5: Summary of the Pearson's Product Moment Correlation Coefficient on the relationship between physical facilities and students' academic performance**

Variables	N	R	P-value	Remark
School facilities	245	0.735	0.020	Reject H <sub>03</sub>
Academic performance	245			

Result from table 5 above revealed that there was strong positive relationship between school physical facilities and students' academic performance.

**Hypothesis three:** There is no significant relationship between school libraries and students' academic performance

**Table 6: Summary of the Pearson's Product Moment Correlation Coefficient on the relationship between school libraries and students' academic performance**

Variables	N	R	P-value	Remark
School facilities	245	0.611	0.009	Reject H <sub>04</sub>
Academic performance	245			

The result from table 6 revealed that there was moderate positive relationship between school libraries and students' academic performance

**Hypothesis four:** There is no significant relationship between school laboratories and students' academic performance

**Table 7: Summary of the Pearson's Product Moment Correlation Coefficient on the relationship between school laboratories and students' academic performance**

Variables	N	R	P-value	Remark
School facilities	245	0.92	0.000	Reject H <sub>05</sub>
Academic performance	245			

Result from table 7 above showed that there was strong positive relationship between school laboratories and students' academic performance.

This current study examined predictors of Academic performance in Biology Among Public Senior Secondary Schools Students in Kwara State. Academic performance of students in Biology was correlated with the variables of teachers' qualification and years of working experience, and the following. The present study shows the frequency distribution and percentage of teachers qualification to be significantly related with students' academic performance in Biology in this study. The finding of this study is in conformity with Owolabi and Adebayo (2012) who found that there was relationship between teacher's qualifications on the performance of Senior Secondary School students in Biology. This finding showed that students taught by teachers with higher qualifications performed better than those taught by teacher's with lower qualifications. It was also showed that students performed better in Biology when taught by professional teachers.

The frequency distribution and percentage of teachers qualification was found to be significantly related with students academic performance in Biology in this study the finding of this study is in conformity with Olalaye (2011), Owolabi and Adebayo (2012), Isaac and Florence (2013) Usman 2014, Ekpo and Lea Charles (2015), Lawrence, Enose and Okwach (2016), Yusuf and Yunusa (2016), Ebere Lorreta & Ngozi (2016) they fund that there was relationship between teacher's qualifications on the performance of Senior Secondary School students taught by teachers with higher qualifications performed better than those taught by teachers with lower qualification. It was also showed that students performed better in Biology when taught by professional teachers.

## 7. CONCLUSION AND RECOMMENDATIONS

Based on the findings and within the limit of this study, the following conclusions are drawn;-

- (i) Adequate supply and effective utilization of infrastructural facilities (Physical facilities, library facility and laboratory facility) can impact positively on learning and make learning more permanent on students and teachers.
- (ii) Teachers' qualification and experience, infrastructural facilities are not the sole determinant of students academic performance, students' related factors such as intelligence, parental education, socio-economic status as well as class size and teachers' classroom effectiveness rather than qualification alone may also impact positively on

academic performance of students and may be partly responsible for the observed low performance of students in all the schools investigated in this study and the state in general.

- (iii) The observed low performance of Senior Secondary School Students in Biology may be alleviated by encouraging and emphasizing teacher's effectiveness in terms of allowing only qualified and experienced teachers to handle the subject.

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