THE INFLUENCE OF TEACHING METHOD ON THE ACADEMIC ACHIEVEMENT OF

STUDENT STUDYING BASIC SCIENCE IN JUNIOR SECONDARY SCHOOLS

IN EGOR LOCAL GOVERNMENT AREA

BY

ADOGBEJI SANCO ONOME

EDU1001540

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

BENIN CITY

DECEMBER, 2014.

THE INFLUENCE OF TEACHING METHOD ON THE ACADEMIC ACHIEVEMENT OF STUDENT STUDYING BASIC SCIENCE IN JUNIOR SECONDARY SCHOOLS IN EGOR LOCAL GOVERNMENT AREA

BY

ADOGBEJI SANCO ONOME

EDU1001540

A RESEARCH PROJECT SUBMITTED TO THE FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE AWARD OF B.SC (ED) IN INTEGRATED SCIENCE

DECEMBER, 2014.

CERTIFICATION

We the undersigned certify that this project work was carried out by ADOGBEJI SANCO ONOME in the Department of Educational Psychology and Curriculum Studies, is adequate in scope and quality for the partial fulfillment of the award of Bachelor of Science Education B.Sc (ED) degree in Integrated Science.

DR. (Mrs.) MUSA R. J.
Project supervisor

Date: 19/12/14

Mrs. Y.O OSUNDE
Project Co-ordinator

Date: 22/12/14

PROF (Mrs.) L.I. SALAMI
Dean, Faculty of Education

Date: ----------

DEDICATION

This project is dedicated to the Jehovah God whose love, infinite mercies and grace has been the source of my strength. Without Him, all my work would have amounted to nothing.

ACKNOWLEDGEMENT

My sincere appreciation to my Mr. Olomu James and Mrs. Adogbeji Maria for their unimaginable, invaluable financial support. I sincerely want to give special thanks to my mother for all her efforts.

I want to acknowledge my project supervisor, Dr. (Mrs) Musa for the guidance and encouragement she gave me all through the period of this study. My thanks also go to Mr. Ogumogu Excellent for his constant advice. I also wish to thank all lecturers of the department of educational psychology and curriculum studies who have impacted in me academically and morally.

I also wish to acknowledge my friends Owhetta Hosea, Esiwo, Natheniel, Gladys, Amara, Tina, Chibuzor, Frank, Bro James, Joy, Bro Ebuchilem, Sis Ovoke and all others for their support and friendship which has helped me in becoming a better person. There aren't enough words to express my appreciation to everyone who has motivated me academically.

TABLE OF CONTENTS

ABSTRACT

The study investigated the influence of teaching method on the academic achievement of student studying basic science in junior secondary schools in Egor Local Government Area, Edo State.

The population of the study was made up of two hundred (200) junior secondary school students and twenty (20) teachers. Ninety (90) students and eight (8) teachers were randomly selected by simple random sampling from three secondary schools. The instrument used for the study was questionnaires. The data collected were analyzed using simple percentage and frequency count.

The result showed that most of the secondary schools surveyed don't have good laboratory facilities. Students preferred few class members as this situation helps them learn better during classroom lessons.And inappropriate application of teaching method negatively affects students' academic performance.

Therefore, the researcher recommended that Governments should be implored to give enough grants to equip laboratories with chemicals and apparatus, and also to provide useful materials and appropriate teaching. Also, more adequate classroom should be created with few students and Teachers should be encouraged to attend workshops and seminars to improve on their existing quality and effectiveness.

CHAPTER ONE

INTRODUCTION

Background of the Study

Science is an activity oriented subject. The way it is taught is important in helping students acquire basic scientific knowledge, skills and attitude in solving different problems of life. Basic science being a science subject, therefore, gives the teacher opportunity in using methods that will directly make the students actively involved during instruction.

It is true that what students learn is greatly influenced by how they are taught. Teaching and learning are the two sides of a coin. The most accepted criterion for measuring good teaching is the amount of learning that occurs. The primary purpose of teaching at any level of education is to bring a fundamental change in the learner (Tebabal and Kahssay, 2011). To facilitate the process of knowledge transmission, teachers should apply appropriate teaching method that best suit specific objectives in order to help students learn to solve problems, develop mature judgment, enhance communication skills and retain reliable information.

Teaching methods must be adequately refined in order to help reflect a modern society mandating the need for functioning, thinking –oriented, decision-making students, especially when dealing with subjects like basic science, which

comprises of a body of empirical, theoretical and practical knowledge about the natural world produced by researchers, making use of scientific processes, which emphasizes the observation, explanation and production of real world phenomenon by experiment. Therefore, the selection of an appropriate teaching method is important to be successful in the teaching and learning process. To be successful, teachers should select and use a wide variety of teaching strategies that take recognition of the magnitude and complexity of the concept to be covered.

Quite remarkably, regular poor academic performances by the majority students are fundamentally linked to application of ineffective teaching methods by teachers to impact knowledge to learners (Adunola, 2011). To avoid problems associated with using a particular method, there is need to search for alternative strategies more suitable and efficient for promoting the level of achievement and retention in teaching secondary school Basic Science beyond contemporary limits and to the satisfaction of the current Basic Science Curriculum requirements.

In teaching Basic Science, therefore, learners should be exposed to those processes that will make them identify the major differences among information, knowledge and reality. Learners gain knowledge when they process appropriate information given to them, information does not become knowledge automatically, rather learners must be actively involved in its processing (Akinlaye , 2010).

Furthermore, instructors should note that the success on the type of teaching method used is dependent on the intelligent analysis of the educational purposes, the students in the class, the curriculum contents of the moment or the

type of subject matter being taught. The methods and approaches have relative effectiveness on different individuals, and level of processing information. It is therefore necessary for teachers to choose the best method or approach that best suit his class at a particular time. By understanding and applying different teaching method, the instructor is sure to achieve his objectives and then understand the intelligent quotient (IQ) level of his class; this also influences his choice of informative teaching aids, etc. Obilo (2001).

Statement of Problem

Many methods of teaching exist in education. All the strategies are meant to make teachers succeed in their bid to disseminate knowledge and ensure learning. However, little consideration is given to some factors that are necessary before selecting an appropriate method of teaching. In fact, laudable as the subject Basic Science, it is beset with many problems. One of the major problems militating against its assimilation is the ineffective method employed in teaching Basic Science in most of our Junior Secondary Schools. It is true that the effective performance of a broad base subject as Basic Science is a function of many variables. This includes; supply of funds, availability of qualified teachers, infrastructural facilities such as laboratories, library, classrooms, equipment and instructional materials. The availability of these variables determines to a large extent the method a teacher will employ when teaching Basic Science. The absence of these, however, has contributed to selection of inadequate teaching method leading to the poor performance of students, which eventually lowers their academic achievement.

Purpose of the Study

The purpose of the study is to:

1. Find out if laboratory facility and equipment affect the selection of adequate teaching method.
2. Find out if the size of the class affects the use of teaching methods.
3. Explore the opinion of students about the influence the selected teaching method use by their teacher had on them.
4. Know the situation that compels teachers' selection of teaching method.
5. Find out the reason for perceiving any teaching method as the interesting and best method, and then provide suggestion for improving the quality of teaching and learning of Basic Science.

Research Questions

The following research questions have been formulated to guide this study;

1. Does lack of laboratory facility and equipment affect the selection of adequate teaching method?
2. Does the class size affect the use of teaching methods?
3. Does the teacher's year of experience affect the proper usage and implementation of different teaching method?
4. Does the teaching method used have a direct impact on students' academic achievement?

Significant of the Study

With the proper administration of teaching method when teaching Basic Science, students will be able to acquire basic scientific skills, which will definitely improve their educational achievement. Hence, the findings of this study, if properly

utilized will be of benefit to the teacher, students and of course curriculum planners.

This study will help the student who has lost hope in doing well in Basic Science that all hope is not lost as they can still understand the subject as improvement will be done in respect to the teaching strategies used by their teachers. The teacher will benefit since the study will help them to understand the appropriate method of teaching to be employed in carrying out their duties. The curriculum planners will get useful information that will enable them improve on planning the curriculum.

The overall significance is that when all the stakeholders in this study benefit from the findings, the learning of Basic Science will be very enjoyable and the student will perform better in both internal and external examinations.

Scope of the Study/Limitation

The study concerns itself with the influence teaching method has on junior secondary school students' achievement in Basic Science, while it will be carried out in Egor L.G.A. of Edo State. Although this study is meant for all students in Egor L.G.A., however due to time, fund and resources, the research will only be limited to some selected Secondary Schools in Egor L.G.A. of Edo State.

Definition of Terms

Teaching methods – Teaching method has been defined as procedures or orderliness or ways a teacher delivers his subject matter to the learners.

Academic achievement – it refers to students' performance and level of attainment during or after the course of a program

Methods –A way of doing something, especially a systematic way, it implies an orderly, logical arrangement (usually a sequential step).

Science – A body of knowledge which has been acquired through experimentation. It is a systematic body of facts based on experimental evidence in order to established laws and theories.

Influence – To have an effect on a particular situation and the way it develops.

CHAPTER TWO

LITERATURE REVIEW

Introduction

According to Ayeni (2011), teaching is a continuous process that involves bringing about desirable changes in learners through use of appropriate methods. Adunola (2011), indicated that in order to bring desirable changes in students, teaching methods used by educators should be best for the subject matter. Furthermore, teaching methods work effectively mainly if they suit learners' needs since every learner interprets and responds to questions in a unique way (Chang, 2010). As such, alignment of teaching methods with students' needs and learning influence students' academic attainments (Collins & Robert, 2004).

These sub- headings will be considered under this chapter:

1. Historical Development of Basic Science.
2. Basic Science And Technology Curriculum
3. Methods of Teaching Science.
4. Factors to Consider Before Considering any Teaching Method.
5. Research into Quality Teaching and Learning of Science.
6. An Inquiry Approach in Teaching and Learning of Science.

Historical Development of Basic Science in Nigeria

In Nigeria, science was offered at the lower forms as General Science, it was observed by the committee that there was need for a course that will provide adequate foundation for the proposed syllabus. Due to the intensity of the wave

of integration in science at that time, members of the committee decided to develop a totally new science program; the Basic Science Program developed for the lower forms and supported by the Ford Foundation through CESAC (Comparative Education Study and Adaptation Centre) was then being tried out in pilot schools. The Nigerian Integrated Science was seen as the course to provide the needed foundation at the lower secondary schools In Nigeria.

This effort at integrating the sciences in Nigeria began in January 1970. Representatives of the various subjects committees were elected to form an Integrated Science Curriculum Development Committee. The committee in January 1970, published the Curriculum Development Newsletter No.1. This document contains the philosophy, methodology, content and evaluation of a two year integrated science program. This exercise gave "birth" to the NISP (Nigerian Integrated Science Project) alongside the publication of supporting text material such as text books, workbooks, and teacher's guide. This integrated science project came into use in Nigerian schools in 1972, and was built around the themes: life, energy and matter.

With the advent of the National Policy on Education (1981) and the subsequent introduction of a two-tier secondary education, the Integrated Science Curriculum was redesigned which upgraded the curriculum to a three year program. Ajagun (1990) was of the view that the problem of Integrated Science can be solved or at least minimized significantly by changing the method of teaching the subject. Literature also shows that science processes are hardly assessed in the Nigerian Secondary Schools (Offorma, 2005). The fundamental aim of Nigerian Integrated Science Project which is a process – oriented

curriculum is to develop in student‘s science process skills. Though the curriculum specifies, hands on process and skill acquisition, most children are not exposed to these real situation in the schools. This means that scientific, vocational and technological aspects of education are not effectively implemented. Hence, curriculum reviews to make it relevant to national developmentin line with the global and national demand of this era.

Curriculum review became imperative as a result of Federal Government of Nigeria decision to introduce the 9 years of Basic Education and the need to attain the Millennium Development Goals (MDGS) by the year 2015 together with the need to meet the critical targets of the National Economic Empowerment and Development Strategies (NEEDS) summarized as follows: value re-orientation, poverty eradication, job creation, wealth generation and using education to empower the people. It became obvious that the existing curriculum for JSS should be reviewed, re-structured and realigned to fit into a 9 – year of Basic Education. The NCE (National Council on Education) also approved the new curriculum as Basic Education Curricula. Consequently, a high level policy committee on curriculum development met and produced the guidelines for the curricula re-structuring (Duada and Udofia, 2010). When this was done, Nigerian Educational Research and Development Council (NERDC) convened between January and March 2006 experts from various field and works of life who worked assiduously to produce the curricula. These curricula were to take effect from September 2007. In the restructuring, Basic Science replaced Integrated Science.

Basic Science and Technology Curriculum

Basic Science properly evolved from Integrated Science. Therefore, some relevant themes in Integrated Science Curriculum were maintained in Basic Science Curriculum.

Integrated Science is Science presented to the child such that the child gains the concept of the fundamental unity of science, the commonality of approach to problems of scientific nature and an understanding of the role and function of science in everyday life and the world in which they live (Federal Ministry of Education, FME 1985). Basic Science on the other hand is basic training and scientific skills required for human survival, sustainable development and societal transformation. Basic Science combines science and technology.

In the Nigerian education continuum, basic education as the foundation requires a sound knowledge of Science and Technology. This is not only because Science and Technology has a tremendous impact on all social institutions but also because science teaching is virtually non-existent in our primary schools (Danmole, 1998). The 9 years Basic Science and Technology Curriculum is a restructuring and re-alignment of the revised Core Curriculum for Primary Science and the Integrated Science for Junior Secondary Schools.

In the selection of content, Globalization, Information and Communication Technology (ICT) and Entrepreneurship were three major issues considered to be crucial in the development of the child, important in nation worldwide and influencing the contemporary world of knowledge. In the aspiration for identification with contemporary development globally, it has become inevitable for Nigeria to incorporate relevant content into the school curriculum. Hence,

four new areas approved for the Science and Technology Basic Education Curriculum are:

1. Environmental Education
2. Drug Abuse Education (DAE)
3. Population and Family Life Education POP/FLEE
4. Sexually Transmitted Infections (STIs) e.g., HIV/AIDS

These have been infused into every class of Basic 1-9 also Introductory Technology has been introduced at the lower and Middle Basic levels. The objectives of the new Basic Education Curriculum in Science and Technology are also spelt out thus to enable the learner:

1. Develop interest in science and technology
2. Apply their basic knowledge and skills in science and technology to meet societal needs
3. Take advantage of the numerous career opportunities offered by the study of science and technology and;
4. Become prepared for further studies in science and technology

It is noteworthy that Basic Science and Technology offered at the lower and Middle Basic Education levels is separated at the Upper Basic Education level (JS1-JS3) to provide students with appropriate experiences in science and technology in order to achieve the objectives of the Science and Technology Curriculum. The overall goal is to ensure the development of survival strategies by learners to live effectively within the global community. Knowledge, skills and attitudinal requirements are addressed under these four themes:

1. You and environment
2. Living and non-living things
3. You and technology
4. You and energy.

Methods of Teaching Science

Teaching methods need to be improved and appropriate teaching strategies employed, as the teaching- learning situation may demand. Teaching methods such as inquiry, project, lecture-demonstration, lecture performance, problem-solving, field trips, cooperative or group learning, excursion, remedial, laboratory and guided discussion and the use of audio-visual materials have been recommended for the teaching of science in schools (Mcdonald and Nelson, 1954; Webb, 1982; Rogus, 1985; Adedoyin, 1990; Ajewole, 1991). There is however the need to understand that for different topics in science, the teaching approaches may differ depending on the complexity and structure of the topics. Teachers should be concerned with the use of variety of methods and procedures. The most enjoyable aspect of teaching and learning can occur when a variety of teaching methods are used. In classroom around the world, teachers lecture, students take notes, and then students are tested on what they have learned. Today, experiential or “hands-on” learning is fast replacing or supplementing the traditional “chalk-talks”. Through experiments, simulations, debate, and other participatory activities, students discover concepts on their own.

Experiential learning increases retention, motivates students to learn and encourages group cooperation. The Project method of teaching involves assigning a particular work to student or group of students to work on and complete at

his/her/their spare time and report back to the teacher as when demanded. The project method provides an excellent opportunity for the complete act of thinking by the students. Rogus (1985) saw it as a means of teaching the students self-discipline. In project method students have occasion to define the problem, plan his work, find appropriate resources, carry out his plan and draw conclusion. Inquiry is a style or method of teaching where the learner with minimum guidance from the teacher seeks to discover and create answers to a recognized problem through procedure of making a diligent search (Callahan and Clark, 1977; Adedoyin, 1990).

Factors to Consider Before Considering any Teaching Method

As stated by Adunola (2011) before selecting a method, approach or technique for teaching in integrated science, the teacher should consider the following:

a. The Method must be right for the Learners
b. Suitability of the method for topic under discourse
c. Competence of the teacher to use his/her chosen selected method
d. Size of the class
e. Resources available for instruction and teaching e.g. laboratory, library, computer, models, charts, regalia, etc.
f. Time when lesson or topic will be taught (morning, afternoon or evening).

The Method must be right for the Learners: Some teachers consider the selection of method as an area where they have exclusive monopoly. This conception is wrong as their selection of method would affect their learners.

Learners' interest, age, level and weaknesses should guide the selection of the relevance method. For instance, it would be wrong of a teacher to impose the use of discussion method on any category of learners that have speech deficiency**.** Delicate equipment as well as hazardous chemicals will not be left for young learners to handle. Therefore, laboratory method involving such will be wrong method to be used at this level. The demonstration method will be a better choice.

Suitability of the Method: Certain techniques will be used to achieve the stated instructional objectives than others. The lecture method for instance will teach factual information–laws, concepts, principles, while the laboratory method will teach practical skills better respectively. Similarly, the inquiry or discovery method and project method will teach problem solving skills better than discussion or lecture methods. This involves choosing the best method for a particular subject matter, that is, the topic to be taught. . No matter how good a strategy of teaching is, if the method is not in line with the topic, little or no success will be achieved.

Competence of teacher to use a particular method: The Basic Sciences teacher should select a method that he or she can effectively handle. This implies that if the teacher feels more competent in the lecture method, regardless of its limitations that method should be employed instead of using another method which the teacher is not proficient and therefore cannot use effectively.

Size of the class: The size of a class is an important factor to consider in selecting a method to teach integrated science lesson. Large classes are better taught using

lecture and discussion methods. However, laboratory methods will make use of small groups or individual learners.

Resources available for instruction: By resources we mean the instructional aids or materials. The resources available to a teacher often constrain him/her to the method(s) to select. If a school does not have a laboratory for instance, it is impossible for the teacher to employ the laboratory method. However, he can use the demonstration method in the class to show some of the practical skills or use the field trip or excursion methods where students will visit industries to see things done practically. If the school has computers, he can simulate some practicals that are difficult to perform in the laboratory.

Time of the lesson: Time allocated for the subject on the timetable should be a guide in the selection of teaching methods. The learners are more active in the morning hours than later in the day when boredom and tiredness may set in. Therefore a selected teaching method must be such that make the learners active participants. A lecture method adopted in the morning will therefore be more effective than in afternoon during the heat of the sun. It must be noted that no single teaching method is recommended by experts for teaching basic science. The choice is left in the hand of the teacher and the method could change or vary as many times as the need arises depending on the concept, skill or attitude that is to be developed in the learners.

Research into Quality Teaching and Learning of Science

Quality teaching of science is crucial for developing scientifically literate citizens and improving the economic productivity for sustainable development (United Nations Educational Scientific and Cultural Organization, UNESCO 2000). Darling-Hammond (1999) notes, quality teaching is crucial in enhancing students' achievement and strengthening public confidence in schools. Other reports and researchers (American Association for the Advancement of Science, AAAS 1989; National Commission on Mathematics and Science Teaching, NCMST 2000; National Research Council, 1997) emphasize that quality teaching helps students attain a deep conceptual understanding. Adegbamigbe (2002) defines quality teaching as a series of dynamic processes and activities of teachers' actions within the educational context with a view to enhancing quality of students' learning and promoting job satisfaction.

Polland and Tann (1993) argue that quality teaching involves teachers who are competent with adequate knowledge and skills needed for effective classroom management, students' assessment, subject teaching, and those who engage in regular professional learning. Also Vant-Hooft (2005) claims that quality teaching encompasses prior knowledge activation, hands-on learning, and continuous reflection.

The report of the National Commission on Mathematics and Science Teaching for the 21st century, NCMST (2000) presents a vision of high quality teaching which are summarized as those wherein: teachers have an adequate knowledge of subject matter; encourage inquiry and hands-on approaches to learning for students; recognize individual students as learners and insist that

students learn; have adequate skills of observation, information gathering, sorting, classifying, predicting, and testing; having the knowledge and skills of questioning and probing, and also reflect on their practices; build on learners' strengths rather than trying to stamp out their weaknesses; carefully and thoroughly align the curriculum with assessment practices, and high standards for student learning in connection to the achievement of the students.

Quality teaching basically, is a "process that helps teachers to focus on the educational improvement of learners through the integration of adequate knowledge of the curriculum content areas, functional pedagogic skills, critical reflective teaching, empathy and commitment to the educational process, and the acquisition of managerial competencies within and outside the school context" (OECD (Organization for Economic Co-operation and Development), 1994, p. 35).

From the above definition, it is clear that quality teaching fundamentally involves teachers' knowledge of content and pedagogical skills, knowledge of the curriculum and effective supervision and classroom management as well as reflection to improve the learning outcomes of the learners.

The National Science Education Standards (National Research Council, 1996) clearly presents a vision for quality teaching and learning of science that includes:

1. Students learning of science is greatly determined by how they are taught by teachers;
2. Teachers' perceptions of science as a discipline and as a school subject to be learned by the students greatly influenced their actions and their attitudes toward teaching

3. Students' understanding of science is achieved through their engagement and active construction and social processing of information; and
4. Teachers' understanding of and relationship with their students have a great influence on their actions.

Quality teachers of science therefore are knowledgeable about science, learning, and science teaching and they create an environment where students are regarded and treated as active learners (National Research Council, 1996).

Gess-Newsome (1999) however argues that quality teachers have content knowledge and attitudes, pedagogical knowledge and skills, knowledge of students, and knowledge of curriculum. Gess-Newsome (1999) describes *content knowledge and attitudes* as those comprising teachers' conceptual knowledge, knowledge of nature of science, knowledge of integration, and relevance, and teacher attitudes such as enthusiasm and a willingness to support and create time for effective science teaching. According to Gess-Newsome, teachers who show positive attitudes such as curiosity, using problem solving approaches when answering questions, relying on data, being sceptical of explanations while being open to new ideas, and respecting reason and honesty in science will encourage their students to modeling such similar attitudes.

Gess-Newsome refers to *pedagogical knowledge* and skill as the ability of the teacher to plan, implement and assess students' engagement in meaningful science teaching that is active, relevant, developmentally appropriate, and build on learners' prior knowledge through the use of activities that are inquiry-oriented, support the social construction of accurate science knowledge, and develop classroom community.

Furthermore, Gess-Newsome argues that *knowledge of students* encompasses both a general knowledge of student development and specific knowledge of the students in one's own classroom. This allows the teacher to capitalize on student interests and motivations to create a relevant science curriculum as well as knowledge of student misconceptions for commonly taught topics.

Finally, Gess-Newsome describes the *knowledge of curriculum* as that which allows a teacher to select, adapt, or create instructional materials to meet student needs and recognize how these materials combine to create a coordinated program of science across grade levels and across the curriculum.

Quality teaching in science, therefore, also involves science teachers' knowledge of the diagnostic skills for analysing the work students are doing, identifying their weaknesses and stage of progress, and then devising the means of helping students make progress, and for those who are experiencing difficulties, collaborating with other teachers through participative inquiry to devise learning plans for these students (Elmore, 1995; Goodrum& Hackling, 2003).

For the purpose of this study, quality teaching in science could be described as involving the ability of a teacher to use his or her knowledge of subject matter, knowledge of curriculum and the students, knowledge of teaching materials and classroom administration and pedagogy to facilitate students' learning outcomes in science.

An Inquiry Approach in Teaching and Learning of Science

The National Science Education Standards (National Research Council NRC, 1996) claims that an understanding of the nature of scientific inquiry is an important goal of science education. A similar report by the American Association for the Advancement of Science (AAA, 1989) points out that inquiry approaches in science enable teachers' to be creative and enrich students' abilities in understanding science concepts and processes.

Germann, Haskins and Ausl, (1996) claim that developing scientific literacy for the citizens requires engaging learners in scientific inquiry for them to develop broad knowledge and understandings of the processes and nature of science. The National Science Education Standards (NRC, 1996) notes that learners investigate, generate, ask authentic questions and construct reasonable explanations for the questions formulated through an inquiry approach in science teaching and learning so that they understand the world around them and become scientifically literate. Also inquiry instruction in science enables learners to formulate their own questions, devise ways to answer them through data collection and analysis and then determine the reliability of the knowledge acquired (Edwards, 1997).

Lawson (1995) further indicate that through inquiry-oriented teaching teachers could help learners to build their interest in the materials and activities, and to encourage their thinking, questioning and discussion for a variety of investigatory paths which fits the lesson content and learners' intellectual level with everyday social application problems.

Literature in science education describes three levels of inquiry-based teaching and learning. These include structured inquiry, guided inquiry and open inquiry (Colburn, 2000; Hackling & Fairbrother, 1996). Colburn describes **structured inquiry** as one that involves the teacher engaging students in problem-solving activities and provides them with the procedures and materials to discover and generalize on their own from data collected. Essentially, the approach prescribes what students are to observe and which data they are to collect. **Guided inquiry** on the other hand involves the teacher providing only the materials and problem to investigate while the students manipulate the materials and solve the problem on their own. **Open inquiry** is similar to guided inquiry with the addition that students also formulate their own problem to investigate. Open inquiry in many ways, is analogous to doing science and a typical example of student open inquiry being the science fair or science talent search projects (Hackling, 1998; Hackling &Fairbrother, 1996).

In Nigeria, the inquiry approach has been recognized as a crucial teaching strategy for improving students' learning of science (FME 1985; Federal Government of Nigeria, FGN 1998). The National Policy on Education (FGN, 1998) affirmed that teaching of science in schools should be by guided-discovery and inquiry approaches. However, studies indicate that inquiry teaching and learning approaches are rarely practiced in Nigerian science classrooms because of the lack of resources for effective practical work, among other factors (Ajewole, 1994).

Ogunbowale (2001) points out that the broad scope of the science curriculum and emphasis on quantity of content coverage are the major constraints on inquiry approaches in science teaching and learning in Nigerian

schools. However, the literature suggests that when teachers teach less content, they teach it better by introducing ideas in a variety of ways and thus encourage students' learning (Rutherford & Ahlgren, 1990; Wenning, 1997). For the purpose of this study therefore, scientific inquiry could be referred to as an approach in which teachers create an enabling environment for students' curiosity and engage them in scientific investigations to solve problems that satisfy their ideas about the natural world.

Teaching methods such as inquiry teaching, problem solving, problem based learning and project based learning relies heavily on the effective use of the science process skills by students to complete an investigation (Colley, 2006). Inquiry science teaching is teaching science by having students engage in more science activities and exercises and encourages children to learn science and learn about science (Olson &Louks-Horsley, 2000). Also, students engaged in simple inquiry engage in processes such as observing, comparing, contrasting and hypothesizing (Cuevas et al., 2005). One area of contemporary research on inquiry is related to children's understanding and use of science process skills in designing investigations (Keys & Bryan, 2001). Scientific

Inquiry exercises typically serve as the primary source of science process skill development and inquiry is used to teach science process skills (Wilke& Straits, 2005). According to Minner et al. (2010), the term inquiry has figured prominently in science education, three distinct categories of activities: what scientists do, how students learn, and a pedagogical approach that teachers employ.

Summary

Effective teaching occurs when students learn and achieve many scientific goals and not just being able to repeat scientific knowledge (Omoifo 2012). Ayodele (2006) identified the use of inappropriate non-effective teaching methodology as a major factor hindering students understanding and achievement in science. The teaching and learning of science do not require theoretical and lecture approaches. Onose (2009), posited that many in-experience teachers teach science in abstraction, thereby making science lessons boring and the students finding it difficult to grasp some scientific concepts, skills and principles.

Abdulahi (2007), observed that most teachers emphasis theory rather than practical aspects of science subjects and most of them lack adequate knowledge of subject matter and the competence to deliver. In addition, they stressed that the teaching of science has been reduced to a descriptive exercises through the use of lecture method and very little inquiry. Although, the National Policy on Education (1998), emphasized the activity based and child centered learning, most science lessons are of the traditional lecture. There are few classrooms with demonstrations, and when in use it is often teacher demonstration which makes students passive. Our science lessons are yet to be structured, guided and students directed. (Omoifo, 2012).

Improving the quality of science teaching and learning in schools has been recognized as the bedrock for all the citizens to become scientifically literate to meet the current challenges of modern science and technology (AAAS, 1993; National Research Council, 1996). Outcomes of research in science teaching and learning over the years recognize that constructivist teaching approaches could

help in improving science teaching and learning, and that science teaching should be inquiry and activity-based for effective learning (Bell et al., 2003)

Effective teachers of science possess pedagogical content knowledge that provides them with an understanding of how particular subject-matter topics, problems, and issues can be organized for effective teaching and learning to meet the needs of students with diverse interests and abilities (Darling-Hammond, 1997).

In conclusion, this Chapter reviews the historical background of Basic science education in Nigeria and considers the new Basic Science and Technology curriculum documents, factors to consider before selecting a teaching strategy, science education research literature in regards to quality teaching and learning of science in schools, including an inquiry approach into teaching and learning of science

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter gives an indication of what was done to determine the influence teaching method has on the academic achievement of student in Basic Science. The procedure employed in conducting this research work, to achieve the goals of the study was discussed under the following headings:

- Research Design
- Population of the study
- Sample/Sampling technique
- Instrument for data collecting
- Validation of instrument
- Administration of instrument/Data collection
- Method of data analysis

Research Design

The research design that was used by the researcher in this study was the survey research design. The survey research design was considered most appropriate because it has a formal approach in collection of data from various sized group chiefly through the questionnaire as representative of the whole population. The aim is to have the assessment of the opinions of students and teacher about how teachers teaching method influences students' academic achievement specifically in Basic Science.

Population of the Study

The population of the study compromises of a total of two hundred (200) JSSI to JSS III students offering Basic Science as a subject and a total of (20) Basic Science teachers from eight (8) schools in Egor Local Government Area of Edo State.

Sample/Sampling Technique

Three (3) secondary schools in Egor Local Government Area of Edo State were selected for the study. The selection of these secondary schools was done by simple random sampling. The study used a sample of ninety (90) students randomly selected from these three (3) secondary schools. The ninety students include thirty (30) students from each secondary school. All Basic Science teachers in these three schools are involved in this study regardless of the number in each school.

Instrument of Data Collection

The research instrument for the study was the questionnaire which was developed by the researcher basically for the study. The questionnaire was a breakdown of question seeking to achieve the basic information on the influence teaching method has on the academic achievement of students offering Basic Science in Junior Secondary Schools in Egor Local Government Area of Edo State.

The questionnaire was formulated based on the research question raised. The instrument has two (2) sections, section A and section B. Section A is meant for collecting data on the profile of students and teachers, while Section B is made

up of thirteen (13) test items with options for both teacher and student questionnaire.

Validity of instrument

In other to check and determine the content validity, the research instrument was submitted to the project supervisor for proper scrutinizing, criticism and screening so as to validate the questionnaire. All the contributions, suggestions and corrections that were made by the project supervisor were effected by the researcher.

Administration of Instrument

The researcher went to each of the selected schools to administer the questionnaire. The students were given enough time to read and answer the questions honestly which was then returned to the researcher on completion.

The researcher personally administered the questionnaire to the various Basic Science teachers in each School. The researcher waited patiently to collect the questionnaires after the teachers had responded.

Method of Data Analysis

For this study, data analysis was carried out based on the responses from the teachers and students in the various schools. The data collected and the information gathered were arranged, thoroughly examined and analyzed using simple percentage. This is used because of the easy and clear way of presenting analytical results that would reflect the true position of the opinion of students and teachers.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION OF RESULT

This chapter deals with the analysis of data through the application of the appropriate statistical procedures mentioned in chapter three. The aim is to answer the research questions raised in chapter one.

Research Question One

Does lack of laboratory facility and equipment affect the selection of adequate teaching method?

TABLE 1A: Students Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No
1.	Is there a laboratory facility in your school?	37	41.11	53	58.89
2.	Does the laboratory have equipment for Basic Science practicals?	35	38.9	55	61.1
3.	Have you ever been thought Basic Science with teaching aids?	44	48.9	46	51.1
4.	Does your teacher regularly take you to the laboratory for basic practicals in Basic Science?	8	8.89	82	91.11

From table 1A in response to the questions, 41.11% of the student agrees to the fact that there is indeed a laboratory facility in their school, in opposition 58.89% vividly admit that there is no laboratory facility in their school. Also 38.9% ascertain that adequate laboratory equipment are available for practical while 61.1% indicate that the laboratory is ill equip with materials for basic science practical.

However, 48.9% agreed that their teacher uses teaching aids when necessary during instruction, while 51.1 concluded that their teacher don't use teaching aids when teaching. It can also be seen that 8.89% agree that their teachers regularly take them to the laboratory for practical, while 91.11% are of the opinion that teachers don't regularly take them to the laboratory for practical.

TABLE 1B: Teachers Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No
1.	Is there a laboratory facility in your school?	2	25	6	75
2.	Does the laboratory have equipment for Basic Science practicals?	2	25	6	75
3.	Do you think regularly organizing practical classes for your students will help them attain higher academic achievement?	8	100		
4.	Do you think including teaching aids during teaching will increase students' academic achievements?	8	100		

From table 1B in response to the questions, 25% of the teachers supported the fact that there is a laboratory facility in their school, but others constituting 75% vividly admit that there is no laboratory facility in their school. Also 25% ascertain that adequate laboratory equipment are available for practical while 75% indicate that the laboratory is not equip with materials for basic science practical.

However, the entire teachers sample indicated that regularly organizing practical classes for their students and including teaching aids during teaching will increase students' academic achievements.

Research Question Two

Does the class size affect the use of teaching methods?

TABLE 2A — Students Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% Of No
5.	When in class do you understand better when the students are few?	78	86.67	12	13.33
6.	Do you understand better in class when the students in class are very many?	23	25.56	67	74.44

From the data presented in table 2A, responses indicated that 86.67% of the students are of the view that having few numbers of students in class helps them to understand better during classroom lesson, but 13.13% are of the opinion that they tend to understand less when the students in class are few. Also for situations where the students in class are very many, 25.56% seems to agree that they understand better when the student in class are many while 74.44% disagree.

2B: Teachers Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No

5.	The amount of students in a class and the size of the class determine my method of teaching during instruction?	7	87.5	1	12.5

From table 2B above, 87.5% of the teachers agreed that the amount of students in a class and the size of the class determine their method of teaching during instruction, but 12.5% disagree to this fact.

Research Question Three

Does the teacher's year of experience affect the proper usage and implementation of different teaching method?

TABLE 3A: Students Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No
7.	I will learn better if the teaching of Basic Science is presented in a very interesting way?	85	94.44	5	5.56
8.	Does your Basic Science teacher changes his or her method of teaching during classroom lesson?	48	53.33	42	46.67

From the data presented in table 3A, it can clearly be seen that 94.44% of the student agreed that they learn better when the teaching of Basic Science is presented in a very interesting way; in contrast 5.56% of the student do not attribute increase in learning with an interesting way of teaching basic science. In the aspect of using more one method of teaching 53.33% of student agreed that their teacher changes his or her method of teaching during classroom lesson, however 46.67% indicated that they disagree.

TABLE 3B Teachers Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No
6.	The teachers' years of experience influence his use of appropriate teaching method in influencing the achievement of students in Basic Science?	7	87.5	1	12.5
7.	Teachers' verbal persuasion and motivational force with respect to the task of classroom instruction helps to increase students' determination in performance?	7	87.5	1	12.5
8.	Is it true that higher level of education would endow teachers with higher level of knowledge and skills relevant to the work of teaching?	8	100	–	–

Summarizing carefully the above table 3B one can see that 87.5% of teachers favour the fact that teachers' years of experience influence his use of appropriate teaching method in influencing the achievement of students in Basic Science, while 12.5% of the teachers admitted that teachers' years of experience don't influence his use of appropriate teaching method. More so, 87.5% of teachers agreed that teachers' verbal persuasion and motivational force with respect to the task of classroom instruction helps to increase students' determination in performance, in opposition 12.5% disagree to this fact. On high level of education, the entire teachers representing 100% of the respondents agreed to the fact that higher level of education would endow teachers with higher level of knowledge and skills relevant to the work of teaching.

Research Question Four

Does the teaching method used have a direct impact on students' academic achievement?

TABLE 4A: Students Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No
9.	Do you enjoy the teaching method your teacher uses in class?	85	94.44	5	5.56
10.	Do you think going on excursion will improve your learning of Basic Science?	81	90	9	10
11.	Does your engagement in practicals increase your understanding and help you perform better in Basic Science.	87	96.67	3	3.33
12.	Does the teacher create room for asking question in class during teaching?	77	85.56	13	14.44
13.	Do you think solving assignments will improve your knowledge in Basic Science	84	93.33	6	6.67

From the above table 4A it is obvious that 94.44% of the student enjoy the teaching method their teacher uses in class, while only 5.56% are not enthusiastic about the methods of instruction used by their teacher. Unanimously, 90% of the student agreed that going on excursion will improve their learning of Basic Science, while 10% does not see excursion as a need in improving the learning of Basic Science

Also it can be observed that while 96.67% of the students supports that engagement in practicals increase their understanding and help them perform better in Basic Science, the opinion of 3.33% of the students suggest that practicals do not help in performance. 85.56% of student concluded that teachers do ask them questions in class, however 14.44% are of the opinion that teachers don't ask them question in class during instruction.

Lastly on table 4A, 93.33% think that solving assignments will improve their knowledge in Basic Science. But others constituting 6.67% disagree on the positive effects solving assignment will have on them.

TABLE 4B: Teachers Questionnaire

S/N	Questionnaires	Yes	% of Yes	No	% of No
9.	One or more method of instruction can be employed due to circumstances to elicit a particular behavior i.e. by trying a different method I can significantly affect students' academic achievement?	8	100		
10.	Do you think finding the best teaching method that is right for the type of learners a teacher has (e.g. slow gifted or average learners), helps to increase the students' academic achievements?	8	100		
11.	Is it true that effectiveness in science teaching has little influence on the achievement of students studying Basic Science?	4	50	4	50
12.	When the grades of students improve, it is usually because their teachers found more effective teaching approaches	5	62.5	3	37.5
13.	Do YOU vary your method of teaching?	8	100		

From the above table 4B the entire respondents supported that teachers can significantly affect students' academic achievement by employing different method of instruction in addition to finding the best teaching method that is right for the type of learners a teacher has due to different circumstances. When considering the effectiveness science teaching has on the achievement of students studying Basic Science, 50% of the respondent agreed that indeed

effective science teaching has positive influence on students' academic achievement while 50% disagree.

Also 62.5% of the teachers agreed that student's grade improve due to more effective teaching approaches, while 37.5% do not support this fact. It is clear from the above that all teachers are in agreement with the fact that they vary their method of teaching.

Discussion of Results

According to the analysis and presentation of data on the study it has been revealed that schools lack appropriate laboratory facility and equipment and this invariable affect teacher's selection of adequate teaching method for instruction thereby having less impact on students' academic achievement. In many schools there are no laboratories. Some schools merely have empty rooms labeled laboratories. Students rarely have hands-on, minds-on experiences. This is in consonance with (Omoifo, 2012) who proposed that, lack of laboratory facilities cannot make for effective learning and eventually results in poor achievement. Improvement is also needed in the use of effective teaching aids. This is expressed in in the thought of (Ogunmade, 2006), who stated that majority of schools lack the essential resources for imparting the knowledge of basic science concepts to students, many students learn little science, learning tends to be by rote and many students find basic science not interesting and boring. Also in line with the results Audu and Oghogho, (2006) stated that In most of our schools, there are no facilities for the teachers to demonstrate phenomena, let alone allow the students to have opportunities for finding out things for themselves

The analysis also shows that students learn more, are more relaxed and comfortable in a class with few students. As a corollary to this, Smith and Glass (1980) indicates through meta-analyses that compare to large classes, small classes lead to higher pupil achievement, more favorable teacher effects (e.g. moral, attitude towards student) greater attempts in individual instruction, a better classroom climate and more favorable student effects (e.g. self-concept and participation). In most third world countries, enrolment exceeds provision for secondary education in terms of adequate furnished classrooms. In Nigeria, Secondary education in the country is poorly funded, hence most of the secondary schools experience classroom congestion, low students-classroom-space and low classroom utilization rates. These situations ultimately affect teachers' use of teaching method and this adversely affect students' academic performance. The National policy on Education prescribed a maximum of 30 students in a class, but in most secondary schools in the state average class size exceeds 50–100 students. Yet, these students need to learn in comfort. This finding is clearly seen in a study by Idienumah (1987), who reported that there is positive relationship between certain variables such as class size, teacher – pupil ratio, students' factors and performance in examination. They were discovered to be factors that have strong and direct influence on academic performance of schools. Schools with larger class size and high teacher-pupil ratio recorded poor performance while better academic performance is associated with schools with small size and lower teacher-pupil ratio.

From the analysis and interpretation of data it is clear that the teacher's years of experience in addition to his verbal persuasion and motivational force with respect to the task of classroom instruction helps to increase students'

determination in performance. From the study, he will be able to make teaching/learning interesting and of course be more readily able to very his method of teaching. That is why as stated by (Dahar and Faize, 2011) Proper training of teacher may strengthen the causal-relationship between the various qualities of teachers and academic achievement.

Lastly, the findings reveal that teachers teaching method have a direct impact on students' academic achievement. This is in line with Okafor (2007), who emphasized that teaching lies at the teacher's capacity to transform written knowledge into forms that are pedagogically powerful and yet adaptive to the students' abilities and backgrounds. Whatever method a teacher decides to use, students learn more as long as it meets the needs of the students. By sounding a warning regarding this fact Ayodele (2006) identified the use of inappropriate non-effective teaching methodology as a major factor hindering students understanding and achievement in science.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This research was designed to investigate the influence teaching methods have on the academic achievement of student studying Basic Science in Egor L.G.A. of Edo State.

In the introduction to the study, a brief overview was given on the benefits of general science to the student and society at large, the importance of teaching method and how it affects students' achievement when poorly applied. The purpose of the study was stated, this includes factors such as laboratory facilities and class size, and how they affect the selection of teaching strategies. To fulfill the purpose of the research, four research questions were raised in the course of the research work, they include:

1. Does lack of laboratory facility and equipment affect the selection of adequate teaching method?
2. Does the class size affect the use of teaching methods?
3. Does the teacher's year of experience affect the proper usage and implementation of different teaching method?
4. Does the teaching method used have a direct impact on students' academic achievement

Questionnaires were used to solicit information from respondents. A total of 90 students from three (3) randomly selected secondary schools were used. The total number of eight (8) teachers was used for this research. Data gathered were analyzed using simple percentage.

Findings

It was found that;

- Most of the secondary schools surveyed don't have good laboratory facilities. To worsen the problem of lack of or inadequate equipment, the few available ones are not properly maintained, protected and cared for.
- All Basic Science teachers in the surveyed schools varied their method of teaching Basic Science in response to circumstances.
- Students preferred few class members as this situation helps them learn better during classroom lessons.
- The teacher's years of experience in addition to his verbal persuasion and motivational force with respect to the task of classroom instruction helps to increase students' determination in performance.
- Inappropriate application of teaching method negatively affects students' academic performance.

Conclusion

In view of the findings of the study, the following conclusions were made:

1. Most schools don't have a well equip laboratory facility for basic practicals in Basic Science.
2. Improvement need to be made on the use of teaching aids in teaching Basic Science as this will ultimately help student retain relevant information for a longer period of time.
3. The teachers' years of experience influence his use of appropriate teaching method in influencing the achievement of students in Basic Science
4. The amount of students in a class and the size of the class determine to an extent the teacher's method of teaching during instruction.
5. They tend to be increase in academic achievement when the student in a class are few
6. The method of instruction used by the teachers have a direct impact on students' academic achievement

Recommendations

- Governments should be implored to give enough grants to equip laboratories with chemicals and apparatus, and also to provide useful materials and appropriate teaching
- Large class sizes make it difficult for teachers to get to know individual students as learners. Therefore more adequate classroom should be created with few students, not more than 30–40 students as stated in the National Policy of Education. This will undoubtedly help teachers create an enriched learning environment, engage in continuous professional learning, and encourage their students in lifelong learning.
- Teachers should be encouraged to attend workshops and seminars to improve on their existing quality and effectiveness.

Suggestion for further research

Teachers should first follow a program that would make students acquire the science process skills. Then they should integrate that program with the science curriculum since science process skills have a hierarchic structure. A student who does not have the basic skills could not improve the skills about performing experiments easily. Whereas, what we firstly do at schools is making students do experiments. That is starting from the end and a big mistake. For this reason, teaching science process skills should never be neglected giving such excuses as shortage of time and overloaded syllabuses.

Opportunities should be to enrich teachers' practices and competencies through in-service training, conferences, seminars and workshops should be provided on a regular basis to help them keep abreast with recent developments in the field of science and broaden their knowledge of subject matter.

Guided discovery/inquiry method should be used by Basic Science teachers.

REFERENCES

- Abdulali A. (2007) Functional Science, Technology and Mathematics Education for National Economic Empowerment and Development. A Speech Delivered at the 2007 School of Science National Conference held at Federal College of Education, Zaria, April 2-5
- Adedoyin FA (1990). *Teaching strategies in population education*. In: Perspective in Population Education, Selected Readings in Population Education 2, National Education and Development Council (NERDC). Lagos, NERDC Press.
- Adegbamigbe, A., B. (2002). *Teachers' perceptions of quality teaching in junior secondary school physical education in Lagos State, Nigeria*. Unpublished PhD, Edith Cowan University, Western Australia.
- Adunola, O. (2011),"*The impact of Teachers' teaching method on the Academic Performance of primary pupils i*n Ijebu-ode Local Government Area of Ogun State". Ego Booster Books, Ogun State Nigeria.
- Ajagun, G.A (1990). —Pre-service Integrated Science Teacher Education at ABU. A Suggested Model Association Report‖. Kings College London.
- Ajewole GA (1991). Effects of discovery and expository instructional methods on the attitude of students to Biology*. J. Res Sci Teaching. 28: 401-409*.
- Ajewole, G. A. (1994). Effects of guided-discovery and expository instructional methods on the attitude of students to biology. *Journal of Research in Science Teaching, 28*(5), 401-409.
- Akinlaye, G.A. (2010), *Enhancing the quality of life in this complicated but dynamic world". 25th Inaugural Lecture*, University of Ado-ekiti, April 6th.

- Ayeni, A.J. (2011), "Teachers professional development and quality assurance in Nigerian Secondary Schools," *World Journal of Education*, 1(2):143-149.
- Ayodele O. O (2006) Building A Sustainable Science Curriculum in Nigeria; Accommodating Local Adaptation, Leveraging Technology and Enhancing Ares of Improvement for Quality Assurance. Journal of Science Teachers Association of Nigeria 1(7)
- Bell, R. L., Blair, L. M., Crawford, B. A., & Lederman, N. G. (2003). Just do it? Impact of a science apprenticeship program on high school students' understandings of the nature of science and scientific inquiry. Journal of Research in Science Teaching, 40(5), 487-509.
- Callahan JE, Clark LH (1977). Innovations and Issues in Education, New York, Macmillan Publishing Co. Inc.
- Colley, K.E. (2006) Understanding ecology content knowledge and acquiring science process skills through project-based science instruction. *Sci. Activity., 43,* 26-33.
- Collins, A. &Robert J. (2004),"*Enhancing Student Learning Through Innovative Teaching and Technology Strategies*,"Kogan Page.
- Cuevas, P., Lee, O., Hart, J. &Deaktor, R. (2005). Improving science inquiry with elementary students of diverse backgrounds. *J. Research in Science Teaching*, *42*, 337-357.
- Darling-Hammond, L. (1994). *Professional development schools: Schools for developing a profession.* New York: Teacher College Press.
- Duada, D.M and Udofia N (2010). —Comparing the Objectives, Themes and Sub-Themes of the Integrated and Basic Science Curriculum of the Junior Secondary Schools (JSS). *JSTAN 45 (1&2) 36-46.*

- Edwards, C. H. (1997). Promoting student inquiry. *The Science Teacher, 64*(7), 18-21.
- Elmore, R. (1995). Structural reform and educational practice. *Educational Researcher, 24*(9), 23-26.
- Federal Ministry of Education. (FME, 1985). National core curriculum for junior secondary schools. Lagos: Federal Government Press.
- Federal Government of Nigeria. (1998). *National policy on education (3rd edn)*. Lagos: NERDC.
- Gess-Newsome, J. (1999). Delivery models for elementary science instruction: A call for research. *Electronic Journal of Science Education, 3 (3)*.
- Germann, P. J., Haskins, S., &Ausl, S. (1996). Analysis of nine high school biology laboratory manuals: Promoting scientific inquiry. *Journal of Research in Science Teaching, 33*(5), 475-499.
- Goodrum, D., & Hackling, M. (2003). *Collaborative Australian Secondary Science Program pilot study*. Edith Cowan University.
- Hackling, M.W. (1998). *Working scientifically: Implementing and assessing open investigation work in science*. Perth: Education Department of Western Australia.
- Hackling, M.W., &Fairbrother, R. W. (1996). Helping students to do open investigations in science. *Australian Science Teachers Journal, 42*(4), 26-33.
- Hudson-Ross, S. &McWhoter, P. (1996), *Going back/looking in: A teacher educator and high school teacher explore beginning teaching together*," English Journal, 84(2): 46-54.
- Keys, C.W. & Bryan, L.A. (2001). Co-constructing inquiry-based science with teachers: essential research for lasting reform. *J. Research in Science Teaching, 38,* 631-645.

- Lawson, A. E. (1995). *Science teaching and the development of thinking*. Belmont, CA: Wadsworth Publishing Company.
- McDonald B, Nelson W (1954). Methods that teaches. W. C. b., pp 251. National Policy on Education, Nigeria, Revised Edition, 1998. pp 25
- Minner, D.D., Levy, A.J. & Century, J. (2010). Inquiry-based science instruction - what is it and does it matter? Results from a research synthesis years 1984 to 2002. *J. Research in Science Teaching*, *47*, 474–496.
- National Commission on Mathematics and Science Teaching. (NCMST, 2000). *Before it's too late.* Jessup, MD: Education Publications Centre, U.S Department of Education.
- National Research Council. (1997). *Improving schooling for language-minority children: A research agenda*. Washington, DC: National Academy Press.
- OECD. (1994). *Quality in teaching*. Paris: OECD.
- Offorma,G.C (2005). ―*Curricula for Wealth Creation*‖. A paper presented at the Seminar of the World Council for Curriculum and Instruction. Kano,Oct. 25th
- Ogunbowale, N. B. (2001). Inhibiting factors in the effective teaching of biology in secondary schools- Implication for the teachers. *Journal of Sandwich Education Review, 2*(1&2), 18-24.
- Olson, S. &Louks-Horsley, S. (Eds.) (2000). *Inquiry and the national science education standards: a guide for teaching and learning.* Washington: National Academies Press.
- Omoifo, CN. (2012). Dance of the Limits, Reversing the Trends in Science Education in Nigeria, Inaugural Lecture University of Benin, Benin City

- Onose, G. M. Okogun E. A and Richard J. (2009) Reforms and Innovation in Training and Retraining of cience and Mathematics Teachers to meet with the Challenges of Global Development. Journal to Teacher Perspective . 3 (2).
- Polland, A., &Tann, S. (1993). *Reflective teaching in the learning school: A handbook for the classroom.* London: Open University.
- Rogus JF (1985*). Promoting self-discipline*: A comprehensive approach. Theory into Practice. 24(4): 70
- Rutherford, F. J., &Ahlgren, A. (1990). *Science for all Americans*. New York: Oxford University Press pp. xviii-xix.
- Tebabal, A and Kahssay, G. (2011), "The effects of student centered approach in improving students' graphical interpretation, skills and conceptual understanding in kinematical motion". *Lat. Am. J. Phy. Edu*, 5(2):374-381
- United Nations Educational Scientific and Cultural Organization, UNESCO (2000). *Education in situations of emergency and crisis: Challenges for the new century.* Geneva: UNESCO.
- Van'tHooft, M. (2005). The effect of the "Ohio school going solar" project on student perceptions of the quality of learning in middle school science. *Journal of Research in Technology Education, 37(3)*, 221-244.
- Webb NM (1982). *Peer interaction and learning in cooperative small groups*. Review of Educational Research (FALL). 52(3): 70-72.
- Wenning, C. J. (1997). *A multiple case study of novice and expert problem solving in Kinematics*. Godfrey, IL: Illnois section of the American Association of Physics Teachers.

- Wilke, R.R. & Straits, W.J. (2005). Practical advice for teaching inquiry-based science process skills in biological sciences. *American Biology Teacher*, *67*, 534-540.
- American Association for the Advancement of Science. (AAAS, 1989). *Science for all Americans.* Washington: AAAS.

UNIVERSITY OF BENIN, BENIN CITY

FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND CURRICULUM STUDIES

QUESTIONAIRE FOR TEACHERS

The researcher is from the University of Benin, carrying out a research on the influence teaching method has on the academic achievement of students offering Basic Science in junior secondary schools in Egor Local Government Area, Benin City. This questionnaire is, therefore, to help obtain information on the teaching methods used by teachers in order to positively bring out the best in the students. It was created purely for academic purposes.

It would be greatly appreciated if you could frankly respond to the questions provided. Your responses will be used strictly for research purposes and will therefore be treated with utmost confidentiality. You should please tick (√) or write where necessary in the option for any question that best matches your choice of response. Thanks for your understanding and co-operation.

SECTION A

1. Name of school:_____
2. Type of school:_____
3. Sex: Male [ ] Female [ ]
4. Highest Qualification:
   WASC [ ] OND [ ] NCE [ ] HND [ ] B.Ed.[ ] B.Sc. [ ]
   BA [ ] M.Sc [ ]. M.Ed.[ ] PhD [ ]
   Others , specify_____
5. Experience (in years): 0-2 [ ] 3-5 [ ] 6-10 [ ] 11-15 [ ]
6. Marital status: Single [ ] Married [ ]

SECTION B

1. Is there a laboratory facility in your school?
   Yes [ ] No [ ]
2. Does the laboratory have equipment for Basic Science practicals?
   Yes [ ] No [ ]

3. Do you think regularly organizing practical classes for your students will help them attain higher academic achievement?
   Yes [ ] No [ ]
4. Do you think including teaching aids during teaching will increase students' academic achievements?
   Yes [ ] No[ ]
5. The amount of student s in a class and the size of the class determine my method of teaching during instruction?
   Yes [ ] No [ ]
6. The teachers' years of experience influence his use of appropriate teaching method in influencing the achievement of students in Basic Science?
   Yes [ ] No [ ]
7. Teachers' verbal persuasion and motivational force with respect to the task of classroom instruction helps to increase students' determination in performance?
   Yes [ ] No [ ]
8. Is it true that higher level of education would endow teachers with higher level of knowledge and skills relevant to the work of teaching?
   Yes [ ] No [ ]
9. One or more method of instruction can be employed due to circumstances to elicit a particular behavior i.e. by trying a different method I can significantly affect students' academic achievement?
   Yes [ ] No [ ]
10. Do you think finding the best teaching method that is right for the type of learners a teacher has (e.g. slow gifted or average learners), helps to increase the students' academic achievements?
    Yes [ ] No [ ]
11. Is it true that effectiveness in science teaching has little influence on the achievement of students studying Basic Science?
    Yes [ ] No [ ]
12. When the grades of students improve, it is usually because their teachers found more effective teaching approaches
    Yes [ ] No [ ]

13. Do YOU vary your method of teaching?

Yes [ ] No [ ]

UNIVERSITY OF BENIN, BENIN CITY

FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND CURRICULUM STUDIES

QUESTIONAIRE FOR STUDENTS

The researcher is from the University of Benin, carrying out a research on the influence teaching method has on the academic achievement of students offering Basic Science in junior secondary school in Egor Local Government Area, Benin City. This questionnaire is designed to elicit accurate response from students to find out if the teaching method used by their teacher influence their understanding in Basic Science. The honest response to the following questions asked will enable the researcher get some vital information to successfully conduct this research. You need not write your name.

All answers would be treated confidentially. Whatever information you supply will be strictly utilized for academic purposes. Please tick (√) or write where necessary in the space provided for the alternative that best express your answer. Thanks.

SECTION A

1. NameofSchool:_____
   _____
2. Age: _____
3. Sex: male [ ] female [ ]
4. Class: JSS1 [ ] JSSII [ ] JSSIII [ ]

SECTION B

1. Is there a laboratory facility in your school?
   Yes [ ] No [ ]
2. Does the laboratory have equipment for Basic Science practicals?
   Yes [ ] No [ ]
3. Have you ever been thought Basic Science with teaching aids?
   Yes [ ] No [ ]
4. Does your teacher regularly take you to the laboratory for basic practicals in Basic Science?
   Yes [ ] No [ ]
5. When in class do you understand better when the students are few?
   Yes [ ] No [ ]
6. Do you understand better in class when the students in class are very many?

Yes [ ] No [ ]

7. I will learn better if the teaching of Basic Science is presented in a very interesting way?
   Yes [ ] No [ ]
8. Does your Basic Science teacher changes his or her method of teaching during classroom lesson?
   Yes [ ] No [ ]
9. Do you enjoy the teaching method your teacher uses in class?
   Yes [ ] No [ ]
10. Do you think going on excursion will improve your learning of Basic Science?
    Yes [ ] No [ ]
11. Does your engagement in practicals increase your understanding and help you perform better in Basic Science.
    Yes [ ] No [ ]
12. Does the teacher create room for asking question in class during teaching?
    Yes [ ] No [ ]
13. Do you think solving assignments will improve your knowledge in Basic Science?
    Yes [ ] No [ ]