

**AN APPRAISAL OF FACTORS INFLUENCING STUDENTS'
ACHIEVEMENT IN BIOLOGY IN SENIOR SECONDARY SCHOOLS
IN OREDO LOCAL GOVERNMENT AREA, EDO STATE**

BY

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**FACULTY OF EDUCATION
UNIVERSITY OF BENIN
BENIN CITY**

JULY, 2021

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**A RESEARCH PROJECT SUMMITTED TO THE DEPARTMENT OF
CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY
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AWARD OF B.SC. (ED)DEGREE IN BIOLOGY**

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CERTIFICATION

We certify that this research work was carried out by ENABULELE OJO SARAH with matriculation number EDU1602269 in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin.

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DEDICATION

This research work is dedicated to the Almighty God for his Grace and enabling strength bestowed on me in completing this programme despite all odds.

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ABSTRACT

The study was carried out to appraise the factors influencing students achievement in biology in senior secondary schools in Oredo Local Government Area of Edo State.

Four (4) research questions were raised for the study and the descriptive survey research design was adopted. A review of some related literature was carried out. The reliability of the student's questionnaire was established at 0.75 using Cronbach Correlation Alpha method. A total of one hundred and twenty (120) secondary school students in Oredo Local Government Area constituted the population study sample. The instrument used for gathering data from the selected sample was a questionnaire; the data collected were analyzed using descriptive statistics in form of percentage and mean.

The study revealed that; the total number of students in class (class-size), the teaching method employed by the teacher in teaching Biology, the availability and utilization of laboratory facilities, attitude of both teachers and students towards the teaching and learning of Biology have influence on students achievement in Biology. Based on the findings, recommendations were made; that the ministry of education and parents should provide the necessary motivation and orientation to teachers and students in order to change their attitude towards teaching and learning of Biology. Biology concepts should be taught with practical activity. Ministry of Education and professional organizations should organize workshops, seminars and conferences for biology teachers on how to utilize the available teaching and learning resources in order to enhance students achievement in Biology. High ratio of students to teacher should be avoided by training and employing more teachers in various schools. Teachers must vary their method of teaching Biology. Teachers must not hold on to only one method of teaching Biology instead should use different methods of teaching that suit the prevailing situation and topics to be taught.

CHAPTER ONE

INTRODUCTION

Background to the study

Education is one of the most important aspects of human resource development. The students performance play an important role in producing best quality graduates who will become great leaders and manpower for the country thus responsible for the country's economic and social development. The Nigeria's philosophy of education is based on the integration of an individual into a sound and effective citizen and equal educational system both inside and outside the formal school which is the best way of helping every nation to cope with complex problems. Education has become one of the most powerful weapons known for reducing poverty and inequality in modern societies. It is also used for laying the foundation for a sustainable growth and development of any nation. The rate at which any country develops can easily be attributed to the level of scientific knowledge posed by its inhabitants and which may be applied to everybody activities. The need for science as a part of general and liberal education at all levels of our educational system has always been advocated.

According to Abdullahi (2008) stating that the federal Government of Nigeria particularly recognizes the importance of science education in our curriculum as a means to equip students to live effectively in our modern age of science and technology. Science education is very important to the growth and development of any Nation and especially Nigeria which is not at present a basic consumer of these inventions. Science has been defined as an organized body of knowledge, a method of solving problems and it also serves as a search of explanation of natural objects and phenomena; (Ayeni, 2002). Also, Abimbola, (2002) stated that science is a bag of knowledge, a way of investigating and experimenting what goes on in the world, and a way of finding solutions to domestic and foreign problems by adopting scientific method as a result of advancement in science and technology.

The acquisition of biological knowledge has come from the work of tens of thousands of curious and devoted students of the subject. Biology as a science subject plays an important role in Agriculture, Medicines, Industries, Health and Physical Sciences; Food and Nutrition including the General Education of which it forms an integral part. Biology is important to man and many of man's

problems today both individual and collective are biology problems which can be stated, defined, studied understood and solved in biological terms. For instance, biological principles are variables in the functioning of the various parts of the body that are applied in Medicine, control of vectors of many diseases are also undertaken in biology. It is a subject introduced to students at senior secondary school level as a preparatory ground for human development, where career abilities are groomed and potentials, talents are discovered (FRN, 2009).

Academic achievement is one of the major factors considered by employers in hiring workers especially for the fresh graduates. Thus, students have to put the greatest effort in their study to obtain good grades and to prepare themselves for future opportunities in their career at the same time to fulfill the employer's demand. Academic performance in the secondary school education determines whether the students will proceed to tertiary level for higher degree. The quantity and quality of science education received by secondary school students are geared towards developing future scientists, technologist and engineers. Because of its importance more students enrolled for Biology in Senior School Certificate Examination (SSCE). Majority of the students offer it at the Senior School Certificate Examinations (SSCE) because the knowledge of Biology is

needed in the fields of medicine, nursing, pharmacy, agriculture, engineering and other related disciplines. Numerous number of attempts to improve scientific knowledge especially in Nigeria and the performance of students in senior secondary schools, especially in Biology is poor.

The performance of students in senior secondary school examination (SSCE) in Biology is appalling. This has been proven to true by the chief examiner' report of West African Examination Council for the year 2011 the total percentage of all the grades awarded was 97.17% of which only 31.29% fell under (A1 – C6). In the year 2013, total percentage of all the grades awarded was 99.41% of which only 38.75% fell under grade (A1 – C6). In the year 2015, the total percentage of all the grade awarded was 97.63% of which only 31.81% of the grades fell under grade (A1 – C6) (Adeyemi, 2018).

Academic performance has been described as the scholastic standing of student at a given moment. It could be viewed in terms of grades/scores obtained in a test (Sage, 2014). The academic performance of most Biology students have been below standard and the factors that contribute to poor performance of students in Biology according to Doriah (2013) are unavailability of textbooks,

laboratory apparatus and other learning resources. Lessa (2013); Korau (2003); Sega (2009) blamed the ineffective teaching of Biology, lack of interest on the part of the student, large class size and over population of classrooms, parental factors and lack of infrastructure.

Statement of the Problem

Despite its significant contribution in our educational system and the efforts made by researchers to improve it, secondary school students' poor performance in Biology is causing serious concern in Nigeria's educational circles. Furthermore, the poor teaching and learning of biology in our secondary schools has raised a lot of awareness and concern in recent years. Biology teachers in secondary schools face difficulties in their teaching and learning of the subject.

It is imperative to adjust students way of life in a more social and economic order through establishing better-targeted education system. In this regard, focusing on improving the academic performance of students is the most crucial and important investment. In fact, there is a bottleneck that constrains students from performing well at school while several studies have been conducted to unravel factors affecting the academic achievement of students. Derebssa (2006)

revealed that the tradition of teaching and learning process which leads the students to have less preference to actively participate in learning. This is due to lack of prior experience of teaching method, poor relationship between teachers and students, teachers' lack of expertise, lack of teaching material or inappropriate curricular materials. Is it even biology teachers' teaching practices, students' attitudes toward biology teaching and learning, an insufficient biology laboratory, insufficient use of instructional materials in biology teaching, class size, or instructor non-professionalism? The aforementioned issues inspired the researcher to perform research in the hopes of finding the root causes of the issues.

Expanding access to quality education is another pressure of poor academic achievement (Ayalew, 2005). But still statistics shows that majority of students scored very poor result in senior secondary examinations, because of this, students' loss their motivation to continue learning, the reason could be due to some problems rather than quality of education and teaching and learning processes.

The study hence, attempt to appraise the factors inhibiting student achievement in Biology in senior secondary school in Oredo Local Government Area of Edo State.

Research Questions

For the purpose of this research work the following research questions have been formulated to guide the study:

1. Does class size influence students' achievement in Biology?
2. Does the method of teaching adopted by Biology teachers influence students' achievement in Biology?
3. Does the availability and utilization of laboratory facilities influence students academic performance in Biology?
4. Does the attitude of teachers and students influence students academic performance in Biology?

Purpose of the Study

The purpose of this study is to appraise the factors inhibiting student's performance in Biology as a science subject in senior secondary schools in Oredo Local Government Area of Edo State. Specifically, the study will;

- Investigate the influence of class-size on students academic achievement.
- Investigate the influence of teaching methods on students academic achievement.
- Investigate the influence of the availability and utilization of laboratory facilities on students achievement in Biology.
- Investigate the influence of teachers and students attitudes on students academic achievement in Biology.

Significance of the Study

Due to Nigeria's economic downturn over the years, which has resulted in a high cost of living in the country, educational costs are not exempt, and as a result, the government and parents are cutting back on their spending. However, failure rates are still on the rise, not only in Biology but in other science subjects as well, so this research is significant for the following reasons:

- It will elevate teachers', curriculum designers', and education policymakers' understanding of the factors that lead to failure in Biology and how to prevent it.

- It will teach parents the value of investing in their children's education because it will lead to improved academic success and, in turn, less wasteful spending due to failure.
- It will allow the government to understand why laboratories, teaching materials, and a conducive teaching and learning atmosphere are important because they influence student success.

Scope and Delimitation

This research focuses on the appraisal of the factors that inhibit student achievement in Biology in senior secondary schools in Oredo Local Government Area.

This study considered only few of the numerous factor affecting the students achievement in Biology. The study is therefore restricted to public senior secondary schools in Oredo Local Government Area of Edo State.

Definition of Terms

Attitude: This is a disposition and pre-deposition towards individual.

Biology: This is the branch of natural science concerned with the study of life, living organisms (plant and animals) including their structures, functions, growth, evolution and taxonomy.

Factor: Any element, condition that influences student performance.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviewed related literature concerning the appraisal of the factors that inhibit students achievement in Biology in senior secondary schools in Oredo local government area, the researcher reviews some of the related literature on the following sub-headings:

- Concept of Biology
- Class-size and students academic performance.
- Teacher's method of teaching and student's performance
- The availability and utilization of laboratory facilities on students performance in Biology.
- Teachers and students attitudes on students academic performance in Biology.
- Parental socioeconomic status
- Summary of Literature Reviewed

Concept of Biology

Biology is a branch of science that deals with the study of living organisms. It is primarily concerned with the nature of organisms and their relationship to each

other and to their environment. Biology as a subject endeavors to enable one understand himself/herself, understand major biological processes that take place within himself/herself for example digestion, respiration, circulation, excretion and gaseous exchange. Appreciate the effect of these biological processes and the larger environment as a whole. Biology like other science subjects is a practical oriented discipline which seeks to develop in a learner, scientific inquiry and problem solving skills.

The overall purpose of teaching biology is to provide students with the fundamental knowledge, skills, and attitudes necessary to live an independent and valuable life, both for themselves and for the greater community in which they live. The Biology course is designed to meet the demands of students who want to pursue studies in biology and related fields. As proven in Medicine, Agriculture, and Industry, biological knowledge may be applied in many fields to improve man's well-being. (Okwo and Tartiyus, 2014). Considering its characteristics and importance, Biology is a standard subject of instruction at all levels of our educational system, from primary to tertiary levels. It is one of the core subjects at Secondary School Certificate Examination (SSCE) whose study is very relevant to man's successful living (Akindele, 2009).

Araoye (2009) opined that, exposure to Biology education offers the learners a wide range of relevance to all aspects of life. Biology is quite popular at all levels of Nigerian education. It also has a large students' enrolment than any other science subject especially at the tertiary levels of the Nigerian education (Ofoegbu, 2013).

Class-size and Students Academic Performance.

Class size is a term used in education to define the average number of students in each class of a school. The All Nigerian Conference of Principals of Secondary Schools (ANCOPSS) advised a maximum of forty students per class for efficient and effective teaching, emphasizing the importance of class size to the learning teaching process. When it comes to teaching, learning, and student academic performance, class size is critical. Researchers and educational scholars agree that when class sizes grow larger, students' achievement drops. The effect of class size on cognitive achievement has been debated and researched on for many years, this has been inconclusive.

Adeyemi (2008) in his findings on the influence of class size on the quality of output in secondary schools revealed that schools having an average class size of 35 and below obtained better results in the secondary school certificate

examination (SSCE) than schools having more than 35 students per class. Oguntoye (2011) in his own study found that class size had negative coefficient with student's academic performance in examination.

In his research on the impact of class size on the quality of output in secondary schools, Adeyemi (2008) discovered that schools with an average class size of 35 or less students per class performed better on the secondary school certificate examination (SSCE) than schools with more than 35 students per class. In his own research, Oguntoye (2011) discovered that class size had a negative correlation with students' academic achievement in examinations.

Earthman (2012) discovered that a comfortable classroom temperature and smaller classrooms improve teachers' performance and allow students to receive more individual attention, ask more questions, fully participate in discussions, have fewer discipline issues, and do better than students in bigger courses. According to Fafunwa (2010), there is a disparity in the quality of students in overcrowded classrooms with insufficient and obsolete equipment, as well as disillusioned staff. The student's academic achievement may have been harmed as a result of these combined inadequacies.

In her research, Adeyela (2017) discovered that big class sizes are not conducive to serious academic work. Similarly, Egede (2015) stated that in secondary schools, an alarming class size of 100 or more kids leaves the teacher overworked and unable to exercise patience and a positive attitude. They are also hesitant to provide more time to help and build the intellectually disabled students. Olagunju (2015) discovered that class size was inversely associated to school academic achievement in one of his primary findings.

“If classes are quite large, it is crucial that, as far as feasible, the learners are continually busy and the tasks function continually without recurrent intervention from the teacher,” Coleman (2012) advised passionate teachers. Finance, class size, teacher quality, length of school year, and technology were all elements addressed by Brooker and Rouse (2011) as determinants that can improve students' academic achievements. They suggested that when it comes to public schools, money is key, and that smaller class sizes lead to higher results. Yara (2010) in his study on class size and academic achievement of student found, out that the performance of students in large classes was very low (23%) compared to those students in smaller classes (64%).

Teachers' Method of Teaching and Students' Performances

Depending on the material, many methods and strategies might be utilized in biology instruction. Laboratory methods are the most commonly used approach for permanent learning because they encourage mental activity and allow students to work individually or in groups (Reid, 2016). Using laboratory approaches, students learn how to apply what they've learned rather than memorizing it. Students enhance their ability to comprehend concepts and apply them to daily life as well as personal abilities, while also developing a positive attitude toward Biology classes (Normah & Salleh, 2017). Activities must be planned, organized and implemented so that students may develop more positive attitudes. Biology lessons being held in the classroom on the sole theoretical basis is one of the factors that influence attitude of the students toward these lessons in a negative manner (Olusola & Rotimi, 2012).

Biology topics comprising abstract concepts, according to Rivard and Straw (2016), should be addressed in the students' daily lives, together with simulations, animations, and other media to keep the students' attention alive. According to Normah and Salleh (2017), learning through discovery is preferable to passive listening, and students should be taught how to connect

physical concepts to their everyday lives. Instead of expanding the number of hours spent in Biology labs, more hands-on scientific activities that can be done quickly and effectively using inexpensive supplies should be developed. Studio Biology which is a method of teaching that provides an integrated learning environment with hands-on lab measurements coupled with active student problem-solving should be apply in the Biology lessons.

Biology instructors should like their profession and reflect this to others. Such manners of instructors will improve the attitude of students towards Biology lessons and physical experiments. However, it should be researched whether teachers' training, teaching methods, students' families towards on Biology lessons (Gok & Silay 2018).

Teacher's strategy itself was considered as an important factor. This implies that the mastery of Biology concepts might not be fully achieved without the use of instructional materials. Oladejo, M. Olosunde, Ojebisi & Isola (2011) stressed that a professionally qualified science teachers no matter how well trained, would unable to put his ideas into practice if the school setting lacks the equipment and materials necessary for him or her to translate his competence

into reality. A situation that is further compounded by the galloping inflation in the country and many at times, some of the imported sophisticated materials and equipment are found expensive and irrelevant; hence the need to produce materials locally. (Mattern and Schau (2014) stated that science is resource intensive, and in a period of economic recession, it may be very difficult to find some of the electronic gadgets and equipment for the teaching of Biology in schools adequately.

The effects of teachers' experience are considered to be a factor affecting students' attitudes towards their perception in Biology. Gok and Silay (2018) indicates that teachers get better at teaching during the first few years and then probably decline afterwards. Thus, teacher's age and experience in teaching affect how he teaches and therefore also students' attitudes toward the course and students' achievements in the course. Many researchers believed that if students were allowed to demonstrate higher cognitive abilities through problem solving, either through a teacher centered approach or a student-centered approach, their attitudes towards Biology might be positively affected (Erdemir and Bakirci 2009).

Akiri and Nkechi (2009) are of the opinion that ineffectiveness of teachers in classroom interaction with the learners could be responsible for the observed poor performance of learners and the widely acclaimed fallen standard of education. Poor academic performance of learners can be linked to poor teachers' performance in terms of accomplishing the teaching task, negative attitude to work and poor teaching habits which have attributed to poor motivation (Akiri & Nkechi 2009). However, in most schools in Lesotho, ineffective teaching is due to conditions such as lack of resources facilitating teaching and learning that resulted into negative influence on the instructional quality in schools, translated into poor academic performance, attitude and values. The way learners learn affect their academic performance. Most learners perform below average due to lack of motivation. They are neither motivated to learn nor do they do what they are expected to do. Several researchers have suggested that only motivation directly effects academic achievement; all factors affect achievement only through the effect of motivation (Tucker, Zyco & Herman, 2017). However, it is not easy to understand what motivates learners. Numerous studies have been conducted on this topic, which has led to the development of several theories of motivation.

The Availability and Utilization of Laboratory Facilities on Students Performance in Biology.

The science laboratory, according to Hofstein, Nahum, and Shore (2001), is a unique learning environment in which students can work cooperatively in small groups to investigate scientific phenomena. When contrasted to a traditional classroom setting, the laboratory environment is supposed to be less formal, allowing for interactions between students and the teacher. Such greater interactions are likely to promote more positive social interactions that are ideal for creating a constructive and positive learning environment. Laboratory work is an indispensable part of science instruction, and no effective science education can exist without practical work (Udo, 2010).

Laboratory practicals are determined by the degree to which the laboratory is equipped with suitable instructional resources and the teacher's ability to use them effectively and efficiently. The level of utilization and adequacy of laboratory facilities for science instruction are determined by the student population in a given school. According to Ihuarulam (2008), adequate laboratory facilities make Biology education more concrete and exciting, resulting in improved secondary school academic achievement. Academic

performance is a measure of a person's educational attainment. It differentiates one with high knowledge content from the other with low and less competency in academic performance. Okafor (2000) found that the adequacy of laboratory facilities had a significant effect on the students' academic performance in Biology.

Aburime (2004) investigated the influence of adequacy of laboratory facilities and academic performance in Biology and found that adequacy and utilization had significant influence on students' academic performance in secondary school Biology teaching. Ensaf (2013) emphasized that the laboratory plays a major role in realizing the intellectual, emotional and the psychomotor objectives of science teaching, teacher in general, and the science teachers, in particular, have been given more significance since 1987 when the First Educational Development Convention was held in Amman. The convention emphasized the role of the laboratory in the teaching process and investigated the causes of teacher's unwillingness to use the empirical methodology in science teaching. It has become clear that the leading reason for this abstention is the teacher's unawareness of the significance of the scientific function of the

laboratory and its role in knowledge development and problem solving. The convention emphasized the necessity of boosting the school laboratory role in the educational process. As a result, the syllabus has been enriched with laboratory activities entailing the implementation of the empirical methodology in the educational process.

Teachers, according to Yung (2011), should be aware of the possibilities of assessing their students in order to improve teaching and learning. He contend that even as we approach the twenty-first century, teachers continue to assess their students using paper and pencil assessments, ignoring many of the most essential aspects of students' success in science labs. Despite this, researchers have discovered a shortage of laboratories in Nigerian schools (Alebiosu, 2014).

They said that many schools lacked the necessary laboratory equipment. As a result, students frequently fail to develop science laboratory abilities because their teachers are unable to run practicals which has always had unavoidable consequences for students' learning (Onipede, 2013). These laboratory experiences could have a significant impact on the quality of school experience. All of this demonstrates the value placed on science laboratories in schools.

This significance inspired the researcher to investigate the number of scientific laboratories in Edo State secondary schools, as well as their impact on the quality of output in terms of student achievement in the Senior Secondary Certificate (SSC) examinations.

It implies that schools without laboratories, where students can carry out Biology, practicals would end up producing or graduating students who will have no knowledge of science practicals required by the West African Examination Council (WAEC) and the National Examination Council (NECO), to pass the senior school certificate examination. Consequently, for courses like medicine, engineering, agricultural science and any other science courses. Due to the difficulties of carrying out practicals in under-equipped laboratories, teachers have begun to divide scientific sessions into practical and theoretical sections, or to postpone practical work until the second term of the senior year (Nicharam, 2017). According to Luketic and Dolan (2014), any attempt to divide science into practical and theoretical lessons perpetuates the dichotomy. Because of weak laboratory practicals, the Biology students have been performing below expectations.

Teachers and Students Attitudes on Students Academic Performance in Biology.

If the teaching process is to be efficient, enjoyable, seamless, and result-oriented, the instructor must have some understanding of human nature in general and the individual students in particular. Individual student knowledge is both desirable and important because, despite the numerous references to classroom teaching, such teaching cannot produce high accomplishment without the students (Stephen, 2010).

The teacher must be up to date on current research on student growth in terms of physicality, intelligence, interest, emotions, attitudes (technological), and character qualities, as well as the effects of these characteristics on student progress in Biology. Attitudes are the most accurate indicator of a student's performance (Ogunleye, 2016).

Parental Socioeconomic Status

Above and beyond the other demographic factors, the effects of social economic status are still prevalent at the individual level (Capraro, Capraro, & Wiggins, 2016). The parental social economic status can be deliberated in a number of different ways; it is most often calculated by looking at parental education,

occupation, income, and facilities used by individuals separately or collectively. Parental education and family social economic status level have positive correlations with the student's quality of achievement (Jeynes, 2012; Ma & Klinger, 2018). The students with high level of social economic status perform better than the middle class students and the middle class students perform better than the students with low level of social economic status (Garzon, 2006; Kahlenberg, 2006; Kirkup, 2008).

According to Eamon (2015), a student's achievement is negatively connected with their parents' poor socioeconomic standing since it prevents the individual from accessing learning sources and resources. Low socioeconomic position has a significant impact on student achievement, pulling them down to a lower level (Sander, 2015). At the post-secondary level, this influence is most noticeable (Trusty, 2019). It has also been noticed that economically disadvantaged parents are less able to afford their children's higher education costs, and as a result, they do not work to their full potential (Rouse & Barrow, 2016).

According to Krashen (2005), educated parents are better able to communicate with their children about schoolwork, activities, and material being taught at school. Students with educated parents do better on standardized examinations

than students with uneducated parents. They will be able to better support their children at job and at school (Fantuzzo & Tighe, 2014).

Students' academic success is also influenced by their family environment. Parents who are well-educated can create an environment that is conducive to their children's academic performance. The school officials can give parents with counseling and support to help them create a pleasant home environment that will increase the quality of their children's work (Marzano, 2013). To achieve a greater degree of quality in academic accomplishment, pupils' academic achievement is significantly reliant on parental involvement in their academic pursuits (Barnard, 2014).

Summary of Literature Review

Various researchers view has been identifying factors that inhibit students achievement in Biology which include; inadequate Biology laboratory facilities, teacher and student attitude, use of instructional material, Class size, teaching method and parental socioeconomic status. The literature review is related to the research questions and also expands upon the content and background of the study, to help define and provide empirical basis for subsequent development.

CHAPTER THREE

METHODOLOGY

This chapter describes the method and procedure used by the researcher in conducting the study. It is presented under the following Sub headings;

- Design of the study
- Population of the study
- Sample of the study
- Sample and sampling techniques
- Research instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

Design of the Study

The research design that was used for this study is the survey design. The essence of adopting this research design is to elicit data from a census through questionnaire.

Population of the Study

The population of this study comprise of twelve thousand and fifty nine (12,059) students in the fourteen (14) public senior secondary schools in Oredo

Local Government Area of Edo State The population of single male schools are 4,035. Population for single female schools are 5,456 and the population of mixed schools are 2,568 which make a total of twelve thousand and fifty nine (12,059)

Sample and Sampling Technique

The total number of one hundred and twenty (120) students were sampled, simple random sampling technique was used to select six public schools in Oredo Local Government area and twenty (20) students per school. The researcher carried out the study in the following public schools in Oredo Local Government Area. The secondary schools that were selected for this study and the number of students sampled from each school are set out in Table 1.

The sample procedure is represented in the Table below

No	School code	No of Students
1.	A	20
2	B	20
3.	C	20
4.	D	20
5.	E	20
6.	F	20
	TOTAL	120

Research Instrument

The research instrument used for this study is the questionnaire. The instrument for the study is a questionnaire of 20 items used to elicit information from respondents. The questionnaire was divided into two sections. Section A, covers the demographic background of the respondents while Section B, consisted of items related to the research questions. A four point scoring scale drawn along the modified likert summated rating scale for measurement was adopted.

Sample of the Study

The sample of the study comprises of six (6) public secondary schools randomly selected from the total population of thirteen (14) public secondary schools in Oredo Local Government Area of Edo State.

Validity of the Instrument

The content validity of the instrument was established after an intensive screening by the supervisor and two experts from the Department of Curriculum and Instructional Technology, University of Benin. Their inputs and correction in terms of clarity and appropriateness of language was used to develop the final draft.

Reliability of the Instrument

The reliability of the instrument was ascertained after a pilot study of twenty teachers from outside the population. The data generated was analysed using Cronbach Alpha coefficient to determine the reliability. An Alpha value of 0.75 was obtained which makes the result authentic and reliable for research usage.

Method of Data Collection

The questionnaires were administered by the researcher who visited the schools in person and met with the principals and thereafter introduced herself. The researcher personally administered the questionnaires to the respective schools and respondents who were randomly selected by the researcher. The immediate

collection after the respondents filled the questionnaires enabled the researcher to obtain 100% return of the filled questionnaire, it also helped the researcher to offer assistance to the respondents when the need arose.

Method of data Analysis

The method used for the analysis was simple percentage and mean. To convey information at a glance for easy understanding, the analysis was done in a tabular form.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

Table 2: Influence of class size on students Biology achievement

S/N	ITEMS	AGREE (%)	DISAGREE (%)	MEAN
1	The classroom is conducive for learning	71 (59.1%)	49 (40.9%)	2.51
2	Small number of students in the class influences students learning of Biology	74 (61.7%)	46 (38.3%)	2.62
3	Large number of student in the class influence students level of concentration during the teaching of Biology	92 (76.6%)	28 (23.4%)	3.14
4	Students prefer to learn Biology in a small class more than large class	91 (75.8%)	29 (24.2%)	2.88
5	Students are easily distracted in a large classroom	95 (79.2%)	25 (20.8%)	3.13
	TOTAL	84.6 (70.5%)	35.4 (29.5%)	2.86

In Table 2, item 1 revealed that 71 (59.1%) of the respondents agreed that the classroom is conducive for learning while 49 (40.9%) disagreed. Decision made was accepted since the mean value was 2.51 which is higher than the average mean of 2.5. Item 2 revealed that 74 (61.7%) of the respondents agreed that small number of students in the class influences students learning of Biology while 46 (38.3%) of the respondents disagreed. Decision made was accepted

since the mean value was 2.62 which is higher than the average mean of 2.5. Item 3 revealed that 92 (76.6%) agreed that large number of student in the class influence students level of concentration during the teaching of Biology while 28 (23.4%) of the respondents disagreed. Decision made was accepted since the mean value was 3.14 which is higher than the average mean of 2.5.

Item 4 revealed that 91 (75.8%) of the respondents agreed that students prefer to learn Biology in a small class more than large class while 29 (24.2%) disagreed. Decision made was accepted since the mean value was 2.88 which is higher than the average mean of 2.5. Item 5 revealed that 95 (79.2%) agreed that students are easily distracted in a large classroom while 25 (20.8%) disagreed decision made was accepted since the mean value was 3.13 which is higher than the average mean of 2.5.

In summary, the mean for the total average is 2.86 which is above 2.5. The results questions 1 to 5 gave a positive answers. 84.6% of students accepted that class size influences students academic achievement in Biology while 35.4% of them disagreed. It therefore implies that majority of students agreed that their achievement in Biology is influenced by class size.

Table 3: Influence of Biology teachers method

S/N	ITEMS	AGREE (%)	DISAGREE (%)	MEAN
6	Biology teacher uses variety of method when teaching	91 (75.9%)	29 (24.1%)	3.15
7	Students learn better when the Biology teacher uses practical approach	80 (66.7%)	40 (33.3%)	2.90
8	The teaching method adopted by the Biology teacher influence students in learning Biology	78 (65%)	42 (35%)	2.75
9	The teaching method adopted by Biology teacher makes the subject boring	43 (35.8%)	77 (64.2%)	2.10
10	The Biology teacher's teaching method influence students' performance in class	56 (46.7%)	64 (53.3%)	2.45
	TOTAL	69.6(58%)	50.4(42%)	2.67

Table 3 item 6, revealed that 91 (75.9%) of the respondents agreed that Biology teacher uses variety of method when teaching while 29 (24.1%) disagreed decision made was accepted since the mean value was 3.15 which is higher than the average mean of 2.5. Item 7 revealed that 80 (66.7%) of the respondents agreed that students learn better when the Biology teacher uses practical

approach while 40 (33.3%) of the respondents disagreed. Decision made was accepted since the mean value was 2.90 which is higher than the average mean of 2.5. Item 8 revealed that 78 (65%) of the respondents agreed that the teaching method adopted by the Biology teacher influence students in learning Biology while 42 (35%) of the respondents disagreed. Decision made was accepted since the mean value was 2.75 which is higher than the average mean of 2.5. Item 9 revealed that 43 (35.8%) of respondents agreed that the teaching method adopted by Biology teacher makes the subject boring while 77 (64.2%) disagreed. Decision made was not accepted since the mean value was 2.10 which is lower than the average mean of 2.5. Item 10 revealed that 56 (46.7%) of the respondents agreed the Biology teacher's teaching method influence students' performance in class while 64 (53.3%) disagreed. Decision made was not accepted since the mean value was 2.45 which is higher the average mean of 2.5.

In summary, the mean for the total average was 2.67 which is above 2.5. The results shows that research questions 6, 7 and 8 gave a negative answers and 9 and 10 gave positive answers. Total percentage of 69.6 (58%) of students accepted that the method of teaching adopted by Biology

teachers influence students' achievement in Biology while 50.4(42%) of them disagreed.

Table 4: Availability and utilization of laboratory facilities

S/N	ITEMS	AGREE (%)	DISAGREE (%)	MEAN
11	The school Biology laboratory is well-equipped	40 (33.3%)	80(66.7%)	1.91
12	Students have access to the Biology laboratory during practical classes	31 (25.9)	89 (74.1%)	1.80
13	Biology practical is done regularly in the laboratory in school	25 (20.8%)	95 79.2%)	1.76
14	During practical lessons, Biology laboratory equipment are used	39 (32.5%)	81 (67.5%)	1.96
15	Unavailability of biology laboratory facilities affect teaching of Biology	37 (30.8%)	83 (69.2%)	2.12
	TOTAL	34.4(22.2%)	85.6 (77.8%)	1.91

Table 4, item 11 revealed that 40 (33.3%) of the respondents agreed that the school Biology laboratory is well-equipped while 80(66.7%) of respondents disagreed. Decision made was rejected since the mean value was 1.91 which is lower than the average mean of 2.5. Item 12 revealed that 31 (25.9%) of the respondents agreed students have access to the Biology laboratory during practical classes while 89 (74.1%) disagreed. Decision made was rejected since the mean value was 1.80. Decision made was rejected since the mean value was

lower than the average mean of 2.5. Item 13 revealed that 25 (20.8%) of the respondents agreed that Biology practical is done regularly in the laboratory in school while 95(79.2%) of the respondents disagreed. Decision made was rejected since the mean value was 1.76 since the mean was lower than the average mean of 2.5. Item 14 revealed that 39 (32.5%) of the respondents agreed that during practical lessons, Biology laboratory equipment are used while 81 (67.5%) of the respondents disagreed. Decision made was rejected since the mean value was 1.96 which was lower than the average mean of 2.5. Item 15 revealed that 37 (30.8%) of the respondents agreed that unavailability of biology laboratory facilities affect teaching of Biology while 83 (69.2%) of the respondents disagreed. Decision made was rejected since the mean value was 2.12 which is lower than the average mean of 2.5.

In summary, the mean for the total average was 1.90 which is Lower than 2.5. The results shows that questions 11 to 15 gave negative answers. Total percentage of 34.4% of students accepted that the availability and utilization of laboratory facilities influence students academic achievement in Biology while 85.6% of them disagreed.

Table 5: Influence Students and teachers attitude on students achievement in biology

S/N	ITEMS	AGREE (%)	DISAGREE (%)	MEAN
16	The Biology teacher always teach with teaching aids / instructional materials.	31 (25.9%)	89 (74.1%)	1.95
17	The Biology teacher attend to students even outside the classroom	55 (45.8%)	65 (54.2%)	2.55
18	Apart from note that Biology teachers give in class, students also read Biology text books.	105 (87.5%)	18 (12.5%)	3.40
19	Students revision of Biology lessons taught in class by the teacher influences students performance.	99 (82.5%)	21 (82.5%)	3.00
20	Students enjoy doing Biology assignments	111 (92.5%)	9 (7.5%)	3.30
	TOTAL	79.6(79.6%)	40.4(20.4%)	2.84

Table 5, item 16 revealed that 31 (25.9%) of the respondents agreed that Biology teacher always teach with teaching aids / instructional materials while 89 (74.1%) of the respondents disagreed. Decision made was rejected since the mean value was 1.95 which is lower than the average mean of 2.5. Item 17 revealed that 55 (45.8%) of the respondents agreed that the Biology teacher attend to students even outside the classroom while 65 (54.2%) of the

respondents disagreed. Decision made was accepted since the mean value was 2.55 which is higher than the average mean of 2.5. Item 18 revealed that 105 (87.5%) of the respondents agreed that apart from note that Biology teachers give in class, students also read Biology text books while 18 (12.5%) of the respondents disagreed. Decision made was accepted since the mean value was 3.40 which is higher than the average mean of 2.5. Item 19 revealed that 99 (82.5%) of the respondents agreed that students revision of Biology lessons taught in class by the teacher influences students performance while 21 (17.5%) of the respondents disagreed. Decision made was accepted since the mean value was 3.00 which is higher than the average mean of 2.5. Item 20 revealed that 111 (92.5%) of the respondents agreed that students enjoy doing Biology assignments while 9 (7.5%) of the respondents disagreed. Decision made was accepted since the mean value was 3.30 which is higher than the average mean of 2.5.

In summary, the mean for the total average was 2.84 which is above 2.5. The results shows that questions 15 to 20 gave positive answers while item 16 gave a negative response. Total percentage of 79.6% of students accepted that the

attitude of teachers and students influence students academic achievement in Biology while 20.4% of them disagreed.

Discussion of Findings

The findings of research question one indicated that 84.6 (70.5%) with a mean value of 2.86 of students accepted that class size influence students academic achievement in Biology while 35.4 (29.5%) of them disagreed. This is in line with Adeyemi (2008) in his findings on the influence of class size on the quality of output in secondary schools revealed that schools having an average class size of 35 and below obtained better results in the secondary school certificate examination (SSCE) than schools having more than 35 students per class. Olagunju (2000) in one of his major findings revealed that the class size was found to be negatively related to school academic performance. Yara (2010) in his study on class size and academic achievement of student found out that the performance of students in large classes was very low (23%) compared to those students in smaller classes (64%).

In research question two, 69.6(58%) with mean value of 2.67 of students accepted that the method of teaching adopted by Biology teachers influence students' achievement in Biology while 50.4(42%) of them disagreed. Normah

and Salleh (2006) said that planned, organized and implemented activities by the teacher may develop students more positive attitudes. Teaching methods and students' familiarity with the teacher influence students' attitude towards Biology lessons. Olusola and Rotimi (2012) pointed out that Biology class activities must be planned, organized and implemented so that students may develop more positive attitudes. Biology lessons being held in the classroom on the sole theoretical basis is one of the factors that influence students achievement in Biology toward these lessons in a negative manner.

Normah and Salleh (2006) said that learning by discovery is better than passive listening, and students should be shown how to associate physical concepts with their daily life. Instead of increasing Biology laboratory lessons' hours, hands-on-science experiments which may be executed without effectiveness, attract attention with simple materials should be developed. Practical Biology which is a method of teaching that provides an integrated learning environment with hands-on laboratory measurements coupled with active student problem-solving should be applied in the Biology lessons. In order to improve achievement in Biology, instructors should convince students that Biology serves them. Biology instructors should spend more efforts to associate physics–technology–daily life.

Biology instructors should like their profession and reflect this to others. Such manners of instructors will improve the achievement of students towards Biology lessons and physical experiments (Gok & Silay 2008).

In research question three, 34.4(22.2%) of students with mean value of 1.91 accepted that the availability and utilization of laboratory facilities influence students academic achievement in Biology while 85.6 (77.8%) of them disagreed. Mattern and Schau (2002) findings, teacher's strategy itself was considered as an important factor. This implies that the mastery of Biology concepts might not be fully achieved without the use of instructional materials. Ihuarulam (2008), holds that the adequacy of laboratory facilities makes Biology teaching more concrete and stimulating and hence for better students' academic achievement in secondary schools.

Oladejo, Olosunde, Ojebisi and Isola, (2011) stressed that a professionally qualified science teacher no matter how well trained, will be unable to put his ideas into practice if the school setting lacks the equipment and materials necessary for him or her to translate his competence into reality. A situation that is further compounded by the galloping inflation in the country and many at

times, some of the imported sophisticated materials and equipment are found expensive and irrelevant; hence the need to produce materials locally.

In research question four, 79.6 (79.8%) of students with mean value of 3.15 accepted that the attitude of teachers and students influence students academic performance in Biology while 20.2% of them disagreed.

Zusho, Pintrich and Coppola (2003), assert that the measurement of students' attitude towards Biology should take into account their learning ability. The effect of student's attitude toward science is incredibly important, because in problem solving it requires patience, persistence, perseverance and willingness to accept risk. Also Jach and Cervato (2004) describes attitudes towards Biology as interest in science as open-mindedness, honesty and scepticism and social responsibility.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The study was carried out to appraise the factors that influence students achievement in biology in senior secondary schools in Oredo Local Government Area of Edo State. Four (4) research questions were raised for the study. The design of the study is descriptive survey design while the population comprised of public senior secondary science students in Oredo Local Government Area of Edo state.

The sample size for the study was 100 respondents from public senior secondary schools in Oredo Local Government Area, while the researchers' self-developed questionnaire formed the instrument for data collection which was titled "An Appraisal of Factors Influencing Students' Achievement in Biology in Senior Secondary Schools in Oredo Local Government Area, Edo State." Three experts validated the instrument. Cronbach Alpha was employed to ensure the reliability of the instrument. The reliability of the student's questionnaire was established at 0.75 using Cronbach Alpha

method. The data collected for the demographic variables was analyzed using frequency count, percentage and mean.

Based on the data collected and analyzed, the findings revealed that:

- the total number of students in class (class-size) have influence on students academic achievement.
- the teaching method employed by the teacher in teaching Biology influences students academic achievement.
- the availability and utilization of laboratory facilities have influence on students achievement in Biology.
- attitude of both teachers and students towards the teaching and learning of Biology have influence on students achievement in Biology.

Conclusion

Based on the information shown thus far, students who are exposed to the use of laboratory equipment tend to perform better academically than students who are not exposed to these facilities. As a result, Biology teachers should blend the theoretical aspects of the subject with experimental activity. In addition, the teaching style has a significant impact on pupils' academic success. Learners'

academic performance is significantly affected by a lack of information about teaching styles.

Recommendations

Based on the findings of this study, the following recommendations were made:

- Teachers should employ discovery, group discussion, demonstration, lecturing, research, and inquiry approaches when teaching Biology.
- When there is a sufficient number of students to teacher ratio in public senior secondary schools, students will perform better.
- However, having known that students and teachers attitude can influence students achievements in Biology, a positive attitude should be developed by both teachers and students towards Biology as a science subject.

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APPENDIX I

QUESTIONNAIRE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY

FACULTY OF EDUCATION QUESTIONNAIRE FOR STUDENT

Dear respondent,

The questionnaire is designed to get your candid opinion on the appraiser of the factors influencing the effective teaching and learning of biology. Your cooperation in providing honest and sincere responses to all questions will be appreciated as they will be treated confidentially.

SECTION A

Please, respond to the questions below by ticking [✓] or filling appropriate spaces provided below.

Class: _____

Sex: Male [] Female []

SECTION B

Instruction: Tick [✓] the column that best express your response.

Strongly Agreed (SA), Agreed (A), Disagreed (D), Strongly Disagreed (SD).

S/N	ITEM	SA	A	D	SD
	Influence of class size on students Biology achievement				
1.	The classroom is conducive for learning				
2.	Small number of students in the class influences students learning of Biology				
3.	Large number of student in the class influence students level of concentration during the teaching of Biology				

4.	Students prefer to learn Biology in a small class more than large class				
5.	Students are easily distracted in a large classroom				
	Influence of biology teachers method				
6.	Biology teacher uses variety of method when teaching				
7.	Students learn better when the Biology teacher uses practical approach				
8.	The teaching method adopted by the Biology teacher influence students in learning Biology				
9.	The teaching method adopted by Biology teacher makes the subject boring				
10.	The Biology teacher's teaching method influence students' performance in class				
	Availability and utilization of laboratory facilities				
11.	The school Biology laboratory is well-equipped				
12.	Students have access to the Biology laboratory during practical classes				
13.	Biology practical is done regularly in the laboratory in school				
14.	During practical lessons, Biology laboratory equipment are used				
15.	Unavailability of biology laboratory facilities affect teaching of Biology				
	Influence Students and teachers attitude on students achievement in biology				
16.	The Biology teacher always teach with teaching aids / instructional materials.				
17.	The Biology teacher attend to students even outside the classroom				
18.	Apart from note that Biology teachers give in class, students also read Biology text books.				
19.	Students revision of Biology lessons taught in class by the teacher influences students performance.				
20.	Students enjoy doing Biology assignments				

APPENDIX II

LIST OF SCHOOL VISITED WHEN SHARING QUESTIONNAIRES

No	CODE	Names of Schools.	No of Students
1.	A	Edo college	20
2	B	Edokpolor grammar school	20
3.	C	Idia senior secondary school	20
4.	D	New Era girls senior secondary school	20
5.	E	Ihogbe senior secondary school	20
6.	F	Akenzuwa senior secondary school	20
		TOTAL	120