IMPACT OF TEACHERS' TRAINING ON THE IMPLEMENTATION OF INTEGRATED SCIENCE CURRICULUM IN JUNIOR SECONDARY SCHOOL IN OVIA NORTH EAST LGA

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CERTIFICATION

We, the undersigned certify that this research work was carried out by Victor AREBAMHEN in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City in the partial fulfillment of the requirement of the award of the Bachelor of Science (Ed) degree in Integrated Science and Education

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DEDICATION

This work is dedicated to the Almighty God, the Author of knowledge and wisdom, for his unfailing love, abundant grace, and mercies throughout my academic journey at the University of Benin, Benin City

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TABLE OF CONTENT

PAGE

ABSTRACT

This study evaluated the impact of teachers' training on the implementation of Integrated Science curriculum in junior secondary school in Ovia North East L.G.A of Edo State. Four research questions were raised to guide this study.

The study adopted descriptive survey research design. The population of this study comprises of thirteen (13) public junior secondary schools with two hundred and fifty (250) teachers in Ovia North East Local Government Area of Edo State. The respondents were the one hundred and fifty (150) public junior secondary school teachers in Ovia North East Local Government Area in Edo State. The sample size of five (5) schools was selected using the simple random sampling technique and thirty (30) teachers were selected from each sampled school making one hundred and fifty (150) teachers as respondents using convenience sampling technique. The instrument used for data collection is a self-constructed questionnaire. The measuring instrument for this study was subjected to her supervisor for validation. The comments, suggestions and corrections from the supervisor were effected in the final draft of the instrument. The data gathered was analysed using percentages and frequency counts.

Findings of the study revealed that inadequate implementation of curriculum affect teaching and learning of Integrated Science in junior secondary school. Insufficient teachers' training contributes to poor academic performance and weak scientific literacy. Poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum. There are possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum such as organize periodic in-service training, seminars, and workshops to update teachers on current trends well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments and many more. Based on the findings stated above, the following recommendations were made; Colleges of Education and universities should update Integrated Science teacher-education curricula to reflect current trends in science education, inquiry-based learning, and ICT integration. Ministries of Education should organize periodic workshops, seminars, and refresher courses on new teaching methods, curriculum changes, assessment strategies, and practical science activities. Government and school administrators should supply adequate laboratory materials, equipment, and ICT tools. Professional development should focus not only on content but also on how to teach integrated concepts effectively. Finally, schools should create platforms where Integrated Science teachers can share challenges, lesson plans, teaching aids, and innovative ideas.

CHAPTER ONE

INTRODUCTION

Background to the Study

Teachers, especially in developing countries, have long demanded to be given professional status. Before now it was like a dumping ground, where anyone who cannot get a desired job takes teaching as the last resort or means of income (Nemine, 2018). Personal experience shows that even secondary school graduates at a time entered into the teaching field just to utilize time while waiting for admission into tertiary institutions. These classes of people have not had any form of teacher training education and do not have prior knowledge of learning theories and principles or acquisition of teaching skills and methods. This made the teaching field a place for all, which does not reflect or portray teaching as a profession. According to Okeke (2014), trend analysis of the educational development in Nigeria points to the fact that there had been dearth of teachers with requisite aptitude, sufficient education, and specialized skills for the effective performance of the crucial role of teaching in the classroom. However, in recent time teaching has gone beyond what ordinary person along the street can enter into, because it has to do with professionalism and specialization. The term science has to do with nature; it is derived from the Latin word scientia, which means knowledge.

Also, the Delta State Ministry of Education Chief Examiners Report (2018) revealed students abysmal performance in Integrated Science at the Junior Secondary Certificate Examination. Problems such as poor school infrastructure, lack of qualified

Integrated Science teachers, poorly equipped science workshops and laboratories just to mention a few affects the teaching of Integrated Science. Despite these problems, the subject is still being taught in schools. Over the years, Educational researchers have investigated factors affecting students learning of Integrated Science in schools. At the heart of the inquiry, is the teacher's factor. Studies have established relationship between teachers' factors and students' achievement in school (Olatoye, 2016 and Adekola, 2016). Effective teaching of Integrated Science is an activity, which will bring about the most productive and beneficial learning experience for students and promote their development as learners. Effective teaching of Integrated Science goes beyond just imparting knowledge but it is a purposeful activity carried out by somebody with a specialized knowledge in Integrated Science in a skillful way to enhance cognitive, affective and psychomotor development of a person or group of persons.

For the teaching of Integrated Science to be effective, the Integrated Science teacher must have an extensive knowledge of the subject, knowledge of the curriculum, knowledge and understanding of how children develop and how they learn. This includes knowledge of the context in which learning occurs (home, community, school factor) and knowledge of assessment techniques. An Integrated Science teacher should possess some teaching skills and be able to plan lessons, manage a classroom, engage students in active learning, present challenging situations to encourage problem solving, collect and monitor information on achievement, maintain good students record, provide motivation for students and support cooperative group work. The teaching of Integrated Science

requires various teaching approaches and meaningful learning (Ayodele and Adegbite, 2013). The use of inappropriate methods could make students dread science education in later life.

In another development, Ololube, Egbezor and Kpolovie (2018) argued that the falling educational standards can be attributed to the use of teachers who are unqualified for instructional purposes, including those with general education (academic) qualifications such as Bachelors of Science (B.Sc.), Bachelors of Arts (B.A), Master of Science (M.Sc.) and Masters of Arts (M.A) degrees without teaching qualifications. It must be noted that without a professional teaching qualification, no meaningful progress can be achieved in the teaching profession. A teaching qualification or teacher qualification is one of a number of academic and professional degrees that enable a person to become a registered teacher in primary, secondary or tertiary institutions. These teaching qualifications may include TC II, NCE, B.Ed/BA/B.Sc, PGDE, M.Ed and PhD. It has been observed that most integrated science teachers in our secondary schools are teaching outside their areas of specialization. For instance, a Physics teacher will be assigned to teach integrated science because it is believed that he has a foundational knowledge Lawal (2013) indicated that skilled and effective teaching and learning are expected from professionally trained teachers.

Integrated Science teachers are expected to employ the use of teaching aids to supplement other methods, manage, and control their classes for effective learning of Integrated Science. The use of inappropriate methods could affect students' performance

in Integrated Science. Many of the Integrated Science teachers do not have a clear insight about the appropriate pedagogies to enhance Integrated Science teaching and learning. Most of the teachers resort to teaching with only one major teaching method which is the lecture or "chalk and talk" method in our Integrated Science classroom.

When a curriculum is developed but not adequately supported with appropriate, sufficient materials and information technology, and when teachers are not adequately trained to interpret the curriculum and to use and create learning materials, nothing will be accomplished and education will stagnate. Okwilagwe, (2012) and Kolawole, (2017) agree that there is a demand for a shift in the rethinking of curriculum content and ways in which students are taught. They observed that the uninspiring teaching methods adopted by science teachers have led to under- achievement of students in the sciences and integrated science in particular. These studies show that teachers shy away from learner-centered teaching methods especially innovative and activity oriented teaching methods but rely heavily on methods that are easy but most inadequate and inappropriate for teaching many science concepts. It is important that the problems militating against effective delivery of lessons in the classroom should be looked into since the quality of education is directly related to the quality of instruction in the classroom (Ochu, 2016). There is need to find out the factors militating against integrated science teachers' effectiveness in the classroom. The Federal Government in November, 2007 launched a new curriculum known as the new basic education curriculum for primary and junior

secondary schools. The new curriculum is said to address, among other things, issues of value re-orientation, poverty eradication, critical thinking, entrepreneurship and life skills.

Damole (2011) stated that 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 because science teaching is "somewhat on the downside in primary schools. The 9 years integrated Science and Technology Curriculum is therefore a restructuring and re-engineering of the revised core curriculum for Primary science and integrated science of Junior Secondary school currently in use. In the selection of content for the new Basic Technology curriculum, Globalization, Information and communication Technology (ICT) and Entrepreneurship were the three major issues considered to be crucial in the development of a child, important to the nation, and influencing the contemporary world of knowledge. Thus in the aspiration for identification with contemporary development globally, it has become inevitable for Nigeria to incorporate relevant content into the school curriculum.

These have been infused into every class of Basic 1-9. The objectives of the new Basic Education Curriculum in Science and Technology are also spelt out thus, to enable learners:

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 worthy of note that integrated Science and Technology offered at the lower and Middle Basic education stages are separated at the Upper Basic Education level. At the presentation of the new curriculum to Education stakeholders, at the Educational Research Centre in Abuja, the executive secretary to the Nigerian Educational Research and Development Council (NERDC), opined that the new curriculum sought to forestall the irregularities that marred the previous one. He observed that the former one fell short in the area of human capacity development.

He further stated that with proper implementation of the new curriculum, the students would not only interact properly, but would be better enabled to engender peace and development in our societies. Thus, if the new curriculum is optimally employed, our country would have succeeded in registering her name among the committee of scientifically and technologically self-reliant nations.

Statement of the Problem

The successful implementation of the Integrated Science curriculum in Junior Secondary Schools in Nigeria largely depends on the competence and preparedness of the teachers delivering the content. However, over the years, concerns have been raised about the inadequate implementation of this curriculum, often attributed to insufficient teacher

training, lack of continuous professional development, and poor mastery of integrated pedagogical approaches.

Many science teachers currently in the classroom were trained under specialized disciplines such as Biology, Chemistry, or Physics and may lack adequate exposure to the integrated approach emphasized in the curriculum. As a result, they may struggle to effectively combine concepts from multiple scientific disciplines, leading to fragmented teaching and reduced student understanding.

Moreover, limited access to updated instructional strategies, lack of hands-on training, and poor engagement with modern teaching aids have further compounded the problem. These gaps may significantly hinder the achievement of the curriculum's objectives, which are to promote scientific literacy, inquiry skills, and critical thinking among students at the junior secondary level.

Given the strategic role of science education in national development, it is imperative to assess whether teacher-training programs—both pre-service and in-service—are adequately equipping educators with the skills and knowledge required for effective curriculum implementation. Without such evaluation, the goals of the Integrated Science curriculum may remain largely unfulfilled. This study, therefore, seeks to investigate the impact of teacher training on the implementation of the Integrated Science curriculum in Junior Secondary Schools, with a view to identifying existing gaps and making recommendations for more effective delivery.

Purpose of the Study

The purpose of this study is to evaluate the impact of teacher training on the implementation of Integrated Science curriculum in Junior secondary school in Ovia North East L.G.A of Edo State. Specifically, the study to:

1. ascertain if inadequate implementation of this curriculum affect teaching of Integrated Science in Junior secondary school.
2. determine how the insufficient teacher training affect teaching of integrated science.
3. identify how poor mastery of integrated pedagogical approaches affect teaching of integrated science.
4. determine possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum in Junior secondary school.

Research Questions

The following research questions are raised to guide the study.

1. Does inadequate implementation of this curriculum affect teaching and learning of Integrated Science in Junior secondary school in Ovia North East L.G.A. Edo State?
2. How does the insufficient teachers' training affect teaching and learning of integrated science curriculum in Ovia North East Local Government Area, Edo State?

3. Does poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum in Ovia North East L.G.A, Edo State?
4. What are the possible measures that can be taken to minimize the poor teachers' training on the implementation of Integrated Science curriculum in junior secondary school in Ovia North East L.G.A. Edo State?

Significant of the Study

The present study is of great relevance to many. Beneficiaries of the findings of this work include teachers, students, curriculum planners, parents and other stakeholders in education.

The findings of the study will improve the teaching styles of teachers. They will be made aware of the importance of effective ways to reach different types of learners and assess student understanding through multiple means. Integrated science teachers will understand the importance of training and re-training themselves in order to enhance competency in the subject area. The training could be geared towards enhancement of relationship between teachers and students. Through this, teachers could become better advisers, content experts and coach and through such means, make teaching and learning more meaningful.

The findings of the study will help students to appreciate the importance of technology, deepen their interest in the subject, and help them to understand what skills they need to survive in a complex, technological knowledge based economy. Being aware of the challenges confronting teaching and learning of Basic Technology, students will be

better enabled to learn and easily refine their analysis and problem-solving skills. Also experiment and observe phenomenon and to view results in graphic ways that aid in understanding.

And, as an added benefit, findings will help students with technology tools and a project-learning approach. With these, students are more likely to stay engaged and on task, reducing behavioral problems in the classroom. Curriculum Planners like the Nigerian Educational Research and Development Council (NERDC) will benefit from this study.

Scope and Delimitation of the Study

The study aim at assessing the impact of teachers' training on the implantation of Integrated Science curriculum in junior secondary school in Ovia North East L.G.A of Edo State. The study will be delimited to junior secondary schools in Ovia North East Local Government Area of Edo state.

Operational Definition of Terms

Impact: To have a strong effect or influence on a situation or person. This is a process of making something less likely to happen or succeed.

Teachers Training: This means to impart knowledge to or to instruct someone as to do something. Teaching as a deliberate effort by a mature or experienced person to impart information, knowledge, values skills, norms (standard behavior) more (moral values) attitude language and so on to an immature or less experienced person through the process that is morally and pedagogically acceptable.

Implementation: It is the carrying out of planned, intentional activities that aim to turn evidence and ideas into policies and practices that work for people in the real world.

Integrated science: Integrated Science brings together many inclusive aspects of science that students will encounter in the high school science core curriculum.

Curriculum; It is a standards-based sequence of planned experiences where students practice and achieve proficiency in content and applied learning skills.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with the review of related literature on the impact of teachers' training on the implantation of Integrated Science curriculum in Junior secondary school in Ovia North East L.G.A, of Edo state. It shall be discussed under the following subheadings:

- Theoretical Framework
- Conceptual Framework
- Concept of Integrated Science
- Features of Teaching as a Profession
- Objectives for Teaching Integrated Science
- Factors Influencing Students Performance in Science
- Problems of Poor Teaching Integrated Science in secondary schools in Ovia North East Local Government Area, Edo State, Nigeria.
- Prospects for Integrated Science in Nigeria
- Summary of Literature Review.

Theoretical Framework

The theoretical framework of this study was based on Edgar Dale's cone of experiences (1986), Paget's cognitive development theory and Bruner's mode of representation. Edgar's theory tries to provide a solid psychological base for the modern

technologies through the cone of experience. This theory posits that individuals obtain experiences through the use of methods, materials and equipment used in the school which may be inform of hardware or software. The cone of experience comprises indirect and direct concrete experiences, real direct experience, demonstration, field trips, exhibition and contrived experiences. All these experiences are obtained through the use of direct and indirect resource materials in teaching in schools.

As the process progresses upwards the experience/learning gained decreased. The implication is that teachers should provide more experiences that would enable learners hear, say, see and do things or carry out activities. The younger the learners, the more abstract the experience they are exposed to. Paget's cognitive development theory highlights that experience could be of two types. The first one involves acting on objects to learn about them to determine which is heavier by comparing their weights. The second type of experience is learning derived from using the object example, whether ten pebbles are arranged in circles or in rows, they remain ten pebbles. Also the educational implications from Paget's preoperational stage in imitating, symbolic play, language acquisition, mental images and drawing justifies the need to use media like pictures, stories and films in order to boost children reasoning.

Similarly, Bruner's mode of representation would help teachers on how to present ideas to learners by adopting teaching to suit their mental stages. Bruner outline three modes of representation

Enactive mode: This mode refers to the stage at which the child knows the world only by acting on it, which is words cannot express an experience, it is leaning through direct experience.

Iconic modes: This refers to perceptual organization of a series of related things or ideas. They could be represented in pictures, drawing, films etc

Symbolic mode: At this stage, learners understand symbolic representation in language and mathematics. They also translate experience-using language and engage in critical and creative thinking.

These basic principles of gaining experience as enumerated in Dale's cone of experience, Paget's theory and Bruner's mode of representation calls for not only the use of media in teaching – learning but their appropriate use, hence, the theories are related to the study as the teaching of basic technology education is a practical subject. The students require live contact with the objects used in teaching. The stipulations of these theories will enable the teachers of basic technology to appreciate the use of workshop equipment, tools and facilities for teaching the students in the classroom. This will enable them to get firsthand information on what is taught. Furthermore, these theories will provide basic technology teachers certain principles, maximize teaching and learning for better understanding by the students as experience is the best teacher. These theories are therefore, essential in this study as they enable students and teachers to have life experiences of what is taught in the classroom.

Conceptual Framework

Education involves the teaching and learning activities, which are aimed at fulfilling individual as well as social needs and aspirations. The factors that can influence the quality, learning and level of achievement that can be produced by the resultant effect of the determination of the educational system and hence its products is determined very largely by the quality of the teachers, curriculum as well as methods and materials involved. Effective teaching of integrated science is an activity, which will bring about the most productive and beneficial learning experience for students and promote their development as learner

Adequate and appropriate use of instructional material ensures effective teaching and learning of science. Adequate instructional materials and strategies give students the chance to use their senses of hearing, smelling, tasting, seeing, and feeling (Opara & Etukudo, 2014). If instructional materials are inadequate, students are made to read textbooks while the teachers explain the concepts to them instead of the students carrying out activities as suggested by the integrated science curriculum (Azure, 2015). This deprives pupils of taking responsibility for their learning through active construction and reconstruction of their meanings for concepts and phenomena (Borich, 2017; Brass et al., 2013) hence their performance as compared to pupils with adequate facilities (Idiaghe, 2014).The benefits of the use of instructional materials in teaching and learning of science cannot be overemphasized. This is because as pupils become involved in science activities with the materials they understand scientific concepts better and ultimately

improve their performance. The ultimate goal of any instructional activity is to facilitate effective teaching and meaningful learning. The teacher is responsible for the translation and implementation of education policies, curriculum and instructional material package. When a curriculum is developed but not adequately supported with appropriate, sufficient materials and information technology, and when teachers are not adequately trained to interpret the curriculum and to use and create learning materials, nothing will be accomplished and education will stagnate.

Okwilagwe, (2012) and Kolawole, (2017) agree that there is a demand for a shift in the rethinking of curriculum content and ways in which students are taught. They observed that the uninspiring teaching methods adopted by science teachers have led to under-achievement of students in the sciences in particular. These studies show that teachers shy away from learner-centered teaching methods especially innovative and activity oriented teaching methods but rely heavily on methods that are easy but most inadequate and inappropriate for teaching many science concepts. The successful implementation of any curriculum and attainment of teaching goals depends primarily on the teacher. This is because no matter how laudable a curriculum plan is, its success depends primarily on the quality of teachers. For one to be a qualified teacher, the person must pass through teacher education programmes where the person undergoes some academic training to acquire knowledge in the subject area and some pedagogical skills.

Concept of Integrated Science

It is important that the problems militating against effective delivery of lessons in the classroom should be looked into since the quality of education is directly related to the quality of instruction in the classroom (Ochu, 2016). For the teaching of integrated science to be effective the integrated science teachers must have an extensive knowledge of the subject, knowledge of the curriculum, knowledge and understanding of how children develop and how they learn.

An integrated science teacher should possess some teaching skills and be able to plan lessons, manage a classroom, engage students in active learning, present challenging situations to encourage problems solving, collect and monitor information on achievement, maintain good students record, provide motivation for students and support cooperative group (Boulino 2018). The teacher and learner are the key partners in the educational process. They operate within environment and materials of the society.

Integrated science is one of the subjects whose teaching can hardly progress without the availability of enough instructional materials and other learning resources (Daniel, 2017). Relating to Ukeje (2018) the following questions are determined to create pathway leading to effective teaching and learning activities

- What should be taught?
- To whom it should be taught?
- Who should do the teaching?

The teacher factor is an indispensable determinant in the successful implementation of any curriculum Integrated Science is a way to study science. If the approach given to the study of science is such a way that we do not distinguish between the various sciences, we are said to have integrated or put together the various science disciplines. So that in our study of Integrated Science, we are not studying Physics, Chemistry, or Biology separately (Institute of Education, University of Ibadan, 2004). In a simple and in general terms, Bajah (1983) in Koko and Nwiyi, (2017), sees integrated science as only a way of teaching science. When science is taught in such a way as to present scientific ideas as a unified whole, then we say that the ideas have been integrated.

Integrated science is defined as a cumulative approach of scientific study that synthesizes the perspectives of the individual disciplines, and integrates them during all phases of the approach to a question or problem, with the results having an influence on policy and management decisions (Gallagher et. al. 2018). Integrated Science emphasizes the fundamental unity of science. It is a practical approach to the study of science. It is completely activity-based and student-centered. Howell (1970) in Koko and Nwiyi, (2017) wrote that Integrated Science is "the essence of a beginning course to teach learners what science is and how a scientist works". He regarded Integrated Science as some forms of unified science. Khabele (1975) in Koko and Nwiyi, (2017), on his part, drew attention to the UNESCO publication in which Integrated Science was defined as "and approach to the teaching of science in which concepts and principles are presented so as to express the fundamental unity of scientific thoughts and avoid Premature or undue stress on the

distinctions between the various scientific fields". Oraifo (1979) in Koko and Nwiyi, (2017), sees integrated science as an approach to the teaching of science in which concepts the fundamental unity of scientific thoughts and avoid premature or undue stress on the distinction between the various scientific fields

According to Ahabele (1975) cited in Koko and Nwiyi, (2017), integrated science is the most appropriate technique for young children and that the approach is suitable for junior schools. One can see a clear definition of integrated science as one study the ways different authors describe the discipline. Brown (1977) in Koko and Nwiyi, (2017) describes integrated science under four broad characteristics:

- The unity of all knowledge that integrated science has a holistic view of knowledge as essentially one and undivided;
- The conceptual unity of the sciences the various conceptual units that make up the framework are identified;
- A unified process of scientific enquiry this characteristic place emphasis on the methodological distinctions and similarities among the sciences;
- An interdisciplinary stud that the discipline is a collaborative venture between subjects and viewing of topics or themes from logically different viewpoints with the learner left to synthesize in any way he chooses.

Features of Teaching as a Profession

Teachers are the major factors in implementing the educational objectives and policies and, as such, should be respected and recognized in any country, because when something goes wrong within the educational system, the teachers are first to be blamed (Koko and Nwiyi, 2017). Teaching as a profession has the following Features according to Nemine (2018):

- Period of specialized training: Teachers go through formal school e.g. Colleges of Education, universities and other institutions running educational courses.
- Code of conduct: Teaching has its recognized code of professional ethics and conduct.
- Professional organization: Teaching has a body of professional colleagues who share the same ethical codes for instance ASUU in Universities and COEASU in Colleges of Education and the Nigerian Union of Teachers (NUT).
- Control of entry: Teaching, like every other profession, has control of entry. The Nigeria Certificate in Education is the least qualification for entry into the teaching profession in Nigeria teaching has autonomy and independence as a profession: It has the ability to exercise its own leadership and pursue goals for the general welfare of its members and the development of the body.
- Professional qualification and teaching competencies: Banjo in Ololube (2019), opined that mediocrity in education is unacceptable and it is not in the best interest of both students and the larger world. Teachers have to be academically qualified as well as professionally competent to be able to perform their

prescribed roles. Again, the establishment of Teachers Registration Council is a contributing factor that, professionalized teaching for effective teaching and learning.

Objectives for Teaching Integrated Science

Projects and curriculum reforms in science education had been efforts to teach science in such a way as to increase scientific literacy in Nigeria. It was also geared toward becoming technological develop Integrated Science as a curriculum was a welcome development to attaining the set aims and objectives of a national yearn toward scientific advancement. When Sputnik was launched, there were global overhaul of science curricula from mere learning and memorizing of the laws and principles of science to doing science and enjoying its benefits.

Factors Influencing Students Performance in Science

Quality of Teaching

Inadequate teaching has been advanced as one of the problems of science education in Nigerian secondary schools. Quality science teaching is effective science teaching. Effective teaching occurs when students learn and achieve many scientific goals and not just being able to repeat scientific knowledge (Omoifo, 2012). During effective learning, student learn how to learn, students develop conceptual understanding and thinking skills, thus helping students change their intuitive, everyday ways of explaining the world around them to incorporate scientific concepts and ways of thinking into their personal frameworks. Therefore students' ability to solve problems and perhaps enhanced

learning occurs. According to Okafor, (2017), quality 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. Ayodele (2016) 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 (2019) 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 (2017) and Ogbeba (2019). Observed that most teacher's 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 (2013), 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. There are also few traditional hands- on (practical) classes. Our science lessons are yet to be structured, guided and students directed. (Omoifo, 2012).

Quality of Teachers

Poor quality of science teachers in terms of adequate knowledge base and pedagogic skills is another factor identified to influence students' performance. The teacher's academic qualifications and knowledge of subject matter, competencies and skills, and the commitment of teacher have a great impact on the teaching learning process. A science teacher is anyone who teaches science. Science teachers in Nigeria are prepared mainly at colleges of Education and faculties of Education of different universities. Achieving the goals of science education requires qualified and highly scientifically literate teachers.

Okureme (2013) posited that: An effective science teacher should be a master of his subject, as well as grounded in methods of teaching and be able to relate the science concepts to real life experience. Abd–El-phallic and Boulaoude (2017) conceived such teachers as those who understand the concepts, principles, theories and processes of science and are aware of the complex relationship between science, technology and society. Such teachers more importantly must develop an understanding of the Nature of Science. This is important because the portion of scientific knowledge science teachers choose to teach and how they carry out the instruction presents a particular view of the nature of science to their students. (Omoifo, 2012).

The teacher knowledge base for effective science teaching is very important in that they are to help the students completely understand the content and underlying philosophy of science. This has long been stressed and culminated in recent emphasis on teacher preparation programmes that will produce sound and effective scientifically

literate teachers. Different studies showed that the most important resource input in the school that predicts student achievement is Teacher Quality and effective teacher will have students with good test score (Dahar, Dahar, Dahar and Faize, 2019). The five indicators of teacher quality according to Dahar et al (2019) are academic qualification, professional qualification, in-service refresher courses and trainings, teacher experience and teacher salary.

Academic Qualification of Teachers

This is in line with the guideline of National Policy on Education (FRN, 2004) section 8; sub-section 70B which outlined that the minimum teaching qualification into the teaching profession shall be Nigeria Certificate in Education (NCE). This is a proof that teaching is professionalized in Nigeria. The National Policy on Education (FRN, 2004) section 8, sub-section 74 and 75 outlined that: Teacher education shall continue to take cognizance of changes in methodology and in the curriculum. Teachers shall be regularly exposed to innovations in their profession; in- service training shall be developed as an integral part of continuing teacher education.

Academic qualification is a very important quality of a teacher. Academically qualified teacher has move authentic knowledge about the relevant subject than the academically less qualified teacher has Nigerian Science Teachers. Molnar (2002) reported some studies in which students taught by certified teachers consistently outscored those taught by uncertified teachers. He posited that a poorly trained teacher will likely produce a poor doctor, engineer, architect, fellow teacher and the like.

Professional Qualification of Teachers

Professional qualification can be termed as the preparation for life long journey into the teaching profession. The basic skills and abilities of the teaching learning process are developed in a teacher through professional qualification. Professional qualification can be categorized into pre-service and in-service professional qualification. The National Policy on Education (2004) in section 6:70b states that the qualification for entry into the teaching profession shall be the Nigeria certificate in education (NCE)". Omayuli and Omayuli, (2019) posited that most of the science teachers are also not professionally trained. To the extent that an engineer is recruited to teach Mathematics, Physics and Chemistry, rather than specialists actually trained to teach the subjects. Ukeje (2016) asserts that, teachers are the foundation of quality in the schools. It is their quality, efficiency and effectiveness that the future of organized education depends. It is the teacher who according to him, in the final analysis, translates principles, policies and ideals into action. The effective Implementation of science and technology education programmes therefore, depend on the supply of adequate and well-qualified teachers as no system of education can rise above the quality of its teachers (Federal Republic of Nigeria, 2004). Unfortunately, however, many researchers (Ifejiaka, 2017; Akale, 2016) have reported that in Nigeria there is a dearth of qualified and well –trained science and technology teachers

Teaching Experience of Teachers

Teaching experience is the time spent by a teacher in the teaching profession. With the passage of time teachers get command of their subjects and become competent in the art of teaching through experience. In other words, teaching experience improves the teaching skills and methodologies adopted.

Teacher's Salary

Teacher salary is very important as a predictor of student's achievement because it has a capacity to uplift the other aspects of teacher quality. If a teacher gets a suitable salary that covers the basic living costs, he may be able to live comfortably and thus be more effective as he is motivated to use his abilities, competencies and skills. Poor remuneration affects the morale of teachers, distracts and hinders their commitment and effectiveness.

In-Service Refresher Courses and Training

Over the years, the interplay of politics and economics on teacher training policies led to some degree of compromise in admission requirements. Consequently, a large proportion of what we have today as trained science teachers are professionally incompetent. This fact prompted Aluede (2013) to say that the general deterioration and collapse of the educational system have resulted in a guild of teachers who are unqualified and even uncommitted to leading the learners to expected destination. Odia and Omonfonmwan (2017) opined that the teacher training institutions have tended to produce teachers that are inadequate in terms of knowledge of subject matter and pedagogic skills. The quality of teachers is dependent on the nature of their preparation

and training. In-service education and training is a continuous on-going process for teachers throughout their professional life. It may be provided at any time between joining the service until retirement.

Okhiku, (2015) summarized in-service training as all the activities, planned and structured engaged in by professionals (teachers) during their service aimed at helping the teacher to acquire basic skills for the efficient execution of the functions for which he was employed. As noted by Ajayi (1998) in Okhiku (2015), teachers are not finished products even after the completion of a preparation or pre-service programme. Science teachers are faced with the challenge of meeting with new innovations in science. It was in recognition of this fact, that it was stated in section 6:70b of the NPE that "Teachers shall be regularly exposed to innovations in their profession. Also In-service training shall be developed as an integral part of continuing teacher education and also take care of all inadequacies.

Quality Teaching Learning Resource

Lack of ideal resources for science teaching and learning in Nigerian schools has been a major issue of concern. It is a well-known fact that the quality of education a student receives largely depends on the quality of teaching/learning resources provided. Teaching learning resources are all the things used by the teacher during teaching to aid understanding and make teaching successful and effective. They include modern textbooks, equipment's, consumables like chemicals and reagents, models, charts etc. and the physical learning environments, which include the science classrooms and

laboratories. One of the major objective of science education is to teach students the scientific process. Students need some investigative skills such as observing, measuring, classifying recording experimenting, analyzing inferring, etc. To achieve this, science classrooms, laboratories and the general learning environment must be adequate and conducive. Inquiry focused science teaching demands a lot of activities on the part of the learner that require scientific materials and equipment. Due to the fact that majority of schools lack the essential resources for imparting the knowledge of science concepts to students, many students learn little science, learning tends to be by rote and many students find science not interesting and boring (Ogunmade, 2016).

The teacher student interactions in many science classrooms are not healthy because of lack of adequate resources. 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 (Audu and Oghogho, 2016). The situation in many science classrooms in Nigeria is nothing to write home about. In many schools there are no laboratories. Some schools merely have empty rooms labeled laboratories. Students rarely have hands-on, minds-on experiences. Few days to science practical examinations, most schools acquire science equipments for teacher demonstration to students. This cannot make for effective learning and eventually results in poor achievement (Omoifo, 2012). To worsen the problem of lack of or inadequate resources, the few available ones are not properly maintained, protected and cared for. Ogunmade (2016) stated that

“majority of students do not have textbooks and most of the schools do not have libraries and where they have one, the textbooks in the libraries are outdated.

Adequate and appropriate use of instructional material ensures effective teaching and learning of science. Adequate instructional materials and strategies give students the chance to use their senses of hearing, smelling, tasting, seeing, and feeling (Opara & Etukudo, 2014). If instructional materials are inadequate, students are made to read textbooks while the teachers explain the concepts to them instead of the students carrying out activities as suggested by the integrated science curriculum (Azure, 2015). This deprives pupils of taking responsibility for their learning through active construction and Reconstruction of their meanings for concepts and phenomena (Borich, 2017; Brass et al., 2013) hence their performance as compared to pupils with adequate facilities (Idiaghe, 2014).The benefits of the use of instructional materials in teaching and learning of science cannot be overemphasized. This is because as pupils become involved in science activities with the materials they understand scientific concepts better and ultimately improve their performance.

The Use of Teaching Materials

Teaching materials play an important role in promoting English language use. There are three kinds of teaching materials: text-based, task-based, and realia. These can be textbooks, games, role plays, simulations, and task-based communication activities designed to support communicative language teaching. Different kinds of authentic objects can be used in an integrated science class to support practical activities, from

language-based realia such as signs, magazines, and newspapers to graphic and visual sources such as maps, pictures, symbols, graphs, and charts (Richards, 2001). The use of teaching materials has a major impact on the activity of science teaching. Abebe and Davidson (2012) point out that student are eager to learn vocabulary with the assistance of visual materials, and that the use of visual materials enhances the students' ability and opportunity to use language to express their ideas and feelings.

However, Abebe and Davidson (2012) also found that teachers rarely use visual materials such as cards, charts, and real objects in teaching, despite the majority of teachers and students admitting that visual materials help students learn language effectively. Mathew and Alidmat (2013) agree that teacher's use of audio-visual aids helps students to understand lessons more and improves their integrated science skills, such as practical knowledge and conversational skills, through listening to native speakers. In addition, the use of audio-visual materials also helps to make classroom activities more interesting and helps the students to remember the lessons longer. A study conducted by Aduwa-Ogiegbaen and Iyamu (2016) found that textbooks, workbooks, dictionaries, chalkboards, and posters are dominant in integrated science classrooms, whereas modern media such as audio and video, programmed texts, language laboratories, flashcards, computers, magazines, and newspapers are rarely used. In brief, considerable research relating to English teaching has been conducted in a number of countries, including Vietnam. However, few of these studies have been conducted at a particular Vietnamese higher education institution. Therefore, it was necessary to conduct further

research, and this study provides a snapshot of integrated science training in Vietnamese higher education by focusing on HUTECH University (HUTECH) as a case study. The results of this study provide evidence that teachers can use to adjust their teaching activities, and university leaders can develop appropriate strategies to make science teaching and learning more effective.

The Problem of Large Class and Inadequate Teaching Resources

Chen and Goh in their research, the problem which the teachers encounter in teaching integrated science as a science study context to include external constraints such as large class sizes and a lack of teaching resources: and teachers' low self-efficacy with regard to science proficiency and inadequate practical knowledge. They believe that teachers should receive training in how to design and implement effective tasks to motivate students' engagement.

Problems of Poor Teaching of Integrated Science in Secondary Schools in Ovia North East Local Government Area, Edo State, Nigeria

In his presidential address at the 24th Annual Conference of the Science Teachers Association of Nigeria (STAN) in Jos, 1984, Dr. S.T. Bajah gave a contextual appraisal of integrated science in Nigeria and referred to the situation as a crisis in our classrooms. According to him, the science teacher who in the first lesson on integrated science wrote boldly on the chalkboard "INTERGRATED SCIENCE" began the crisis in the classroom. Superficially, one would think that this is crisis of words. The question is why many teachers would call the course 'Integrated Science' instead of 'Integrated Science?' The

fact of the matter is that most teachers do not just know what exactly this 'Integrated Science' is all about. I would like to add that most of the problems arise as a result of the inappropriate training background of our science teachers which is not quite adequate for teaching integrated science. A curriculum programme may have the right objectives and appropriate suggestions for practical work. But if the teacher does not apply the required methods to teach the course, then such malpractice soon defeats the objectives and skill, innovation, open-ended experimentation and individual ingenuity of students. Integrated science is 'Science come alive.' It is meant to unite all of us who have specialized disciplines in science. This means that any method applied in teaching integrated science must strive to instill in the students the practical utility and application of the knowledge in everyday life.

Admittedly, any child-centered activity-oriented curriculum requires adequate financial expenditure in terms of purchases of working material and provision of adequately trained personnel. Obviously, one of the problems of teaching integrated science in our schools stem from the inadequacy of laboratory facilities. There is no doubt, that there would be some devoted integrated science teachers in some schools, but in the midst of inadequate working material, they would have been frustrated in their efforts to do it. The problems of inadequate or complete absence of physical facilities are even compounded by the phenomenal increase in school enrolments resulting to the problem of large class-size. Some students on the evaluation of integrated science

projects, Jegede's (1982) in Gbamaja (2016) reported that new curricular materials developed in Africa have low levels of readability.

The 'teacher factor' is also an indispensable determinant in the successful implementation of any curriculum innovation. As succinctly stated by Stake et al. (1978) in Gbamaja (2016) states what integrated science will be for any one child for any one year, is most dependent on what that child's teacher believes, knows and does-or does not believe, does not know and does not do. For, essentially all of the science learned in school, the teacher is the enabler, the inspiration and the constraint. Integrated science teaching in Nigeria is entrusted into the hands of those teachers majority of who are not qualified to teach the course. Perhaps one main reason why some people look at the future of integrated science as being blurred is the fact that the major focus of secondary school education in general is the West African School Certificate Examination and G.C.E. It appears to the people as if integrated science is inadequate for preparation for the terminal examination. But this is not so, because integrated science has many prospects as far as education and job prospect is concerned.

Prospects for Integrated Science in Nigeria

Nigeria has been noted for being in the forefront in the wholesale adoption of integrated science at junior secondary school level. The magnitude of prospects for integrated science in Nigeria and the world over cannot be overemphasized. There is a universal rush to integrated science at the junior secondary school level, and reportedly many developed countries have included integrated science in the syllabus at the upper

secondary school level and at the tertiary level. There is a universal pressure for nations to develop scientific knowledge in the societies. In this vein, the need for many professional people to be knowledgeable in several areas, the occurrence of problems that can be solved only by co-ordination of research in several specialties and the demands of students, particularly non-science students, for an understanding of the role of science in modern society, have provided strong pressure for less specialization and the presentation of wider views of science which integrated science can provide. Because of this pressure, many African countries today are exploring the feasibility of implementing integrated science at all levels of the education system.

Critics might say that the course is not suitable for advanced work. But the truth is that the junior course could be revised to suit any advanced study as several developed countries have done. The important thing is to make science unified and break the subject boundaries. This move has been achieved in many advanced countries such as the United States of America, Britain, the Caribbean, Australia, and other places. The Caribbean Integrated Science Curriculum (CISC), The United States' BSCS Biology, PSSC Physics, Harvard Project Physics, CHEM Study, and Britain's "O" and" level courses in the various individual sciences have made a significant contribution towards the possibility of meaningful integrated science at the upper secondary and tertiary levels. These courses share an increased emphasis on the laboratory approach, a concern for the learner, and a carefully thought-out consideration of the modern nature and scope of the discipline and its relation to science as a whole. Thus, they provide the most useful source of activities,

ideas, and approaches for those planning the development of truly integrated science courses at the upper-secondary level (Richmond 1973). The West African Examination Council has already had several dialogues with Science Teachers Association of Nigeria (STAN) on the feasibility of extending integrated science to the senior secondary school level. Other West African countries too, for example, Sierra Leone and Ghana are making similar moves.

Gbamaja (2016) compared the Sierra Leone integrated science programme (core course Integrated Science) for the junior secondary level with some aspects of WAEC Science Syllabus and found that the difference is minimal in terms of content and he suggested ways of extending integrated science to the senior secondary level. Further, Gbamanja (2011) reported that the fact that integrated science ends at the junior secondary school level and does not extend to the senior segment causes a swing away from science. The inquiry/discovery activity skills which they acquired in the integrated science courses are in the senior secondary school as they prepare for the all important school certificate examination and G.C.E. Moreover the Universal Basic Education has coined integrated science in place of integrated science to cater for both practical and theoretical aspects of science at primary and junior secondary schools in Nigeria.

Summary of Reviewed Literature

Integrated science curriculum play a significant role in shaping science students' academic performance in public junior secondary schools. A well implemented integrated science curriculum fosters focus, effective learning, and positive attitudes toward

education. Conversely, the prevalence of subject challenges—such as poor teaching method, unqualified teachers, unconducive environment and classroom disruptions—can detract from both the teaching process and students' ability to learn effectively, problems of poor teaching of integrated science in secondary schools, factors influencing students' performance in Science, prospects for integrated science were all discussed in the study.

CHAPTER THREE

METHODOLOGY

This chapter described the research method used in this study, and discussed under the following sub-headings:

- Design of the Study
- Population of the Study
- Sample and Sampling Technique
- Research Instrumentation
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis.

Design of the Study

The descriptive survey research design was adopted for this study. This involved the process of identifying the variables that exist in a given situation and describing the relationship that exist among the variables, as well as examining the factors that link these variables together.

Population of the Study

The population of this study comprised of thirteen (13) public junior secondary schools in Ovia North East Local Government Area of Edo State. The respondents was

two hundred and fifty (250) public junior secondary school teachers in Ovia North East Local Government Area in Edo State. (Ministry of Education 2025, Benin City).

Table 1; Population Distribution

S/N	Name of School	Population
1.	Ekosodin Secondary School	21
2.	Ezomo College	19
3.	Ebomosi Secondary School	19
4.	Nifor Secondary School	17
5.	Odighi Grammar School	18
6.	Army Day Secondary School	18
7.	Iguadolor Secondary School	24
8.	Utese Secondary School	17
9.	Utoka Grammar School	20
10.	Okada Uram School	18
11.	Osasimwoba Secondary School	19
12.	Ise Girls School	22
13.	Oba-Erediauwa Secondary School	19
	Total	**250**

(Source: Ovia North East Secretariat, 2025).

Sample and Sampling Procedure

The sample size of five (5) schools was selected using the simple random sampling technique and thirty (30) teachers were chosen from each sampled school making one hundred and fifty (150) teachers as respondents using convenience sampling technique.

Research Instrument

The research instrument used for collection of data was a questionnaire titled, "**Impact of Teacher Training on the Implantation of Integrated Science Curriculum in Junior Secondary School Questionnaire (ITTIISCJSSQ)".** It comprises of two sections; Section A and B; Section A was designed to generate information from the impact of teacher training on the implementation of Integrated Science curriculum in Junior secondary school as regards their demography. While Section B consisted of questions drawn from the research questions on the impact of teacher training on the implantation of Integrated Science curriculum in Junior secondary school in Ovia North East comprised of 20 items, which were closed-ended. Questions were raised in each of the research questions where the respondents was required to select the most appropriate options. The responses are rated on a four (4) point Likert scale ranging from Strongly Agree (SA) Agree (A); Disagree (D); and Strongly Disagree (SD).

Validity of the Instrument

The research instrument for this study was subjected to his supervisor and other 2 two lecturers from Curriculum and Instructional Technology, Faculty of Education,

University of Benin for validation. The comments, suggestions and corrections from the supervisor was effected in the final draft of the instrument.

Reliability of the Instrument

The reliability of the research instrument was done using test-retest reliability technique. This was done by administering the research instrument to 20 teachers that is not part of the study population. The instrument was administered twice to each respondent at an interval of two weeks. Thereafter, the reliability of the instrument was ascertained using Pearson Moment Coefficient Correlation. A reliability coefficient value of 0.76 was obtained, which indicated that the instrument is reliable or not.

Methods of Data Collection

Questionnaires were administered to teachers' in Ovia North East public junior secondary schools and on the spot retrieval of the completed questionnaires were collected.

Method of Data Analysis

Data collected from the respondents was analyzed using descriptive statistics such as frequency counts and simple percentage.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter focused on the presentation of results from the analysis of data obtained and discussion of the findings.

Research Question 1: Does inadequate implementation of this curriculum affect teaching and learning of Integrated Science in junior secondary school in Ovia North East L.G.A. Edo State?

Table 3: Inadequate Implementation of Curriculum in Teaching and Learning of Integrated Science in Junior Secondary School

	Inadequate Implementation	Agree	%	Disagree	%	Mean	Decision
1	When Integrated Science curriculum is not properly implemented, students fail to achieve the intended learning objectives.	128	85	22	15	3.12	Accepted
2	Inadequate implementation limits students' opportunities for practical work, resulting in poor understanding of scientific concepts.	146	97	4	3	2.98	Accepted
3	If teachers are not well trained with adequate teaching aids and resources, they cannot effectively deliver the content.	134	89	16	11	3.23	Accepted
4	When lessons are theory-based and lack	142	95	8	5	2.76	Accepted

	interactive or practical elements due to poor implementation, students often lose interest.						
5	Inadequate implementation causes disparities between schools.	132	88	18	12	3.01	Accepted
	Average Mean					**3.02**	**Accepted**

Note: N (Sample Size), Bench Mark 2.50

Table 3 revealed that inadequate implementation affect teaching and learning of integrated science**.** It was discovered that majority, 85% of the respondents agree that when Integrated Science curriculum is not properly implemented, students fail to achieve the intended learning objectives, while the remaining 15% disagree, in item 2, 97% of the respondents agree that inadequate implementation limits students' opportunities for practical work, resulting in poor understanding of scientific concepts, while the remaining 3% disagree. In item 3, 89% of the respondents agree that if teachers are not well trained with adequate teaching aids and resources, they cannot effectively deliver the content, while the remaining 11% disagree. In item 4, 95% of the respondents agree that when lessons are theory-based and lack interactive or practical elements due to poor implementation, students often lose interest while the remaining 5% disagree. In item 5, it was also seen 88% of the respondents admitted that inadequate implementation causes disparities between schools, while the remaining 12% disagreed. It is therefore concluded that inadequate implementation of curriculum affect teaching and learning of Integrated Science in junior secondary school.

Research Question 2: How does the insufficient teacher training affect teaching and learning of integrated science curriculum in Ovia North East Local Government Area, Edo State?

Table 4: Insufficient Teacher Training and Its Effect on Teaching and Learning Integrated Science in Junior secondary school

	Insufficient Teacher Training	Agree	%	Disagree	%	Mean	Decision
6	Insufficient teacher training greatly affects the teaching and learning of the Integrated Science curriculum.	120	80	30	20	2.85	Accepted
7	When teachers are not adequately trained, they often lack the necessary content knowledge, and practical experience required to effectively deliver science lessons.	125	83	25	17	2.87	Accepted
8	Untrained or undertrained teachers may avoid practical work due to a lack of skills in handling laboratory equipment.	128	85	22	15	2.89	Accepted
9	Insufficient teacher training leads to the use of outdated or inappropriate teaching strategies.	142	95	8	5	3.12	Accepted
10	Insufficient teachers contributes to poor academic performance and weak scientific literacy.	123	82	27	18	2.86	Accepted
Average Mean						**2.91**	**Accepted**

Note: N (Sample Size), Bench Mark 2.50

From Table 4 revealed the insufficient teacher training and its effect on teaching and learning of integrated science, 80% of the respondents agree that insufficient teacher training greatly affects the teaching and learning of the Integrated Science curriculum, while the remaining 15% disagree, in item 7, 97% of the respondents agree that when teachers are not adequately trained, they often lack the necessary content knowledge, and practical experience required to effectively deliver science lessons. While the remaining 3% disagreed. In item 8, 89% of the respondents agree that untrained or undertrained teachers may avoid practical work due to a lack of skills in handling laboratory equipment, while the remaining 11% disagree. In item 9, 95% of the respondents agree that insufficient teacher training leads to the use of outdated or inappropriate teaching strategies, while the remaining 5% disagreed. In item 10, 82% of the respondents agree that insufficient teachers contributes to poor academic performance and weak scientific literacy, while the remaining 5% disagreed. It is therefore concluded that insufficient teachers contributes to poor academic performance and weak scientific literacy.

Research Question 3: Does poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum in Ovia North East L.G.A, Edo State?

Table 5: Poor Mastery of Integrated Pedagogical Approaches Affect Teaching And Learning Of Integrated Science Curriculum.

	Poor Mastery of Integrated Science	Agree	%	Disagree	%	Mean	Decision
11	Poor mastery of integrated pedagogical approaches has a significant negative impact on the teaching and learning of the Integrated Science curriculum.	142	95	8	5	3.12	Accepted
12	Integrated Science requires teachers to use interdisciplinary and learner-centered methods that relate them to real-life situations.	132	88	18	12	3.02	Accepted
13	When teachers lack mastery of these pedagogical approaches, they often rely on traditional lecture methods that promote rote learning instead of inquiry-based, exploratory, and problem-solving strategies.	125	83	25	17	2.89	Accepted
14	Poor mastery of integrated science makes science lessons less engaging, less practical, and more abstract for students.	128	85	22	15	2.95	Accepted
15	Students fail to see the connections between scientific concepts and their daily experiences, which reduces their interest and motivation to learn.	142	95	8	5	3.12	Accepted
Average Mean						**3.02**	**Accepted**

Note: N (Sample Size), Bench Mark 2.50

The data from Table 5 revealed that poor masterly of integrated science pedagogical approaches affect integrated science, 95% of the respondents agree that poor mastery of integrated pedagogical approaches has a significant negative impact on the teaching and learning of the Integrated Science curriculum while the remaining 5% disagree, in item 12, 88% of the respondents agree that integrated Science requires teachers to use interdisciplinary and learner-centered methods that relate them to real-life situations, while the remaining 12% had a different opinion. In item 13 83% of the respondents agree that when teachers lack mastery of these pedagogical approaches, they often rely on traditional lecture methods that promote rote learning instead of inquiry-based, exploratory, and problem-solving strategies, while the remaining 17% disagree. In item 14, 95% of the respondents agree that poor mastery of integrated science makes science lessons less engaging, less practical, and more abstract for students, while the remaining 15%. In item 15, 95% of the respondents agree that students fail to see the connections between scientific concepts and their daily experiences, which reduces their interest and motivation to learn, while the remaining 5%. It is therefore concluded that poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum.

Research Question 4: What are the possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum in Junior secondary school in Ovia North East L.G.A. Edo State?

Table 6: Possible Measures that can be Taken to Minimize the Poor Teacher Training on the Implementation of Integrated Science Curriculum

	Possible Measures	Agree	%	Disagree	%	Mean	Decision
16	Organize periodic in-service training, seminars, and workshops to update teachers on current trends for implementing the Integrated Science curriculum.	131	87	19	13	2.95	Accepted
17	Well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments.	97	65	53	35	2.51	Accepted
18	Experienced science teachers should mentor newly qualified or less experienced ones.	122	81	28	19	2.88	Accepted
19	Educational supervisors and curriculum officers should monitor classroom practices regularly, and support teachers in implementing the curriculum effectively.	128	85	22	15	2.91	Accepted
20	Revise and improve teacher education curricula in colleges of education and universities to include more practical and integrated approaches to science teaching.	132	88	18	12	2.96	Accepted
Average Mean						**2.84**	**Accepted**

Note: N (Sample Size), Bench Mark 2.50

The data from Table 6 revealed the possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum. It was discovered that majority, 87% of the respondents agree that organize periodic in-service training, seminars, and workshops to update teachers on current trends for implementing the Integrated Science curriculum. In item 17, 65% of the respondents agree that well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments, while the remaining 35% had a different opinion. In item 18, 81% of the respondents agree that experienced science teachers should mentor newly qualified or less experienced ones, while the remaining 19% disagree. In item 19, 85% of the respondents agree that educational supervisors and curriculum officers should monitor classroom practices regularly, and support teachers in implementing the curriculum effectively, while the remaining 15%. In item 20, 88% of the respondents agree that revise and improve teacher education curricula in colleges of education and universities to include more practical and integrated approaches to science teaching, while the remaining 12%. It is therefore concluded that there are possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum such as organize periodic in-service training, seminars, and workshops to update teachers on current trends well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments and many more.

Discussion of Findings

Research question one how inadequate implementation affect teaching and learning of integrated science. The finding revealed that inadequate implementation of curriculum affect teaching and learning of Integrated Science in Junior secondary school. This finding corroborates with that of Azure (2017) opined that if instructional materials are inadequate, students are made to read textbooks while the teachers explain the concepts to them instead of the students carrying out activities as suggested by the integrated science curriculum. When a curriculum is developed but not adequately supported with appropriate, sufficient materials and information technology, and when teachers are not adequately trained to interpret the curriculum and to use and create learning materials, nothing will be accomplished and education will stagnate.

Research question 2 on the insufficient teacher training and its effect on teaching and learning of integrated science, findings from the study revealed that insufficient teachers training contributes to poor academic performance and weak scientific literacy. This finding is corroborated with the finding of Kimiti and Mwova (2017) in Kenya where they found that students were influenced by their peers in a variety of ways such as peer counselling, peer interaction, peer advice and peer relationships. Odirile (2017) stated that peer counselling is a way of relating, responding and helping aimed at

exploring feelings, thoughts and concerns with the hope of reaching a clear understanding. Kiuru (2018) also revealed the importance of peer interaction in Finland when he stated that the academic orientation typical of the peer group to which they belong may potentially have a long term impact on individual adolescents' vocational careers.

Research question 3 on poor mastery of integrated pedagogical approaches and it effect on teaching and learning of integrated science curriculum., findings from the study revealed that poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum.. The finding corroborates that of Odia and Omonfonmwan (2017) opined that the teacher training institutions have tended to produce teachers that are inadequate in terms of knowledge of subject matter and pedagogic skills. The quality of teachers is dependent on the nature of their preparation and training. In-service education and training is a continuous on-going process for teachers throughout their professional life. It may be provided at any time between joining the service until retirement. Okhiku, (2016) summarized in-service training as all the activities, planned and structured engaged in by professionals (teachers) during their service aimed at helping the teacher to acquire basic skills for the efficient execution of the functions for which he was employed.

Furthermore, research question 4, on the possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum, findings from the study revealed that possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science

curriculum such as organize periodic in-service training, seminars, and workshops to update teachers on current trends well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments and many more**..** This finding is in agreement with the finding of Opara and Etukudo (2016) stated that adequate and appropriate use of instructional material ensures effective teaching and learning of science. Adequate instructional materials and strategies give students the chance to use their senses of hearing, smelling, tasting, seeing, and feeling. Child-centered activity-oriented curriculum requires adequate financial expenditure in terms of purchases of working material and provision of adequately trained personnel.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter focused on the summary of the study, conclusion and recommendations.

Summary

This study evaluated the impact of teacher training on the implementation of Integrated Science curriculum in junior secondary school in Ovia North East L.G.A of Edo State. Four research questions were raised to guide this study. The study adopted descriptive survey research design. The population of this study comprises of thirteen (13) public junior secondary schools with two hundred and fifty (250) teachers in Ovia North East Local Government Area of Edo State. The respondents were the one hundred and fifty (150) public junior secondary school teachers in Ovia North East Local Government Area in Edo State. The sample size of five (5) schools was selected using the simple random sampling technique and thirty (30) teachers were selected from each sampled school making one hundred and fifty (150) teachers as respondents using convenience sampling technique. The instrument used for data collection is a self-constructed questionnaire. The measuring instrument for this study was subjected to her supervisor for validation. The comments, suggestions and corrections from the supervisor were

effected in the final draft of the instrument. The data gathered was analysed using percentages and frequency counts.

Findings

1. Inadequate implementation of curriculum affect teaching and learning of Integrated Science in Junior secondary school.
2. Insufficient teachers' training contributes to poor academic performance and weak scientific literacy.
3. Poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum.
4. There are possible measures that can be taken to minimize the poor teachers' training on the implementation of Integrated Science curriculum such as organize periodic in-service training, seminars, and workshops to update teachers on current trends well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments and many more.

Conclusion

Teachers' training plays a critical and transformative role in the successful implementation of the Integrated Science curriculum in Junior Secondary Schools. Evidence from research and field reports shows that teachers who undergo adequate pre-service and in-service training demonstrate better mastery of subject matter, improved

pedagogical skills, and a stronger ability to use inquiry-based and learner-centered strategies required by the curriculum.

Well-trained teachers are more confident, more innovative, and more capable of improvising instructional materials—an important requirement in resource-constrained environments. Conversely, inadequate training leads to shallow content delivery, over-reliance on lecture methods, poor practical engagements, and failure to effectively integrate science concepts. Therefore, the level and quality of teacher training directly determine whether students experience Integrated Science as a hands-on, activity-based, and problem-solving subject or simply theory-driven instruction. In essence, the implementation of the Integrated Science curriculum is only as strong as the teachers who deliver it, making teacher training a central pillar of curriculum success.

Recommendations

Based on the findings stated above, the following recommendations were made;

1. Colleges of Education and universities should update Integrated Science teacher-education curricula to reflect current trends in science education, inquiry-based learning, and ICT integration.
2. Ministries of Education should organize periodic workshops, seminars, and refresher courses on new teaching methods, curriculum changes, assessment strategies, and practical science activities.
3. Government and school administrators should supply adequate laboratory materials, equipment, and ICT tools.

4. Professional development should focus not only on content but also on how to teach integrated concepts effectively.
5. Schools should create platforms where Integrated Science teachers can share challenges, lesson plans, teaching aids, and innovative ideas.

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APPENDIX

UNIVERSITY OF BENIN,
BENIN CITY,

IMPACT OF TEACHER TRAINING ON THE IMPLEMENTATION OF INTEGRATED SCIENCE CURRICULUM QUESTIONNAIRE (ITTIISCQ)

Dear Respondent,

I am a final year student of the above named institution and I am carrying out a research work on: **"**impact of teacher training on the implementation of Integrated Science curriculum in Junior secondary school in Ovia North East Local government area of Edo State.**"** I kindly request that you provide me with the following information to enable me carry out this study. The information provided here is strictly for the purpose of academic research and will be treated with utmost confidentiality. Hence, you need not to write your name.

Researcher

SECTION A: DEMOGRAPHIC (To be filled by Teachers)

Instruction: Fill the blank space

Name of School……

SECTION B (To be Answered by Teachers)

Key: SA – Strongly Agree
A – Agree
D – Disagree
SD – Strongly Disagree

Instruction: Please kindly indicate by ticking appropriate place using (√)

S/N	Items	SA	A	D	SD
A	**Does inadequate implementation of this curriculum affect teaching and learning of Integrated Science in Junior secondary school in Ovia North East L.G.A. Edo state?**				
1.	When Integrated Science curriculum is not properly implemented, students fail to achieve the intended learning objectives.				
2.	Inadequate implementation limits students' opportunities for practical work, resulting in poor understanding of scientific concepts.				
3.	If teachers are not well trained with adequate teaching aids and resources, they cannot effectively deliver the content.				
4	When lessons are theory-based and lack interactive or practical elements due to poor implementation, students often lose interest.				
5	Inadequate implementation causes disparities between schools.				
B	**How does the insufficient teacher training affect teaching and learning of integrated science curriculum in Ovia North East Local Government Area, Edo State?**				
6	Insufficient teacher training greatly affects the teaching and learning of the Integrated Science curriculum.				
7	When teachers are not adequately trained, they often lack the necessary content knowledge, and practical experience required to effectively deliver science lessons.				
8	Untrained or undertrained teachers may avoid practical work due to a lack of skills in handling laboratory equipment.				

9	Insufficient teacher training leads to the use of outdated or inappropriate teaching strategies.				
10	Insufficient teachers contributes to poor academic performance and weak scientific literacy				
C	**How does poor mastery of integrated pedagogical approaches affect teaching and learning of integrated science curriculum in Ovia North East L.G.A, Edo state?**				
11	Poor mastery of integrated pedagogical approaches has a significant negative impact on the teaching and learning of the Integrated Science curriculum.				
12	Integrated Science requires teachers to use interdisciplinary and learner-centered methods that relate them to real-life situations.				
13	When teachers lack mastery of these pedagogical approaches, they often rely on traditional lecture methods that promote rote learning instead of inquiry-based, exploratory, and problem-solving strategies.				
14	Poor mastery of integrated science makes science lessons less engaging, less practical, and more abstract for students.				
15	Students fail to see the connections between scientific concepts and their daily experiences, which reduces their interest and motivation to learn.				
D	**What are the possible measures that can be taken to minimize the poor teacher training on the implementation of Integrated Science curriculum in Junior secondary school in Ovia North East L.G.A. Edo state?**				
16	Organize periodic in-service training, seminars, and workshops to update teachers on current trends for implementing the Integrated Science curriculum.				
17	Well-equipped laboratories and resource centers make it easier for teachers to conduct hands-on activities and experiments.				
18	Experienced science teachers should mentor newly qualified or less experienced ones.				
19	Educational supervisors and curriculum officers should				

	monitor classroom practices regularly, and support teachers in implementing the curriculum effectively.				
20	Revise and improve teacher education curricula in colleges of education and universities to include more practical and integrated approaches to science teaching.				