PROBLEMS MILITATING AGAINST EFFECTIVE TEACHING AND LEARNING OF SCIENCE SUBJECTS IN SENIOR SECONDARY SCHOOLS IN OVIA NORTH EAST LOCAL GOVERNMENT OF EDO STATE

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A RESEARCH PROJECT SUBMITTEDTO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, NIGERIA IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE BACHELOR DEGREE (B.Ed) IN CHEMISTRY EDUCATION

DECEMBER, 2019

CERTIFICATION

We the undersigned certified that this research project was carried out by Possible Ovime AKERELE with matriculation number EDU1502735 in the department of curriculum and instructional technology, University of Benin, Benin City.

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DEDICATION

This work is dedicated to God Almighty for divine life, strength and grace throughout the duration of this project and successful completion.

ACKNOWIÆDGEMENT

Special thanks goes to my project supervisor Dr. Mrs Oyakhirome for her useful suggestions, great sense of humor and guide lines given to me which led to the successful completion of this work. May God continue to lift her up in life. The researcher's heart felt gratitude to her parents, Pst and Mrs Akerele for their love, admonishment, prayers, encouragement, provisions, support towards the actualization of this goal. Thanks Mum for always being my love and rock, God richly bless you both and take you places. A big thank you to the researcher's siblings; Victor, Winner, Praise and Excel_ Bright, I love you all so much. A very big thanks to the researcher's aunts; Mrs Comfort Balogun, Mrs Titi Adentan, Mrs Comfort Raji and Mrs Ometere Alao. Special thanks to the researcher's roommates; especially Fortunes Ika cell leader, Faith the trouble maker and Chioma my bunkie. The researcher's heartfelt gratitude goes to all her course

mates for theration of the course. The researcher appreciation goes to Living Faith Church aka Winners chapel especially the resident pastor and the transport unit.

Finally, the researcher gratitude goes to Sia for the inspiration I got through her songs during the course of this research. Big thanks also goes to Beyonce, Ciara and Clean Bandit for keeping me awake through the duration of this research.

ASTRACT

This study assessed the problems militating against effective teaching and learning of science subjects in senior secondary schools in Edo state.

The study was carried out in Ovia North East local government area of Edo state. Five research questions guided the study.

The design of the study is survey research design. A sample of ten (1O) students each from five (5) schools were used for the study. The instrument used was a researcher developed questionnaire tagged problems militating against teaching and learning of science subjects in

senior secondary school (PMAETLSQ). The questionnaire was validated by my project supervisor. The data generated was interpreted using simple percentage statistical analysis.

The major findings were that most science teachers are experienced I teaching the subjects but not qualified academically, most public schools have science laboratories but are not practically taught science in the laboratory and that school ownership affect teaching and learning of science. Recommendation were made to the government and school board on how to eradicate these problems in senior secondary schools.

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CHAPTER ONE

INTRODUCTION

Background of study

In recent times, there has been an increasing concern for effectiveness and efficiency in the learning process. Education and learning are among the most important of all human activities and always have been the principle means of productive and sustainable societies. Science (physics, chemistry, mathematics, biology, computer science) have been taught for more than two decades in the senior secondary and tertiary levels of institution have been given unquantifiable reorganization because of its invaluable significance to the entire world. It is therefore important at this junction to give definite meaning to the word “science”. Science is the branch of natural science that deals with the composition and constitution of substances and the changes they undergo as a consequences of alterations in the constitution of their molecules.

According to wikipedia; science is a discipline involved with elements and compounds composed of atoms, molecules and ions: their composition, structure, properties, behavior and the changes they undergo during a reaction with other substances.

The general objectives of learning science in secondary schools are:

- To work according to the students’ science method and developed the scientific views.
- To impart the knowledge to the students about the world, the importance of Science and its effects on society and its environment and give them the knowledge of the role of the environment so that learners can utilize the correct methods of the uses of the environment.

- To use scientific method i.e problem, hypothesis, experiment, a conclusion in decision making.
- To develop the competency to apply his knowledge to the solution of the problems around him he or she has an understanding of the technological processes so that he or she can use it in his or her surroundings.
- He or she should develop desirable scientific attitudes and values like cooperation, team, spirit, fellow feeling, leadership, courage, truthfulness, honesty, and sincerity.

Over the years science be seen in all aspect of our everyday life from what we eat down to what we wear. The use of science is a great tool in bringing about a better and efficient world. Due to the importance of science, its studies is being evaluated and revised very to be able to implement the new knowledge gotten every day.

At senior secondary school (SSS) level of education, several factors have been Identified to teaching and learning of science. Some of which are; school type, school ownership, inadequate laboratory facilities, lack of qualified teachers in the field, etc. All this can stand to militate against the effective teaching and learn.

Statement of the problem

This tread of poor performance in science subjects (chemistry, physics, biology, computer science) have sometime been observed among senior secondary schools by the Edo ministry of education. Although concerns have been made by parents, teachers and other stake holders about the abysmal performance of SSS students in science subjects (chemistry, physics, computer,

biology), no discemable efforts have been made to reverse the trend. Consequently, there have been low students enrollment for science subjects in the SSCE exams.

Although this abysmal performances have been traced to certain factors that generally affect the educational process. Since the educational process is not complete without teaching and learning, its challenges have always been in the Nigeria educational system. The main problems militating against effective teaching and learning have not been ascertain, the researchers therefore aims to identity the problems militating against teaching and learning of science subjects and investigate how they affect both the teachers and learners so that proper recommendations that will see to the students' performance in an examination as well as the attainment oK the goals of the National policy on education (2004).

Purpose of the study

This study is to ascertain the problems militating against effective teaching and learning of science subjects in senior secondary schools in Ovia North East Local Government Area of Edo state and also to proffer reasonable, implementation and lasting solutions to these problems. However, the study is aimed at determining the following specifically:

- To find out if there are qualified science subjects teachers to teach the subject in Ovia North East Area.
- To investigate the availability of laboratory, laboratory equipment and charts for teaching and learning of science subjects in Ovia North East Area of Edo State.

- To investigate whether students are practically taught science subject using science laboratory in senior secondary schools of Ovia North East Area of Edo State.

Research questions

- Are there qualified teachers to teach the subjects?

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- Are there good instructional materia! for teaching the subjects?
- Does school type affect teaching and learning of science subjects?
- Does school ownership affect teaching and learning of science subjects?
- Are students practically taught the science subjects in the science laboratories?

Significance of the study

For any research work to be meaningful, it must contribute to the volume of existing knowledge in the field under investigation. In view of this it is the conviction of the researcher that information obtained from this work will help address some of the challenges that confront effective teaching and learning of science subjects at the senior secondary schools SS3 level of education in Nigeria. Also, the work is to suggest remedies that will make students learning of science subjects interesting and enjoyable as well as make it a smooth ride for the teachers. It is the belief of the researcher that suggestions and recommendation made in this work can help the Ovia North East authority as well as Edo state Education authorities to revamp the teaching and learning of science subjects in senior secondary schools of the state.

Teachers will also be able to identify with the laboratory method of teaching as well charts and their corresponding effect of learners behavior. The researcher also hope that this work will provide all stake holders in the educational process, eth right information needed for them to appropriately.

Intervene to promote the teaching and learning of science subjects in senior secondary schools.

Scope and delimitation of the study

In order to successfully work with the limited time and available resources, the researchers focused on the problems militating against teaching and learning of science subjects in some selected senior secondary schools in Ovia North East area of Edo state.

This study is limited to solely Ovia North East local government area as a case study.

Definition of terms

Some terms that appear in this work are defined within the context of usage.

- Science: Science (from the Latin worci scientia, meaning “knowledge”) is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe .Wikipedia
- Science subjects: These are chemistry, physics, biology, mathematics, computer science.

- Laboratory: a room or building equipped for scientific experiments, research, or teaching, or for the manufacture of drugs or chemicals.
- SSS: senior secondary School
- NPE: National policy on Education.
- Teaching: The role played by a teacher to help students to acquire knowledge, competence or virtue Informally the role of teacher may be taken on by anyone. Wikipedia
- Learning: The acquisition of knowledge or skills through study, experience, or being taught.
- Militating: According to Oxford Dictionary, militating means the influence or effect towards something.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Literature review

This chapter reviews the literatures that are related to the study that is the works of other researchers about teaching and learning of science subjects and factors that affect it. These literatures will be reviewed under the following

Sub headings:

- Concept of science education.
- Relevance of science education.
- Science education policy in Nigeria.
- Concept of teaching.
- Concept of learning.
- Problems militating against the effective teaching and learning of science.
- Summary of review of literature review.

Concept of science education

Science which comprises of (chemistry, physics, biology, computer science, mathematics) is popular among senior secondary school students in Nigeria due to its nature. It addresses the needs of majority through its relevance and functionality in content, practice and application. What many nations like Nigeria need now is a functional science education that will assist in national development. Science education has been identified to be one of the major bedrock for the transformation of our national economy.

Science education is therefore the systematic process of acquiring the fundamental knowledge about the universe. With these indispensable knowledge richly acquired, man can shape and reshape his world for his benefit. Hence, the development of the nation is usually measured by the degree and extent of growth brought to it through the enterprise of science education and a gate way to it is studying the science subjects. Science subjects education is the vehicle through which science knowledge and skill reach the people who are in need of capacities and potentials

for development. In addition. Science education addresses the social objective of development as education is now of the primary means for empowerment, participation, cultural preservation, social mobility and equity (Emmanuel, 2013). The impact of science on the world involves the process of bringing manufacturing inventories and sculpturing, designing etc. Technology can be seen as the application of scientific knowledge, skills, work, attitudes, tools and equipment in evaluation of new processes and adoption of these processes to the production of goods and services for the benefit of mankind (Hornby, 2010).

Science education plays important role in enhancing the quality of teaching and research as well as ensuring that students are equipped with good knowledge to produce intensive goods and services to meet human needs for food, health care products and other materials aimed at improving the quality of life. Every single material thing in the universe is a material and the ability to understand and manipulate these materials is responsible for everything from modern food and drugs to plastics and computers. Conclusively, the ideas of science are not getting the attention they desire in either formal or informal educationa1 process. It is argued that an improvement in this position requires the further development of the nature and quality of science education to scientific and technological industries through intensive and extensive research.

Science subjects education is needed in the professional development of industries required in the establishment of modem technology and operation of these industries.

Relevance of science education

In recent years, many studies have been conducted and corresponding articles published that clearly present a rather a gloomy picture with respect to the learning of science, especially at the secondary school level. A key claim is that science education — particularly in physics and chemistry — remains unpopular among many students (Dillon, 2009; Gilbert, 2006; Hofstein, Eilks, & Bybee, 201 1; Holbrook, 2008; Osborne & Dillon, 2008).

Many publications emphasize the relevance of science education in order to maintain the economic wealth of modem societies, thereby justifying science skills among the young generation as essential for continued prosperity in our future (Bradley, 2005).

Science subjects learning becomes relevant education when the learning will have (positive) consequences for the student's life.

Positive consequences can be:

i. fulfilling the actual needs pertaining to the student's interests or educational requirements (that students will actually perceive), as well as

ii. anticipating future needs (that the students may not necessarily be aware of).

The relevance of science subjects education covers both intrinsic and extrinsic components. The intrinsic dimensions encompass student's interests and motives; the extrinsic dimension covers ethically justified expectations of the personal environment or from society at large towards the student.

Relevance can be considered as composed of different dimensions, an individual, a societal, and a vocational dimension. For science teaching this means that relevant science education contributes to students' intellectual skills development, promotes their competencies to participate in society today and in the future, and improves their vocational orientation and career choices. These

dimensions are:

- The individual dimension.
- The societal dimension.
- The vocational dimension.

The current book focuses on the relevance of science subjects teaching and learning. There is no doubt that science is economically and ecologically very important for sustaining our world and for every developed, emerging or less developed society (Bradley, 2005 ; Knamiller, 1994).

Science education policy in Nigeria

Science education according to Buseri (1995) is the application of educational (learning) theories especially those based on the philosophical, sociological and psychological perspectives in the endless search for knowledge, resulting in the development of the cognitive, affective and psychomotor domains through some systematic processes involving careful observation, deduction and testing by empirical means. According to OGkafors (2004) in pedagogical

literature, the main purpose of science education is to promote scientific and technological literacy which is to help individuals;

- Develop the ability to use scientific knowledge creatively in everyday life,
- Be familiar with some processes of science that are very useful in decision making and problem solving,
- Explain personal feelings in a constructive manner,
- Understand scientific issues involved in handling household technological devices,
- Make appropriate decisions that are related to health, Nutrition, environment, education and life styles,
- Develop sensitivity to, and respect for the feelings of other people
- Categorize the observable and unobservable universe into manageable units for study and u1timtely providing reasonable explanations for observed and unobserved relationships among others.
- Prepare learners in the several disciplines of science
- Provide the background required of individuals entering technological occupations or professions such as electronics medicine, engineering among others; and
- Providing background in science as part of the general education of the individual for effective citizenship.

The Nigerian government like all other government in the world realizes the role of science and its bye Product-technology in issues of national development. It is for this reason that their promotion is enshrined in section 18 of the 1999 Constitution of the Federal Republic of Nigeria.

The goals of science education in Nigeria according to the National Policy on Education (FRN;2004) are to:

- Cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy;'
- Produce scientists for national development,
- Service studies in technology and the cause of technological development;
- Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life.

Ataga (1997) in discussing the role of science in the development of a nation argued that Science gives man the power to foresee and judge the consequences of his own actions in reflection to the natural world in which he is. It is a social activity that serves human needs for it is a foundation for technology since it provides knowledge and technology provides a way of using

this knowledge.

It is sciences alone that can solve the problem of hunger and poverty, insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich

country inhabited by starving people. Who could afford to ignore science today? At every turn we have to seek its aid.

For instance, in view of the positive role of science and its bye-product technology in a country's national development effort, successive Nigerian governments have made remarkable efforts to inculcate in the citizenry the culture of science and technology, These efforts according to Ekpo (2007) are reflected in the following areas namely;

- Establishment of Nigerian Colleges of Art and Science
- Establishment of colleges of technology
- Establishment of special science primary and secondary schools
- Establishment of federal! state technical colleges
- Payment of special allowance for science teachers in secondary schools
- Establishment of technical colleges of education; and
- Establishment of universities of science and technology.

The National Policy on Education (FRN: 2004) on its part while emphasizing the place of science and technology for the country's developmental agenda states that "a greater proportion of expenditure on..education shall be devoted to science and technology". Accordingly, the

National Policy on Education (FRN: 2004) went on to assert that special provisions and incentives shall be made for the study of the sciences at each level of the national education system. For this purpose, the functions of all agencies involved in his promotion of the study of science shall be adequately supported by government and that: Government shall popularize the

study of the sciences and the production of adequate number of scientists to inspire and support national development.

As a way of putting the above intentions of the Nigerian government into reality, the National Policy on Education (FRN: 2004) states unequivocally that "not less than 60 percent of places shall be allocated to science and science oriented courses in the conventional universities and not less than 80 percent in the universities of technology? The reason for this is to launch Nigeria into the technological age so as to stimulate the development of the country through the exploitation of her natural resources with the help of knowledge got from science education.

Concept of teaching

Teaching is defined by many scholars of education as the promotion of learning. Teaching is the process by which a teacher guides the learners in the acquisition of knowledge, skills and attitudes. It is essentially a system of interactions involving the teacher, learner and learning materials. Also teaching is defined as an acting or set of activities carry out by a professional (the teacher) who has received the relevant and required training to take part in education process.

Adesina (1995) opined that education is the tool for integration of the individual effectively into a society so that the individual can achieve self-realization, develop national consciousness, promote unity and strive for social, economic, political, scientific, cultural and technological process.

Teaching therefore can be seen as the set of coordinated and carefully planned activities that are to be carried out by the teacher in order to realize or achieve the goals of the educational process. The primary purpose of the teaching and learning process is to bring permanent change in behavior that is for learners to:

- Have achieved specific ideas and skills superior to that which may have been acquired.
- Select the appropriate method (strategy and mode of presentation).

Abdulahi (1981) suggested that the teacher should put into consideration:

- Learners age
- Previous knowledge
- General ability
- Topic to be taught
- Ability of teachers to handle the method of instructions
- Time available
- Time of the day
- Size of the class
- Resources at disposal of teacher.

UNESCO (2005) emphasized that quality assurance is a powerful means that can improve the effectiveness of education. Its key principles is that the main actors of the forefront of education such as teachers, head teachers, e.t.c. are responsible for improving educational performance.

Pilot (2007) stress that empowering teachers is important for the realization and quality of both curriculum and educational innovations.

Antivirus (1992) noted in his study that the teaching profession is still in the process of building up a specialized and systematic education based on intellectual training. There is therefore the need to search for more effective chemistry teaching strategies or methods that will make impartation of knowledge of chemistry more interesting and enjoyable to students. Such methods include operative based learning instructional strategies (activity based) which have been found to improve science learning outcomes.

Okebukola (1984). For chemistry the frequent use of laboratory for learning will also make the educational process more fruitful.

Lecture method

James Micheal Lee in kochlar (1985) defined lecture method as a pedagogical method whereby the teacher formally delivers a carefully planned expository address on some particular topic or problem as stated earlier. It is a textbook control which is inflexible with little consideration given to the pupils abilities.

Advantages of lecture method

- In this teaching method a large amount the topics can be covered in a single class period.
- Using of this method exclude the using of any equipment or Lab.

- Learning material is not required.
- Student listening skills developed.

In spite of the few advantages there are many disadvantages which are:

- Psychologically this method is acceptable because individuals are not alike. Teacher delivers the same lecture to both students without recognizing the individual differences.
- Learning is an active process thus study should encourage to actively participate in the class room instead of just listening the teacher.
- Language using in the lecture is above the standard of the students. They are not able get full advantage of the lecture.
- Lecture are often forgotten by the students soon after while learning isretained if activities are experienced.
- Attention level is not the same while student listening the lecture.

It can be inferred from the above that the disadvantage outweighs the advantages when using lecture method to teach chemistry in senior secondary schools.

Activity - Based method

Activity based method is anything which is carried out with a purpose in a social environment involving physical and mental action. Such activities help in the establishment of stimulating environment for creative expression.

Kochiar (1985).

Advantages of activity based method

- Each child has its own speed to grasp things, activity based learning allows kid to learn fundamentals at their own speed.
- Horizon of learning is pretty wise, it facilitates learning in groups, and mutual learning. Also it has a place for self-learning.
- It allows teacher's to devote time to individual student needs.
- Since its activity based and kid is involved in the process — their participation allows them to pick fundamentals fast.
- There is no concept of unit test etc, Evaluation is inbuilt in the system which makes it quite child friendly.
- On completing the activity, child has a feeling of sense of accomplishment which boosts child's confidence.
- Games are needless to say create more buzz among children.
- Creative and communicative skills are bound to groom in this way of learning.
- There is feeling of interaction between teacher and the child, it helps in reducing the barrier between the two.

Disadvantages of activity based method

- It's important to learn facts right. If fundamentals and facts are not known, it doesn't help in arguments and debates.
- Same goes for learning any foreign language.

From the above it can be seen that the advantages are more than the disadvantages.

Laboratory method

Laboratory method is a form of activity method carried out by an individual or group for the purpose of making personal observations of process, products or events. Lab exercise have been as a means of:

- Verifying a principle, law or theory already known to students.
- Practicing one or more cognitive skills such as ability to observe, classify, measure and interpreted data.
- Obtaining and understanding specific knowledge.
- Determining the relationship between cause and effects.

Advantages of laboratory method

- Through this method, a science teacher can provide various kinds of learning experiences\to the students, as a result of which information gained by them turns out to be of permanent kind.
- In this method, individual differences and interest of all the students are taken into consideration, as a result of which, it is considered to be one of the psychological method of teaching.
- Through this method, students learn to explore various things on their own. They also learn to verify various scientific facts and principles. Such students become able to solve

out various kinds of problems arising in their life own their own, as they possess of high level of self-confidence.

As the students directly get indulged in the experimental functions and handle the various complex instruments themselves, thus various kinds of practical skills and proficiency get developed in them to considerable extent, with the help of which they prove to be successful in earning their livelihood in the future.

Through this method, an intimate relationship got developed in between the students and teacher, as students are required to acquire necessary guidance for performing practical work from the teacher while the teacher provides proper individual attention to them, by which all of them come closer to each other.

- With this method, teacher can develop various good habits among the students because of which it is known for inculcation of good virtues among the students by a majority of experts.
- When students get success in their experimental work, then they attain a sense of achievement, which helps them in improving their performance to considerable extent in all spheres of life.

Despite these noteworthy advantages of the laboratory method, one major setback of the method is the scarcity of well- equipped laboratory in school partly due to failure of school to provide the equipment and partly due to insufficient funds allocated to the schools in the state.

Concept of learning

Learning involves mental process, acquisition of some skills an competencies which must be relatively permanent within the cognitive abilities; of the learners. These skills may be acquired in formal learning environment or an informal learning or training environment. The latter explains a situation in which people acquire knowledge through direct and indirect contact with various forms of mass media like newspaper, television, etc. (www. Webpages Vidaho.edu/mboli&isiponah1)

Oje and Babalola (2000) define learning as the mental activity by which knowledge and skills, habits and attitudes, virtues and ideas are acquired, retained and utilized resulting in the progressive adaptation and medication of conduct and behavior.

It is important to know that the process of learning is usually enhanced through the various learning resources used by undergraduate students in higher institution of learning. Learning resources are information represented and stored in variety of media a and formats that assist students learning as defined by provincial or local curricula,

Theories of learning

Learning theories are conceptual frameworks desirably how information is absorbed, processed and retained during learning (Wikipedia).

The following theories have been discussed extensively in many literatures and they are:

- Behaviorism

- Cognitivism
- Constructivism
- Design based! multimedia learning
- Humanism.

However for the purpose of this study, the researcher, will base more on behaviorism and cognitivjsm theories of learning.

- Behaviorism: behaviorism is a world view that operates on a principle of stimu1usresponse All behavior caused by external stimuli (operant conditioning) and all behavior can be explained without mental states or consciousness. Major originators and contributors of this theory include John B. Watson, Ivan Pavlov, B.F. Skinner, E. L. Thorndike, Bandura, Tolman and others.

Experiments by behaviorists identify conditioning as a universal learning process. There are two different types of conditioning, each yielding a different behavioral pattern:

Classic conditioning occurs when a natural reflex responds to a stimulus.

We are biologically “wired” so that a certain stimulus will produce a specific response. One of the more common examples of classical conditioning in the educational environment is in situations where students exhibit irrational fears and anxieties like fear of failure, fear of public speaking and general school phobia.

- Behavioral or operant conditioning occurs when a response to a stimulus is reinforced. Basically, operant conditioning is a simple feedback system: If a reward or reinforcement follows the response to a stimulus, then the response becomes more probable in the future. For example, leading behaviorist B.F. Skinner used reinforcement techniques to teach pigeons to dance and bowl a ball in a mini-alley.

This theory is relatively simple to understand because it relies only on observable behavior and describes several universal laws of behavior. Its positive and negative reinforcement techniques can be very effective— such as in treatments for human disorders including autism, anxiety disorders and antisocial behavior. Behaviorism is often used by teachers who reward or punish student behaviors.

. Cognitivism: during the 1970's, conception and definition of learning began to change dramatically. Behavioral theories gave way to cognitive theories that focused on mental activities and the understanding of complex materials. An information processing metaphor replaced the stimuli- response framework of behavioral theories. A few of the -cognitivisms who have contributed to developing the cognitive theory are the following: Piaget, Bloom, Bruner.

The learners according to cognitivisms are active participants in the learning process. They use various strategies to process and construct their personal understanding of the content to which they are exposed. Students are not considered anymore as recipients that teachers fill with knowledge, but as active participants in the learning.

Problems militating against the effective teaching and learning of science subjects in senior secondary schools Seweje and others (2002) described teaching as a cluster of activities which involve imparting knowledge, attending to and organizing learning outcomes, preparation of lesson plans, evaluating learning outcomes, general supervision and guidance, classroom mgt, keeping school records, etc.

There are various challenges facing the teaching and learning of science subjects in the secondary schools of Ovia North East Area of Edo state. Some of these problems includes:

- Availability of qualified manpower such as teachers to teach the subject.
- Availability of science laboratory and laboratory equipment in secondary schools.
- Poor methods of instructions.
- Attitude and interest of learners.
- Availability of trained and qualified manpower such as teachers to teach the subject: the shortage of professionally and qualified teachers in the secondary schools has been denied over the years by the government. To solve this problem, the federal government of Nigeria in 1997 NPE declared that teacher education will continue to be given a major in all our educational system which can raise the quality of teachers.

Kwache (2007) remarked that most schools lack professional! Qualified science subjects teachers and experts that would support and manage the application of computing in the teaching and learning process. For effective teaching and learning to take place, there must be well qualified and competent teachers who will handle and teach the students effectively.

Oyebsnji (2003) stated that the performance of students depends to a large extent on the competence of the teachers. Science subjects education contributes to the objectives of self-realization of an individual. Works offered in science enables students to improve their abilities to solve world problems.

Lack of sufficient practically orientated teachers who would arouse and sustain students interest is a serious setback in the progress of science subjects as fields of study.

To salvage the shortage of professionally trained and qualified teachers; Aluyi (1980) suggest that teacher education should embrace the production of highly motivated and efficient classroom teachers for all levels of educational system. He further explained that teacher education should be geared towards providing the teacher with intellectual and professional background adequate for their assignment so the final product would be "model teaching" properly trained and fit for teaching in this 21st century.

- Availability of science laboratory and laboratory equipment in senior secondary school: the instructional material for senior school science subject involve textbook, lab manual, CD's and other multimedia.

However for science subjects as subjects, the availability of a working labs that is well equipped is of utmost priority in teaching and learning science subjects.

Ikemenjima (2005), Jegede and owulabi (2008) noted that there are infrastructural deficiencies and shortage of facilities including science subjects laboratory, laboratory equipment, apparatus, charts, organisms, computers, e.t.c.. It means that most senior secondary schools in Ovia North East do not have science subjects laboratory and those that have are not fully equipped. It is

noteworthy that teaching and learning materials should be relevant to the learning needs of the student if not the main objective of learning would be defeated. Therefore for students to fully understand or learn science concepts, the use of laboratory and laboratory equipment is inevitable.

Government at all levels should improve on the funds to education a so that science subjects laboratory can be acquired and state of the art equipment set up in the schools for effective teaching and learning science subjects in senior secondary schools.

- Attitude and interest of learners: the importance of interest in teaching and learning is very pivotal in the educational process. Educational psychologists have found out based on research that students learn effectively when they are interested in what they are being taught. Croojal (1969) observed that students remember and pay attention to what interests them and discards or soon forget what doesn't interest. With this effect, the use of the laboratory, charts and life example can help capture the students interest in effectively teaching and learning science subjects.
- Poor method of instructions: The science subjects appears abstract to many students. To make it real and close to the students, the methods used in teaching it matters. The

teaching and learning of science subjects should be activity- based so that students will be actively involved. By this, the subjects becomes real to majority of teachers teaching science subjects are not current with the many methods of teaching science subjects. The majority of teachers who have been employed in the past decades have been doing the same thing the same way all along. They strategies that can be used in the science subjects classroom include, game playing, project demonstration, discovery brainstorming, problem solving method and process based approach These develop in students critical thinking skills, creativity, open mindedness, intellectual honesty e.t.c. another factor that lead poor method of instruction is the employment of non-professional qualified teachers that is teacher who teaches Science subjects but has no teaching qualification. Such teachers may not be knowledgeable in teaching methods suitable to learn science subjects effectively not to talk of being abreast with the use of instructional material to teach science subjects.

- School type: School type maybe either single sex school or mixed sex school. In mixed sex schools, gender disparity is very common among teachers and students but in single sex schools gender disparity is not practiced due to the fact that only one sex attends the school so teaching and learning of science is more effective in single sex schools. In mixed sex schools, the teachers often times Favour one sex over the other as well as students favoring teachers of a particular gender over the other.
- School ownership: This can either be private owned school or government owned school. In public schools, there are well equipped n science laboratory but due to high population

of students, they are hardly taught in the laboratory. In some private schools, there are science laboratory which is hardly well equipped and sometimes students are taught in the laboratory due to the minute population. School governing board for public schools do not provide sufficient funds to get well equipped laboratory.

Summary of review of related literature

Jegede and Owulabi (2003) in their study found out that there is a wide gab between the Nigeria education policies and the corresponding implementation processes.

According to Akale in National Teacher Institute, NTI, (2002), stated that teachers are the most important resources in educational programs. To ensure that the best possible quality in the teaching workforce, the policies implemented by government must take into consideration the interplay of certain critical variables that influences teacher's career such as pre service training, recruitment policies, remuneration and continuing educational programme. Teachers should be given both local and international scholarship to upgrade and update their knowledge and skills in order to influence changes in education. They should be encouraged to further the spirit of enquiry and creativity and assisted to fit into the social life of the community and society at large

Some factors have been identified by scholars to have directly affect the teaching and learning process. However, narrowing these factors down to science subjects as a broad term will be attempted in this study.

to upgrade and update their knowledge and skills in order to influence changes

CHAPTER THREE

Research Methodology

This chapter presents the methodology used for this study.It specifically discuss the following.

- Research design
- Area of study
- Population of the study
- Sample and sampling techniques
- Instrument for data collection
- Validation of the instrument
- Method of data collection

Research design: The research design that wil be used for the study is survey research design.survey research is a quantitative research method used for collecting and analyzing data from a set of panel or respondents considered to be a representative of the entire group.

Area of study: The study area is Ovia North East local Government Area of Edo state. Ovia North East Local Government Area has thirty six(36) senior secondary schools.

Population of the study: The population of the study comprises four thousand eight hundred and six(4806) senior secondary school students out of which one thousand five hundred and seven(1507) are science students.

Sample and Sampling Techniques: A sample of 5 schools was randomly selected from 36 senior secondary schools. The five schools included three public schools and two private schools. Ten (10) students were randomly selected from the five senior secondary schools . This will sum up to 50 respondents.

Instrument for data collection: The instrument for data collection for this study is a researcher-developed questionnaires, tagged problems militating against Effective Teaching and learning of science subjects In senior secondary Questionnaires(MAETLSQ) was used for data collection. The questionnaires has two sections, A and B. Section A sought demographic information of respondents i.e. name of school, sex, current class, while section (B) consists / contain 5 items which elicit information on problems Militating Against Effective Teaching and Learning of Science Subjects In Senior Secondary Schools. The instrument was weigh on a (A) point rating scale for the respondents to make their responses as follows: Agree (A) , and Disagree (D).

Validation of the instrument: The content and face validaty of the instrument were carried out. To ascertain to the project supervisor along with the research questions, bearing in mind the purpose of the study. The comments, suggestions and corrections were accommodated and used to modify the instrument.

Method of data collection: The direct delivery and retrieved on the spot by the researcher.

Method of data analysis: Data collected were analysis using simple percentages.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

DATA PRESENTATION

This chapter contains the presentation, analyses ,interpretation of the data colleted for this research work and discussion of findings.

TABLE 1

Statistical result for sex, schools and currents class.

Sex		Current Classs		
Male	Female	S.S.1	S.S.2	S.S. 3
19 (38%)	31 (62%)	12 (24%)	19 (38%)	(38%)

From the table above 38% of the respondents are male while 63% are female. 24% of the respondents are in S.S.1, 38% are in SS2 and SS3 respectively.

Table 2

Research Question one

Are there qualified teachers to teach the subjects?

S/N	ITEMS	A	Percentage	D	Percentage
1	My school has qualified teachers to teach all science subjects	35	72%	15	28%
2	My teachers are skilled in using lab equipment to teach the science subjects	29	58%	21	42%
3	Science subject's teachers in my school are re-trained and updated in the subjects at intervals.	18	36%	32	64%
4	My science subjects teachers makes science interesting to learn.	31	60%	20	40%

From the table 2, 72% of respondents believe that teachers in their schools are qualified teachers while 28% disagreed. 58% agreed that teachers in their schools are skilled while 42% disagreed. 36% of the population agreed that science subjects teachers in their respective schools are re-

trained and updated regularly, while 64% disagreed. 60% of the respondents agreed that science teachers makes in their respective school make science subjects interesting while 40% disagreed

Table 3

Research Question Two

Are there good instructional material for teaching the subject

S/N	ITEMS	A	Percentage	D	Percentage
5	My school has science subjects labs with major lab equipment	27	54%	23	46%
6	Ther are chart such as periodic table charts, skeletal structure, computers, e.t.c to teach science subjects in my school	35	70%	15	30%
7	Science subjects text books are available in my school	42	84%	8	16%
8	Equipment in the lab are at functioning capacity	29	58%	21	42%

From the table above 54% of the population agreed that their respective schools has major lab equipment while 46% disagreed. 70% of the respondents agreed that there are chart such as periodic table, skeletal structures are available in their respective schools, while 30% agreed.

84% of the respondents agreed that science subjects texts books are available in their school, while 16% of the population disagreed. 58% of the respondents agreed that there are lab equipment in the school lab.

Table 4

Research Question Three

S/N	ITEMS	A	Percentage	D	Percentage
9	There are well- equipped science subjects lab in my school	30	60%	20	40%
10	My science subjects teachers uses the lab in teaching science subjects from time to time	32	64%	20	40%
11	My science subjects teachers explained how to uses the equipment in the lab during practical	34	68%	18	36%
12	My science subjects teachers supervises us during practical	35	70%	15	30%

The table above showed that 60% of the population agreed that there are well- equip science lab in their respective schools. It is also discosed from the above table that 64% of the respondents agreed that science subjects teachers explained to the students how to use the lab during practical,

while 32% disagreed. 70% of the entire population opined that science subjects teachers supervises them during practicals.

Table 5

Research Question Four

Does school type affect effective teaching and learning of science subjects?

S/N	ITEMS	A	Percentage	D	Percentage
13	My school is a mixed sex school	35	70%	15	30%
14	My school is a single sex school	15	30%	35	70%
15	My science subjects teachers teach effectively irrespective of the school type	43	86%	7	14%
16	My science has both sex teachers are not gender stereotyped	39	78%	11	22%
17	My school has both sex	35	70%	15	30%

	teachers to teach us science and to avoid gender disparity				

From table 5, 70% of the respondents agreed that they attend mixed school while 30% do not agreed. 30% of the total population agreed that they attend single sex school while 70% disagreed. The table also disclose that 86% of the respondents opined that science subjects teacher teach effectively irrespective of the school type, while 14% disagreed. 78% of the respondents agreed that science subject teacher are not gender stereotyped while 22% of the population disagreed. 70% of the population agreed that both sex teachers to teach us science and to avoid gender disparity, while 30% disagreed.

Table 6

Research Question Five

Does school ownership affect the effective teaching and learning of science subjects?

S/N	ITEMS	A	Percentage	D	Percentage
18	My school is a public school	25	50%	25	50%
19	My school is a privately owned school	28	58%	21	42%
20	The governing board of my school makes	39	78%	11	22%

	sure there are well qualified science subject teachers				
21	The governing provides well equipped and capacity working science laboratory	29	58%	21	42%

Table 6 review that 50%of the respondents agreed that they attend public schools while 50% disagreed. 58% agreed that they attend privately owned school while 42% disagreed. 78% of the population opined that governing board of their respective schools ensure that the schools have qualified science subjects teachers, while 22% disagreed. Finally 58% of the respondents believed that governing board of their respective school provide well equipped and capacity working science laboratory, while 42% disagreed.

DISCUSSION OF THE FINDINGS

From table 2, based on the findings larger percentage of the respondents agreed that most senior secondary schools in Ovia North east local Government area of Edo have qualified teachers. One can assume that public and private schools qualified. They might be trained in a particular filed but not all are qualified.This is in line with academic qualification, while a trained teacher is one who has completed the minimum organized teacher training requirements(whether during pre-service training or in- service).

In some countries teachers need to have a Master's Degree in order to teach More importantly, there is a lot of variability in the design of teacher programs. Teachers training programs can

range from 12 months to 4 years. They can include a practical component(e,g, field experience) either concurrently during course works or after all course work is completed.

From table 3, it is obvious that there are instructional materials in public and private schools in Ovia North East Local Government Area of Edo State. It is necessary to draw the line between availability and utilization. Materials might be available but sometimes students don't make use of these materials.According to Ikemenjima(2005), Jegede and owulabi(2008) noted that even though there are instructional materials available some public schools they are not fully equipped. It is noteworthy that teaching and learning materials should be relevant to the learning needs of the students if not the main objectives of learning would be defeated. Therefore for students to fully understand or learn science concepts, the use of laboratory and laboratory equipment is inevitable.One can conclude that from table 4, based on the findings, students are practically taught science subject in the science laboratory. Most schools have science but often time students are not practical taught science subjects in the lab.

From table five, one can conclude that school types can affect learning of science subjects in both public and private schools in ovia north east local government of edo state. In mixed school most at times there is gender disparity from the teacher to students, but in single this is completely not existence.

From table six, based on the findings, one can conclude that school ownership affect the effective teaching and learning science subjects'. The government board od most public school

do not provide enough funds for equipping the laboratory hence impending the effective teaching and learning of science subjects

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

In this chapter, the researcher presents the summary of the study, conclusion and recommendation for further research.

SUMMARY:

The study examined the problems militating against effective teaching and learning of science subjects in senior secondary school in Ovia North East Local government Area of Edo State. A survey research design which involves the collection and analysis of data through the use of questionnaire was adopted to solicit information. Five (5) research questions were used for this study. The population of the study comprised of the students of Ovia North East Local Government area of Edo State. The sample of study compromised of ten (10) students each from five (5) randomly selected schools.

FINDING:

- Most schools have science subjects teachers
- Some schools have equipped science laboratories

- Most science subjects teachers are not trained and updated in the use of laboratory equipment.
- Most public schools do not have well equipped science laboratory to teach science.
- School types affects effective teaching and learning of science subjects

CONCLUSION

This study has been able to show the problems militating against effective teaching and learning of science subjects. It is therefore very important for the school board to curb these problems and find effective solutions. The presence of these problems causes inactive participating of the students towards learning science subjects inadvertedly making them incapable of applying scientific knowledge to real life situation.

RECOMMENDATION

Based on the finding of the study and in order to solve these problems mentioned above, the researcher made the following recommendation;

- The government should promote science by providing well equipped science laboratories to efficiently teach science subjects in senior secondary schools.
- The science teachers should be trained and updated in the use of laboratory equipment in teaching science subjects.

- The school board endeavor to employ well qualified teachers in the science field to teach science subjects
- The science teachers should use instructional materials to captivate the interest of learners
- The school board should employ science teachers of both sex so as to avoid gender disparity of science student.
- The science subject teachers use the lab and lab equipment in teaching to enhance student ability to apply knowledge gain in real life situation.

SUBGESSION OF FURTHER STUDIES

- This research work can be carried out in other local government and state around the federation to find out whether the finding will be the same
- This research can also be carried out in other basic science subject in junior secondary school.

LIMITATION OF STUDY

The study has great short comings such as shortage of current literature, fake responses from students and few schools were covered by the researcher due to financial constrain and time factors.

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