AN ASSESSMENT OF THE STATE OF BIOLOGY LABORATORIES DURING BIOLOGY PRATICALS IN SENIOR SECONDARY SCHOOLS

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A PROJECT SUBMITTED TO

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CERTIFICATION

We, the undersigned, certify that this work was carried out by **Osarenoma Florence EFIONAYI,** in the Department of curriculum and instructional technology, Faculty of Education, University of Benin, Benin City, Nigeria

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_____
PROF E.O.S. IYAMU
Dean, Faculty of Education

Date:_____

DEDICATION

This work is dedicated to God Almighty for his divine mercy and grace that saw me throughout my stay and study in the University of Benin.

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ABSTRACT

The study assessed the state of Biology laboratories during Biology practical's in senior secondary schools, to make this possible, three research questions were raised to determine whether laboratory facilities are available in secondary schools in Ovia north East Local government area, the influence of laboratory on secondary students practical skills in Biology and if Biology students perform better in Biology with laboratory facilities

Descriptive survey research design was adopted to accomplish the purpose of the study. The population of the study consists of 29 teachers from 29 public secondary schools in Ovia North East Local Government Area of Edo State and 12 accessible teachers were selected as sample for the study using simple random sampling technique. The instrument for data collection was the questionnaire developed by the researcher and was validated by the researcher's supervisor and two other experts from the Department of Curriculum and Instructional Technology. A reliability coefficient was 0.82 was obtained using Cronbach Alpha correlation coefficient method, this showed that the instrument was highly reliable.

The study revealed that the unavailability of Biology laboratory facilities discouraged teaching and learning during Biology practical class. Finally, the study recommends that adequate, functional and modern Biology laboratories should be built by the state government across the secondary schools in Ovia North East L.G.A and that More Biology teachers should be employed to complement the existing one, as Biology teachers in schools are grossly inadequate

CHAPTER ONE

INTRODUCTION

Background to the study

Education is regarded as an instrument of achieving human capital and nation development (Federal Republic of Nigeria (2014). Indeed, education plays a very vital role in the development of nations, that was why Emakunu, Iyiewure and Oronsaye (2014) opined that education across various institution has always been seen as a tool for national development which is the major reason why government all over the world places great premium on the education of its citizenry. The quality and impact of education in a nation's development could give her bragging right within the comity of nations as education has become one of the indices of judging a nation's human capital development which is a proxy and a correlate for national development'' Education is the primary agent of transformation that leads to a sustainable development. It is the catalyst that turns desire into action and vision into reality.

The study of Biology is a unique branch of natural sciences, however, like other natural sciences; it is concerned with the search for in-depth understanding of natural phenomena and events. The most important aspect

of biology is that students not only learn about subject matter that has relevance to their present lives, but also about their environment, human body, organs and which will constantly increase their growth.

For the successful achievement of academic performance of a student in Biology there is need to provide key physical infrastructure which include: - science laboratory, school library, and classroom. Biology laboratory is central to scientific instruction where theoretical work is practicalized where else practical's in any learning experiences involve students in activities such as observing, counting, measuring, experimenting and recording (Cappai, 2017). Without proper and well- equipped Biology laboratory, it is not possible to carry out the science teaching process effectively in any school or educational institution.

Biology laboratory activities are hands-on experiences which emphasis process skills (Desmond, 2018) posited that motor skills help the scientists to find answers to problems and enhance the learning of science. Laboratory activities stimulate learner's interest as they are meant personally

engage in useful scientific activities and experiments. This affords the learners the basic skills and scientific methods of problem solving.

The availability and state of infrastructure in education is undeniably important in improving the quality of education itself. One of the important infrastructure facilities is laboratory. Laboratory is a room where the practice or research activities is conducted and supported by the existence of a set of laboratory equipment as well as the complete laboratory infrastructure. Amien, Moh (2018) distinguished types of laboratories in terms of the purpose and function which can be divided into: 1) a basic laboratory, a place that can be used by the student to introduce and understand the basic concepts which are demanded to develop further knowledge; 2) development laboratory is used to develop specific tasks, according to the specialization fields of science by personnel in the laboratory; 3) teaching methodology laboratory is a ride and a pedagogical competence development (teacher training) for prospective teachers; and 4) research laboratory is a place to conduct scientific activities in the discovery of concepts, principles, theories, principles, rules, or laws in the field of knowledge acquired or referred to as a scientific product. Biology Laboratory is a platform to train students' skills

in practice, demonstrations, experiments, research, and development of self-reliance skill that they can carry throughout their carrier.

In the implementation of learning, especially in Biology should not only convey the theory, but also linking between theory and practice. The principles will be assessed in practice while contained in practical experience sought basics in theory. The relationship between theory and practice is integrative, in which theory and practice are alternately and gradually complement and assess each other.

Therefore, the state of Biology laboratories during Biology practical's in Senior Secondary Schools cannot be under emphasize as practical's cannot take place effectively if there is no laboratory or if the laboratory is under equipped.

Statement of the Problem

The role of science education in the socio-economic development of any nation hardly needs any arguments. Bello and Abimbola (2015) rightly noted that 'the socio-economic development of a country cannot rise above

its level of scientific and technological development; it is obvious that science education is a potent tool for the security of the country.

The need to achieve a sustainable growth in impacting the right teaching, knowledge and attitude of Biology to student cannot be attain with the proper use of laboratory equipment during Biology classes and practical's.

In spite of the laudable qualities of Biology as a field of study there are still a number of hooks which impede the growth, teaching and learning process and poor academic performance among secondary school student in Biology. This worrisome factors include, lack or non-availability of Biology laboratory during biology classes and practical's, unequipped laboratory in most secondary school, proper knowledge of the use of the laboratory facility by Biology teachers. It is yet unknown to the researcher the impact of laboratory facility on secondary school student. Against this background, this study is undertaken to assess the state of Biology laboratories during Biology practical's in senior Secondary Schools

Purpose of the study

The main purpose of this study was to assess the state of Biology laboratories during Biology practical's in senior secondary schools. Specifically, the study will determine:

- Whether laboratory facilities are available in secondary schools in Ovia north East Local government area
- the influence of laboratory on secondary student practical skills in Biology
- if Biology students perform better in Biology with laboratories facility

Research Questions

The following research questions will guide the study

1. Are Biology laboratory facilities available in secondary schools in Ovia north East?
2. What is the influence of laboratory on students practical skills in Biology among secondary school students?
3. Do Biology students perform better in Biology with laboratory facility?

Significance of study

Findings from this study would be beneficial to state and federal Government on the need to provide adequate and well-equipped laboratories to secondary schools where they can learn and carry out their practical to enhance their academic performances.

It will also help the students to be familiar with new technological equipment for better learning.

This study will also contribute to academic knowledge and serve as a foundation upon which further research can be made.

This research will equip school administrators, managers, inspectors, parents, teachers, and members of the society who are stakeholder's business of education to do the following among others;

1. to value, maintain and use school facilities in the most appropriate ways.

2. To understand the impact of school facilities on academic performance of students especially in Biology.

Scope and Delimitation of the study

This study is delimited in assessment of the state of Biology laboratories during biology practical's in senior secondary schools in Ovia North East Local Government Area of Edo State.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with the review of related literature on this study done the following sub-headings;

- Student's Academic Performance in Biology
- Laboratory Facility Which Contributes to Academic Performance of Students
- Impacts of Laboratory Facilities on Student's Academic Performance in Biology
- Teacher Factors Which Contribute to Academic Performance
- Strategies For Improving Laboratory Facilities In Biology
- Summary of Review of Related Literature

Student's Academic Performance in Biology

The key variable which was defined is academic performance is that academic performance determine the human capital development of an economy; it enable students and parents to know the current academic state of their students; and it determines the failure and success of an academic institution (Narad & Abdullah, 2016).

Academic performance have been defined and explained by several authors. According to Narad and Abdullah (2016) academic performance is the knowledge gained which is assessed by marks by a teacher and/or educational goals set by students and teachers to be achieved over a specific period of time. They added that these goals are measured by using continuous assessment or examinations results. Annie, Howard and Midred (as cited in Arhad, Zaidi & Mahmood, 2015) also indicated that academic performance measures education outcome. They stressed that it shows and measures the extent to which an educational institution, teachers and students have achieved their educational goals. Similarly, Yusuf, Onifade and Bello (2016) opined that academic performance is a measurable and

observable behaviour of a student within a specific period. He added that it consist of scores obtained by a student in an assessment such as class exercise, class test, mid-semester, mock examination, and end of semester examination. Again, Martha (2009) emphasized that academic performance of students is defined by a student's performance in an examination, tests, and in a course work.

The definitions given by the authors' shows that the definition of academic performance is based on measurable outcomes such as class exercise, test, and examinations results. Based on this, the operational definition of academic performance used in this study is the results obtained by a student at end of a specific term in all subject. Per this study a student who obtains good aggregate is considered to be academically good; and the percentage pass is 50 percent and above

The attitude of students towards learning Biology has been found to have a significant relationship with academic performance. For example, Awang, Ahmad, Bakar, (2013) found that there is statistical significance relationship between students attitudes towards their learning and academic

performance. Janssen and O'Brien (2014) argued that although students learning have an impact on academic performance, it is indirect. Notwithstanding their findings, Manoah, Indoshi and Othuon (2011) confirmed that in the case of biology, students' attitude towards the subject has a direct impact on their academic performance. However, Langat (2015) found that students who had positive attitudes towards Biology did not affect their score.

Hamid (2010) asserted that students' personal motivation plays a vital role towards their academic performance. They found that both intrinsic and extrinsic motivation has a positive on students' academic performance. They added that intrinsic motivation has a strong predictor towards academic performance than extrinsic motivation. Similarly, Shahzadi (2015) concluded that motivation play an important role in the success of a student academics. In their study, they found that intrinsic and extrinsic motivation had a positive statistical significance relationship with academic performance. They outlined that students motivational characteristics such as self-exploration, altruism, and career focused and manages social pressure have a positive impact on their academic performance. Using structural

equation modeling analysis to assess the effect of motivation on performance, Croiset (2013) categorized motivation into Random Autonomous Motivation (RAM), Controlled Motivation (CM) and Autonomous motivation (AM). They found that RAM which they define as intrinsic motivation is positively correlated with academic performance. Additionally, Zalani and Parhon (2016) argued that the academic performance of students is affected by a combination of different motivational factors.

The literatures reviewed indicated that students factors which influence their academic performance especially in Biology is a combinations of several indicators. From this review, it was found that interest in a subject, regular studying, going for practical's, class attendance, self-motivation and attitude of student towards learning are the key factors which affect their academic performance in biology. All the literature reviewed with the exception of Langat (2015) who found that there is a positive relationship between these factors and academic performance. This implies that if a student exhibit positive attitude towards these factors his/her academic performance will improve, all other things being equal.

Impacts of Laboratory Facilities on Student's Academic Performance in Biology

Laboratory has been conceptualized as a room or a building specially built for teaching by demonstration of theoretical phenomenon into practical terms. Ibrahim (2018) argued the saying that “seeing is believing” as the effect of using laboratories in teaching and learning of Biology and other related disciplines as students tend to understand and recall what they see than what they hear or were told. Laboratory is essential to the teaching of Biology and improvement of student academic performance and the success of Biology are much dependent on the laboratory provision made for it. Affirming this, Ogunsanya (2013) said there is a general consensus among educators that the laboratory occupies a central position in instruction. It could be described as a place where theoretical work is practicalized whereas practical’s in any learning experience involve students in activities such as observing, counting, measuring, experimenting, recording, observation and carrying out field work. These activities are totally different from the theoretical work which involves listening to talks and taking down notes from such talks.

According to Ango (2016) laboratory work stimulates learners' interests as they are made to personally engage in useful Biology activities like experimentation; it also promoted that Biology is not only product or process; but affords the learner the basic skills and systematic method of problem solving and knowledge obtained and promotes long term memory.

Laboratory helps to provide a forum wherein the learner is given the exercise to subjects, his beliefs, ideas, statements, theoretical propositions etc. to some forms of experimental test (Soyibo, 2015). To maintain and arouse the interests of students in subjects involving laboratory work, the teacher should be effectively involved in order to transfer knowledge and facts to learners for a good performance in any examinations. In line with this, one then pauses to ask, to what extent has laboratory been able to achieve its objectives. Odulaja (2016) highlighted that the teacher assumes a position of dispenser of knowledge with the laboratory serving the function of drill or verification. They further explained that at the other extreme, the teacher assumes the position of guide to learning and laboratory as a place where knowledge is discovered. However, there are growing evidences that teachers do not exhibit behaviours which are complementary to achieving

the stated objectives. They include methods of teaching practical work; inadequacy or absence of well-equipped laboratories; high enrollment of students; inadequacy of resources for teaching and learning practical work; quantity and quality of teachers.

Falide (2014) discovered in her survey of the resources for the teaching and learning of Biology subjects in some of the new secondary schools in Lagos that there was a general inadequacy of resources. She also found out that 80 per cent of the schools had no laboratory at all, while the remaining 20 percent had rooms labeled “laboratory” without adequate equipment, she concluded that teaching of biology subjects practical’s by teachers would be difficult and that students learning experiences would be limited. In his contribution, Balogun (2012) submitted that no effective Biology education programme can exist without equipment for teaching. Writing on the situation of our secondary schools In terms of academic achievement, Soyibo (2014) have shown that schools with well-equipped laboratories have better results in the school certificate science examinations than those that are ill-equipped. Corroborating this, Guanara (2017) reiterated that students instructed entirely by the laboratory methods had

higher attitude's scores but lower achievement scores than students instructed entirely by the traditional lecture or textbook mode.

Yadar (2011) opines that no Biology subjects can be considered as complete without including some practical work. The practical work ought to be carried out by individuals either in Biology laboratories or in classes. At school level, practical work is even more important because of the fact that we learn by doing. Scientific practices and applications are thus rendered more meaningful. It is an established truth that an object handled impresses itself more firmly on the mind than the object merely seen from a distance or in an illustration. Thus practical work forms an important feature in Biology (UNESCO, 2008). In view of these different and conflicting findings, the study found the relationship between teachers' quality and students' academic achievement.

Teacher Factors which Contribute to Academic Performance

Teachers play vital role towards the academic performance of students especially in biology. A study conducted by Kimani, Kara and Njagi (2018) in Kenya on teacher factors influencing academic achievement, found that

teachers experience, age, gender and professional qualification had no statistical significant relationship with academic performance of students. However, they noticed that performance targets, completion of syllabus, paying attention to weak students, assignments, student evaluation, and the teaching workload of a teacher had significant relationship with students' academic performance. In Nigeria, Akiri and Ugborugbo (2019) also found that there is no statistical relationship between teacher effectiveness and academic performance.

Ganyaupfu (2013) on the other hand asserted that combination of teacher and student centred method have a positive effect on academic performance. They concluded that student centred method is more effective than teacher approach. Musili (2015) added that teacher experience and professional training have a significant impact on students' performance. Blazar (2016) confirmed that the impact teachers have on the academic performance of their students is substantial. But stressed that little is known about the specific teacher factors which contributes to the academic performance of students.

Furthermore, Akinsolu (2010), concluded that teacher-student ratio, teacher's experience and qualification has a significant impact on academic performance. Similarly, Ewetan and Ewetan (2015) emphasized that the level of teacher's experience has significant impact on academic performance in subject matter. They posited that school with teachers with more than 10 years' experience performs better than school with teachers with less than 10 years' experience.

Teacher factors that significantly affects students' academic performance as reviewed above includes: Teachers teaching experience, completing of syllabus, paying attention to weak students, assignments, students' evaluation, teacher effectiveness, teacher and student centred method of teaching, professional training, teacher to student ratio and qualification of teachers. It was also noticed that teacher's age and gender have no effect on students' academic performance.

Strategies for Improving Laboratory Facilities in Biology

The teaching and learning experience is centered on the extent of adequacy of laboratory facilities in secondary schools and teachers

effectiveness in the use of the laboratory facilities with the aim of facilitating and providing meaningful learning experiences in the learners. Although some facilities may be available and adequate but may not be put into use by the Biology teachers. Obong (2016) is of the view that audio-visual aids such as computers and 13 projectors are not utilized in schools due to lack of knowledge on proper use of such resources for teaching. Achimagu,(2016),classified resource materials (facilities) into classrooms, laboratory equipment/chemicals and textual/audio-visual materials. Resources or facilities according to Obong (2016) refers to facilities that can be used to enhance or improve educational programs and promote teaching and learning. Laboratory facilities can be human or material.

The human resources have to do with personnel such as Biology teachers and laboratory technologists or assistant. He added that Biology laboratory facilities are those materials available to the Biology teachers for teaching and learning and these may include text books, computer, sewing machine, kitchen equipment, fire extinguishers, chalk boards, first aid kits, ovens, incubators, models, chemicals, television and other electronic devices. Utilization of existing laboratory facilities is the frequency with which the

existing laboratory facilities are used during the laboratory experiments by the teachers for the enhancing effective teaching of Biology. In this case effectiveness would be in terms of academic performance in the Biology and ineffective teaching is seen as the failure to achieve in Biology.

Hoften and Ginetta (2017) contented that the laboratory has a distinctive feature in teaching and learning. For students to learn effectively, teachers should ensure that adequate laboratory facilities are procured and effectively utilized. Olsen (2016) suggested that laboratory activities designed to verify known scientific concept or laws may not always go forward as designed or planned. In accordance to the statement, teachers would need a research about the laboratory activities done prior to bring out the results appropriate for which would satisfy the process and skill (knowledge) being imparted to the learners. This therefore, would require the teachers to carry out laboratory activities before and utilize the available facilities. The laboratory based mode of presentation of concepts has been constantly found to be an important strategy in teaching and learning in secondary school.

Empirical Review of Related Literature

Ihuarulam (2018) investigated the perception of Biology teachers and students based on the utilization of 14 laboratory facilities secondary schools for Biology teaching. The findings, using a total of one hundred and fifty students, showed that 41 .2% of the total respondents agreed that laboratory facilities were adequately utilized during the Biology teaching and more than half (58.9%) of the respondents said that laboratory facilities were never utilized during teaching.

Olarewaju (2014) explained that, utilization of laboratory facilities as a process of "teaching" through practical procedures was a manipulative process of learning which promoted good academic performance in teaching and learning. Olarewaju added that among other factors, when laboratory facilities are adequately utilized by students it elicited desired behavioral change in the learners. Utilization of laboratory facilities is an activity oriented instructions; student centered and leads to self-reliant instruction. Adeniyi (2013) drew attention to the relationship between utilization of laboratory facilities and students' academic performance and found out that

utilization of laboratory facilities is significantly related with students' academic performance in the subject.

Mathew (2018) discovered that utilization of laboratory facilities had a positive relationship with students' academic performance towards Biology teaching and promotes good academic performance in the subjects. Jatua (2018) analyzed the extent of utilization of laboratory facilities and students' academic performance in secondary schools in Pankin. The findings were that teachers possessed adequate knowledge of the utilization of laboratory facilities for teaching in secondary schools.

Edet (2018) investigated the influence of utilization of laboratory facilities and students' academic performance. Using a sample of two hundred senior secondary school one students taught by utilization of laboratory facilities and the control group taught without utilization of laboratory facilities during teaching. The results showed that students taught using laboratory facilities frequently achieved higher than those taught without utilizing the laboratory facilities. The recommendation made based on this finding was that utilization of laboratory facilities should be

encouraged at all levels of the education sector. Hager (2014) based on the instructional theory of learning interaction, hypothesized that the laboratory had direct effect on both the student's attitude and academic performance. It is generally believed that constant practice leads to proficiency in what learners learns during classroom instruction, hence the dictum "practice makes perfect". This has given rise to expectation laboratory facilities should be adequately provided by the secondary schools for effective teaching and learning.

Onyeji (2014) had earlier reported that none of these new media (electronics) is available or used d in communicating science, technology and mathematics in secondary schools. Physical laboratory facilities are the fundamental factors for better learning and achievements of the students. Lyon (2012) stated that learning is a complex activity that involves interplay of students' motivation, physical facilities, teaching resources, skills of teaching and curriculum demands. The process of managing and organizing resources is called resource utilization. The utilization of resources (laboratory facilities) in education brings about fruitful learning out comes since resources stimulate students' learning as well as motivating them.

Kitheka (2015) noted that schools with abundant resources may not always utilize them efficiently and consequently fail to raise students' level of performance. On the other hand schools with limited resources may utilize what they have efficiently and this boost learning thus the teachers should be able to maximize and utilize the available resources so as to adequately achieve educational objectives.

Ngala (2017) noted that utilization of available resources is more important than quantity. This is supported by Cohen (2013) who pointed out that it is not making resources available in schools that matter, but getting these resources utilized by teachers and students to get academic content learned. This is further supported by Adeleye (2015) as he noted that, the greatest hindrance to the effective teaching in schools is not lack of necessary apparatuses but rather lack of their effective utilization. According to Ongiri and Abdi (2014) noted that , performance in Certificate of Secondary Examination (CSE) has remained poor with majority of students scoring a grade of C in English language and sciences which are the core 16 subjects thus contributing to overall low district mean grade of C. This is a poor grade as it limits students from entry into science based degrees and

diploma courses since educational resources are important in students learning. They hypothesized that poor performance could be partly due to shortage of or ineffective utilization of educational resources.

According to Lawal (2013) observed that utilization of laboratory equipment defines the extent or show how often the available laboratory equipment are used during classes or laboratory sessions. He further added that such materials promotes learning by doing, make the classroom lively, real and meaningful and have potential to make the content permanent thereby increasing students' performance. This therefore allows the learners to focus their attention to important issues and acquire practical skills hence the need for maximum use of such equipment cannot be overemphasized. Oluwasegun, Ohwofosirai and Emabetere (2015) examined the impact of laboratory equipment on students, they found out that the use of laboratory equipment facilitate the teaching and learning of physics, inculcate scientific reasoning and enhances academic performance in the subject. Olufuke (2012) in his study found that schools with highest frequency study of utilization of the laboratory equipment had the highest mean score followed by schools with average and low frequency utilization respectively.

In another study by Nwagbo and Uzoma (2014) on the effect of practical activities on secondary school students ' process skills acquisition in Abuja municipality council, practical activity method of teaching and learning was found out to be more effective in fostering students acquisition of science process and skills which may eventually improve students' performance. Whereas several research studies on influence of laboratory equipment found significant relationship between utilization of these facilities and students' academic performance. (Nsagba and Igboabuchi, 2010, Neji (2010) in contrast found no significant relationship between utilization of laboratory facilities and students' academic performance in chemistry. Yet, inappropriate, inadequate and non-utilization of laboratory facilities have been identified by some authors as some of the possible cause of students' poor performance. For instance, Aderonmi (2016) found that students 17 often complained from non-familiarization with laboratory equipment until a few weeks to external examinations and in most cases, even the teachers of the subjects did not know the use of the laboratory equipment and until the practical examinations. Chukwuemeka (2018), examined the efficacy of utilization of laboratory facilities in teaching junior

secondary schools and revealed that pupils who were allowed by their teachers to manipulate laboratory facilities by themselves did better academically than those who were not allowed to. Moreover, it showed that the extent of utilization of laboratory equipment's during teaching of basic science had a significant influence on the students' academic performance.

Summary of Reviewed Literature

This chapter has reviewed the related literature for the study. The review indicated the assessment of the state of Biology laboratories during Biology practical's in senior secondary schools.

The study shows Laboratory has been conceptualized as a room or a building specially built for teaching by demonstration of theoretical phenomenon into practical terms. Ibrahim (2018) argued the saying that "seeing is believing" as the effect of using laboratories in teaching and learning of Biology and other related disciplines as students tend to understand and recall what they see than what they hear or were told. Laboratory is essential to the teaching of Biology and improvement of

student academic performance and the success of Biology are much dependent on the laboratory provision made for it.

Although this study reviewed tries to filled this gap but not specifically ascertain the aim at which this study was undertaking to assessment of the state of Biology laboratories during Biology practical's in senior secondary schools in Ovia North East local government area of Edo state.

CHAPTER THREE

METHOD OF THE STUDY

This chapter deals with the method and procedure used in this study. It was arranged under the following sub-heeds:

- Research Design
- Population of the study
- Sample and Sampling Technique
- Research Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

Research Design

Descriptive survey research design was adopted for this study. This study which aim at collecting data on, and describing it a systemic manner the characteristics, features or facts about a given population. These studies are interested in describing certain variables in relation to the population (Nworgu, 2015). Omozuhiomwen (2018) carried out a study on availability

and utilization of laboratory in the teaching and learning of Biology in senior secondary schools in Oredo and Atewe (2018) carried out a study on influence of biological practical in academic achievement of Senior Secondary Schools Students in Ovia North East Local Government Area. The successful application of the design in similar studies informed its use in this present study.

Population of the Study

The population of this study comprised of the 29 Biology teachers in the Public Secondary Schools in Ovia North East Local Government of Edo State (Ministry of Education, 2021).

Sample and Sampling Technique

A total of 12 Biology teachers constituted the sample for this study. The simple random sampling technique was used to select the Biology teachers. This involves balloting with replacement. A piece of paper that was numbered 1 to 29, folded and placed in a bow, which was turned around, and one is picked at a time, this procedure was used to select the twelve(12) Biology teachers for the study.

Instrument for Data Collection

The instrument that was used to collect data for this study was the questionnaire. The questionnaire was made up of two Sections, A and B. Section A was designed to sort the bio-data of the respondents while section B contained short items that elicited information regarding assessment of Biology laboratories during practical Biology in Secondary Schools. The questionnaire was titled "Biology Laboratories Practical Questionnaire" (BLDQ). The questionnaire consisted of 15 items, it used rating scale format with 4 choices per item, using the rating scale of 4=Strongly Agree (SA), 3=Agree (A), 2=Disagree (D), and 1=Strongly Disagree (SD).

Validity of the Instruments

The face and content validity of the instrument was done by three experts, these included; the researcher's supervisor, one expert from the Department of Animal and Environmental Biology and one from the Department of Educational Evaluation and Counselling Psychology all from the University of Benin. Their criticisms, corrections, suggestions,

modifications and recommendations served as the final draft of the instrument.

Reliability of the Instrument

The instrument was administered to 10 Biology teachers in Ovia North East Local Government Area of Edo State, who were not part of the study sample. Data collected were analyzed using Cronbach Alpha statistics and a coefficient value of 0.82 was obtained, which indicated that the instrument was reliable for the study.

Method of Data Collection

A letter of permission was obtained from the Department of Curriculum and Instructional Technology. This letter introduced the researcher to the principal of the School. On getting to the School, the researcher first point of call was the principal's Office, thereafter the principal handed the researcher to the biology teacher. The administration of the instrument lasted two weeks. However, after completion, the questionnaire forms were retrieved.

Method of Data Collection

Data collected were analysed using descriptive statistics of frequency and percentages as well as mean and standard deviation.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

This chapter deals with data presentation, data analysis and discussion of findings.

Presentation of results

Table 1: Socio-Demographic Data of Respondents

SEX (%)	Frequency	Percentage (%)	Cumulative
Male	3	15.0	15.0
Female	9	75.0	100
Total	**12**	**100**	

Table 1 showed the socio-demographic characteristics of respondents. Results shows that 15% of the respondents were male while 75% female.

Table 2: Distribution of respondents by academic qualifications

Educational Qualification	**Frequency**	**Percentage (%) Cumulative (%)**
Diploma	2	16.7	16.7
OND	2	16.7	33.4
HND	5	41.6	75
Total	**12**	**100**	
Bsc. Ed	3	25	100

Table 2 shows that 16.7% of the respondents had Diploma, 16.7% had OND, 41.6% had HND while 25% had Bsc. Ed.

Research Question 1: Are Biology Facilities Available in Secondary Schools in Ovia North East L.G.A?

Table 3: Availability of Biology Laboratory Facilities

S/N	Items	X	SD	DECISION
1	There is Biology laboratory in my school	2.38	.571	Low Extent
2	The Biology laboratory in my school is well equipped	2.12	.578	Low Extent
3	All specimen for practical's is complete in my school Biology laboratory	2.28	.504	Low Extent
4	Apparatus is available in our Biology laboratory	2.10	.443	Low Extent
5	We have more than one Biology laboratory in my school in case of large class	2.11	.601	Low Extent
	Cluster	**2.246**		**Low Extent**

In table 3, the five items had a mean lower than 2.5 while the cluster mean was lower than 2.5. This shows that Biology laboratory facilities availability in secondary schools in Ovia North East is low

Research Question 2: What is the influence of laboratory on student practical skills in Biology among secondary school students?

Table 4: Biology Laboratory on Students Practical Skills

S/N	Items	X	SD	DECISION
1	It increases student's participation in practical classes	2.82	.578	High Extent
2	It assists student to perform practical's on their own	2.58	.643	High Extent
3	Laboratory helps to improve student performance with Biology instrument	2.65	.485	High Extent
4	It helps students to have their own apparatus	2.84	.647	High Extent
5	It increases student interest in learning	2.93	.711	High Extent
	Cluster	**2.76**		**High Extent**

In table 4, the entire variable has a mean greater than 2.5 while the mean cluster was greater than 2.5. This shows that the influence of the laboratory on student practical skills in Biology among secondary school students is high.

Research Question 3: Do Biology students perform better in Biology with laboratory facilities?

Table 5: Students Performance with Biology Laboratory Facilities

S/N	Items	X	SD	DECISION
1	Students who do poorly in Biology theory classes perform better in practical classes	2.94	1.038	High Extent
2	Biology comprehension among students is higher with the use of laboratory equipment's	2.92	.703	High Extent
3	I use laboratory practical to assess my student learning ability	2.66	.647	High Extent
4	Students grades are improved with practical's	2.60	.632	High Extent
5	Students tend to pay more attention during Biology practical's	2.58	.770	High Extent
	Cluster	**2.74**		**High Extent**

In table 5, the entire variable was greater than the mean cut point of 2.5. While the cluster mean obtained is greater than 2.5. This shows that Biology student perform better in Biology in laboratories facility is high.

Discussion on Findings

Discussion of findings is based on the research questions raised.

Research question one, the study shows that Biology laboratory facilities available in secondary schools in Ovia North East is Low. This is contrary to another study by Nwagbo and Uzoma (2014) on the effect of practical activities and availability of laboratory facilities on secondary school students' process skills acquisition in Abuja municipality council, practical activity method of teaching and learning was found out to be more effective in fostering students' acquisition of science process and skills which may eventually improve students' performance.

Research question two, the findings of study revealed that the influence of laboratory on students' practical skills in Biology among secondary school students in Ovia North East Local Government Area is high. This is in correlation with Yadar (2011) who opines that no Biology subject can be considered as complete without including some practical work. The practical work ought to be carried out by individuals either in biology laboratories or in classes and also in line with Soyibo, (2015) who

indicated that laboratory helps to provide a forum wherein the learner is given the exercise to subject, his beliefs, ideas, statement, theoretical propositions etc. to some form of experimental test.

Research question three shows that Biology students perform better in Biology with laboratory facilities is high. This is in line with Soyibo (2014) who have shown that school with well-equipped laboratories have better results in school certificate science examinations than those that are ill-equipped. Corroborating this, Guanara (2017) reiterated that students instructed entirely by the laboratory methods had higher altitude's scores but lower achievement scores than students instructed entirely by the traditional lecture or textbook mode.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The purpose of this study was to assess of the State of Biology Laboratory during Biology Practical's in Senior Secondary Schools in Ovia North East Local Government Area of Edo State. Three research questions were raised in this study. Descriptive design of the survey type was adopted for this study. The population of this study comprised of the 29 Biology teachers in public secondary schools in Ovia North East L.G.A. 12 Biology teachers made up the sample for this study, simple random technique was used to select the teachers. The instrument that was used for this study was a questionnaire. The instrument was validated by three experts, drawn from University of Benin. The reliability of the instrument was analysed using Cronbach Alpha Statistics and a coefficient values of 0.82 was obtained an indication that the instrument was reliable. A letter of permission obtained from the Department of Curriculum and Instructional Technology, aided the

researcher in data collection. Data collected were analysed using frequency and percentages as well as mean and standard deviation.

Conclusion

Based on the findings of this study. It was therefore concluded that unavailability of Biology laboratory facilities will discourage teaching and learning during Biology practical class.

Recommendations

From the findings of the study and conclusion drawn. The following recommendations were made:

- Adequate, functional and modern biology laboratory should be built by the state government across the secondary schools in Ovia North East L.G.A
- More Biology teachers should be employed to complement the existing one, as biology teachers in schools are grossly inadequate

- Students should be given more opportunities to be exposed to real life experience in the teaching of Biology practical as this is what modern and well equipped Biology laboratory sets to achieve.

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APPENDIX A
DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY
FACULTY OF EDUCATION
UNIVERSITY OF BENIN
BENIN CITY

I am a final year student of the above-mentioned department in University of Benin, conducting a research on "assessment of the state of biology laboratories during biology praticals in senior secondary schools." as part of the fulfillment of my BSc.Ed. degree programme. It will be highly appreciated if the questions below are answered correctly by ticking (√) in the appropriate space provided. Your confidentiality is assured.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1) **Gender**: Male ( ), Female ( )
2) **Educational qualification:** Diploma ( ), OND ( ) HND ( ) B.Ed. ( ), M.sc

Section B: Please tick [√] in the most appropriate option for each item.
Key: SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree

S/N	ITEM	SA	A	D	SD
	Are Biology laboratory facilities available in secondary schools in Ovia north East?				
1	There is Biology laboratory in my school				
2	The Biology laboratory in my school is well equipped				
3	All specimen for practical's is complete in my school Biology laboratory				
4	Apparatus is available in our Biology laboratory				
5	We have more than one Biology laboratory in my school in case of large class				
	What is the influence of laboratory on student practical skills in Biology among secondary school students?				
6	It increases student's participation in practical classes				
7	It assists student to perform practical's on their own				
8	Laboratory help to improve student performance with Biology instrument				
9	It helps students to have their own apparatus				
10	It increases student interest in learning				

	Do Biology student perform better in Biology with laboratory facility?				
11	Students who do poorly in Biology theory classes perform better in practical classes				
12	Biology comprehension among students is higher with the use of laboratory equipment's				
13	I use laboratory practical to assess my students learning ability				
14	Students' grades are improved with practical's				
15	Student tend to pay more attention during Biology practicals				