IMPACT OF QUALITY ASSURANCE IN THE TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF MINNA, NIGER STATE.

BY

ANNUNE, Jonah Tarlumun

2017/3/69270BE

DEPARTMENT OF SCIENCE EDUCATION
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY MINNA,
NIGER STATE.

AUGUST, 2021

IMPACT OF QUALITY ASSURANCE IN THE TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF MINNA, NIGER STATE.

BY

ANNUNE, Jonah Tarlumun
2017/3/69270BE

A PROJECT SUBMITTED TO THE DEPARTMENT OF SCIENCE EDUCATION, SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA NIGER STATE

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OFBACHELOR OF TECHNOLOGY (B.TECH.) DEGREEIN BIOLOGY EDUCATION

AUGUST, 2021

ABSTRACT

The increasing demand for qualitative Education has given rise to the use of effective quality assurance mechanisms in the teaching and learning of Biology to ensure that products of formal Education meet their expected standards. The research work examines the impact of quality assurance in the teaching and learning of Biology in senior secondary schools in Bosso Local Government Area of Niger State. Considering the importance of quality assurance as a means for enhancing effective teaching and learning of Biology, this research work shed light on the meaning, importance, problems and strategies for establishing quality assurance in the teaching and learning process. The research work covers five (4) randomly selected Senior Secondary Schools in Bosso Local Government area of Niger State. Four research Questions were raised to guide the study. A survey research design was used and the population of the study covers 20 Biology teachers and 100 Biology students making a total of 120 respondents. The research instrument used for the collection of data was questionnaire. 120 Copies of questionnaire with 20 question items were designed. The instrument was designed on a four points Likert types scale such that a respondent selects an opinion against a particular statement. The response categories were as follows: Strongly Agree 4 (SA), Agree 3 (A), Disagree 2 (D), and Strongly Disagree 1 (SD). From the findings of the study, both the teachers and Students were in agreement that the school environment contribute to effective teaching and learning of Biology. Similarly, the teachers and students were also in agreement that the utilization of instructional materials also contribute to effective teaching and learning of Biology. On the basis of laboratory equipment, the teachers and students agreed that there is no enough laboratory equipment for Biology practical in senior secondary schools in Bosso Local Government Area of Niger State. Finally, the teachers and students were also in agreement that the qualification of teachers enhances effective teaching and learning of Biology.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Quality assurance (QA) is seen as a mechanism for ensuring, maintaining and sustaining quality in all areas of education especially that which as to do with the quality of product of formal education. It involves the systematic review of educational provision to maintain and improve its quality, equity and efficiency. It encompasses school self-evaluation, external evaluation (including inspection), the evaluation of teachers and school leaders, and student assessments. As the development of any modern nation is linked to the quality of education provided for it citizenry over time, it is important to note that the vision to greatness is achieved through the provision of a comprehensive quality education (Universal Basic Education Commission (UBE), 2012).

Every society requires adequate human and material resources to improve its social organization, preserve the culture, enhance economic development and reform the political structures. Quality cannot be attained on a platter of gold but must be doggedly pursued, maintained and sustained for the educational goals of any nation to be realized. Over the year, quality assurance mechanisms operated in Nigeria had been narrow in focus without corresponding remediation efforts. The quality of education is the extent to which the learning is considered successful in terms of students achieving a high level of performance within the context of the aims and objectives of education (formal, non-formal special, etc). Such a quality is assured if teaching and learning are effective.

According to Oluruntoyin (2011), Quality assurance practice in Nigerian education is based essentially on school inspection, monitoring and control. While such measures are appropriate for obtaining data on policy implementation and for strategic planning, and aid public accountability, they are of little value when it comes to managing classroom learning processes.

Also, while the provision and rehabilitation of school facilities assist in the delivery of quality, some intervention is needed to plan and utilize such facilities effectively in the teaching/learning process. School inspection has been criticized for its inadequacy to assist classroom teachers to improve their performance. Most children come to school with hope and enthusiasm to learn but somewhere in the process, many fail even though teachers are teaching. Failure therefore, suggests that there is a dissonance between what the teachers teach and the needs of the learners. Inspectors on visits to the school may not be able to handle this problem successfully without the schools' input. Schools are therefore in the best position to address such a problem being in constant touch with their students.

In his view, Hassan (2007), pointed out that quality assurance has to do with the value added to the overall teaching and learning in schools, leading to measurable improvement in the achievement of individual, school and societal goals and objectives. In many countries of the world, there is an inward look at the performance of their educational system because of the critical role education plays in economic and social growth. Many times, it has been seen that progress in terms of growth and global competitiveness is being redressed by the operations and outputs of the educational system and this has been traced to be the quality of teaching and learning in schools.

MacDonald (2011) posited that quality assurance as the set of activities whose purpose is to demonstrate that an entity meets all the quality requirements. He added that this is done by adopting a standard act of process and usually quality assurance techniques like review, training facilitation, etc. Quality assurance is meaningful when the application of its techniques is not deferred till the end of an educational programme. It should be noted that quality delivery begins from policy makers to resource providers, policy implementers and students; that is, it is the responsibility of all stakeholders. Both the input and the processing contribute to the quality of the products. School-based total quality management should put in place as preventive measures against failure and wastage. Efforts would be made to identify learners' needs.

One of the features of much quality assurance in secondary school education relates to examination performance. This assumes that examination performance at a school level, area level or national level gives an indication of quality within the school or schools. This is a massive assumption for which there is no supporting evidence. Indeed, at school levels, the greatest determinant of examination performance seems to be the quality of the intake of the school (Bradley and Taylor, 2003).

Lackney and Picus (2013) observed that an effective school facility is responsive to the changing programs of educational delivery, and at a minimum should provide a physical environment that is comfortable, safe, secure, accessible, well illuminated, well ventilated, and aesthetically pleasing. The school facility consists not only of the physical structure and the variety of building systems, but also includes furnishings, materials and supplies, equipment and information technology, as well as various aspects of the building grounds, namely, athletic fields, playgrounds, as well as areas for outdoor learning.

Sale (2014), in his paper presented at 8th National conference organized by school of education FCE Zaria pointed out that quality is a mechanism used to evaluate the efficiency and appropriateness of teaching and learning in all level of education so as to ensure the delivery of high quality education.

Today in Nigeria, it is observed that some primary school leavers cannot spell nor write their names and that of simple objects correctly and that some secondary school graduates cannot pass prescribed external examinations such as Jamb, Post Utme, etc and that University graduates cannot perform credibly in their field of study when employed. The crux of the matter is that the quality of the product (output) of formal education has a direct relationship to the quality of input into the education system. Very importantly, it should be noted that this input in education includes quality assurance mechanisms put in place in the system to ensure quality.

The impact of quality assurance in the teaching and learning of Biology cannot be overemphasized because Biology as a subject deals with the study of life or living things. The performances of students in Biology as a school subject are mainly determined by the method used. In view of this, anything that can affect the teaching and learning of Biology will invariably affect the development of science and technology in the nation. Teaching and learning of Biology as a subject is also very important in the sense that it is offered as a compulsory subject in senior secondary schools and have some relationship with other science subjects. The study of Biology as a subject encourages the awareness of ones changing environment, explore it better and be better adapted to it.

Biology as a subject is therefore one of the most important science subject for creating self-awareness in the individual for reasonable contribution to national development. The knowledge

of Biology can be achieved through the use of proper teaching method to exploit the potential of the students. Therefore, Biology as a subject develops or provides students with manipulative skills or psychomotor domain. For instance, the skill involved in drawing is well recognized in some aspects of Biology.

Education Quality Assurance involves systematic monitoring, evaluation, regulating and reporting of Educational programmes and practices to ensure that acceptable standards are attained and maintained. It is a dynamic process that provides the needed guidance and support to schools for improved learning out comes for learners. (FEQAS 2016).

1.2 Statement of the Problem

The impact of Quality Assurance in the teaching and learning of Biology cannot be over emphasized. Numerous problems are often encountered during the teaching and learning of Biology. Some of these problems are due to unqualified teachers, poor organization of Biology practical, inadequate teaching aids and lack of laboratory maintenance practices.

Olatunji (2010) stressed out that through the effective use of quality assurance techniques, sound and employable school graduates will be produced. He further stressed that the problem with the educational system in Nigeria is pivotally revolving round lack of quality assurance in the operational base of the school system.

Umezurike (2010) also pointed out that effective use of quality assurance techniques could be hindered when the school manger is showing indifference to information, seminars, conferences, symposia, etc, from where he can get up-to-date knowledge and skills.

It has been observed that employing qualified teachers, organizing effective Biology practical, good laboratory maintenance practices and effective use of instructional materials in the teaching and learning of Biology makes education more interesting and productive because these materials and practices have ways of improving the quality of teaching and learning of Biology.

1.3 Aim and Objectives of the Study

This study was designed to ascertain the impact of quality assurance in the teaching and learning of Biology in senior secondary schools in Bosso Local Government Area of Niger State. Specifically, the study intends to:

1. Determine how the school environment contribute to effective teaching and learning of Biology
2. Determine how the utilization of instructional material contribute to effective teaching and learning of Biology
3. Find out if there is enough laboratory equipment for Biology practical in senior secondary schools
4. Find out if the teachers' qualification enhances effective teaching and learning of Biology

1.4 Research Questions

1. Does the school environment contribute to effective teaching and learning of Biology?

2. Does the utilization of instructional material contribute to effective teaching and learning of Biology?

3. Is there enough laboratory equipment for Biology practical in senior secondary schools?

4. Does the teachers' qualification enhance effective teaching and learning of Biology?

1.5 Significance of the Study

The present study is beneficial to stakeholder in the education sector;

The study will also be of benefit to the society in the sense that it will assist tremendously in improving the quality of education by detecting any barrier or hindrances that might be working against efficiency in senior secondary school. It will also provide data on current performance and help to identify areas of success as well as areas for system and school improvement.

At the regulatory and supervisory level, the empirical findings from this study would serve as framework for policy makers in the Ministry of Education with regards to the place of quality assurance in teaching/leaning of Biology in senior secondary schools with a view to checkmating the emerging poor academic performance in this important school subject.

The outcome of the study will also induce or make the Government to employ qualified Biology Teachers, build well equipped laboratories for carrying out Biology practical as well as providing adequate teaching materials to schools.

Finally, the study will serve as a reference point for other researchers who might be interested in studying quality assurance related phenomena.

1.6 Scope of the Study

The study covers some selected senior secondary schools within Bosso Local Government area of Niger State and the schools are as follows:

i. Day Secondary School Maikunkele 'A'
ii. Model Science College Tudun Fulani
iii. Bosso Secondary School Minna
iv. Maryam Babangida Girls Science College Minna

It is expected that the information required may be adequately obtained within the selected senior secondary schools, which can be a true representation of all the schools in Bosso Local Government area of Niger State.

1.8 Operational Definition of Terms

Biology: is the study of living organisms, divided into many specialized fields that covers their morphology, physiology, anatomy, behaviour, origin and distribution.

Quality: Quality is the ongoing process of building and sustaining relationships by assessing, anticipating, and fulfilling stated and implied needs.

Quality Assurance: This is the systematic monitoring and evaluation of various aspects of a project, service or facility to maximize the probability that minimum standards of quality are being attained by the production process. (Wikipedia, 2012).

Quality assurance also involves systematic monitoring, evaluating, regulating and reporting of educational programmes and practices to ensure that acceptable standards are attained and maintained. It is a dynamic process that provides the needed guidance and support to schools for improved learning out comes for learners. (FEQAS 2016).

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter deals with the review of related literature. This review is presented under the following:

Conceptual Framework**,** Theoretical Framework**,** Empirical Review and Summary of the Literature Reviewed.

2.1 Conceptual Framework

The concept of quality assurance refers to the process of improving the education system by ensuring excellence in teaching/learning/management of the education system with a view to actualizing measurable learning outcomes in literacy, numeracy and essential life skills (UNESCO, 2015). Quality in Education is a multi-dimensional concept and it is often conceptualized differently by different stakeholders including the Government, teachers, administrators, students, and employees (Babalola et al, 2007). Generally, quality implies fitness to purpose in relation to user or customer needs in line with this, the British standards institute (BSI) views quality as the totality of features and characteristics of a product or service that bears on its ability to satisfy stated or implied needs. (Babalola, Adedeji, and Erwat, 2007).

Quality Assurance (QA) is a process centered approach to ensuring that an organization is providing the best possible products or services. Its central focus is on enhancing and improving the process that are used to creating the end product or result, rather than on the result itself or some part of the process such as planning, design, development, production and delivery. In the context of Education, Ciwar (2005) sees quality assurance as involving the setting of standards for the various processes and objectives leading to the production of graduates by training institutions. These processes were noted by Joseph and Agih (2007) to include requirements for entry into educational programmes, programme duration course content, quality of teachers and

their respective qualifications, teaching competence, adequacy and standard of instructional infrastructure and facilities- number and adequacy, the school environment (from a holistic perspective), and examinations (quality of examination items, supervision, moderation of results and grading system). The concept of quality in any educational institution is not easy to define unless in its operational stage.

Adegbesan (2011) describes quality control as a means of establishing quality assurance. Okojie (2013) noticed that most organization use quality control and assurance interchangeably; when quality assurance inspects the process, then quality control takes a lead over the process and the end product. Quality assurance, therefore, refers to deliberate, evidence based strategies and processes of satisfying quality expectations based on the processes, environment and products (Okebukola, 2010, Okojie, 2013).

Quality assurance is often used interchangeably with quality control to refer to ways of ensuring the quality of service. It is a wider concept that covers all policies and systematic activities implemented within a quality system. Quality assurance is a process-driven approach that facilitates and defines goals regarding a particular product. It is a term that is used by all works of life and used in different contexts. It means different things to different groups of people but for the purpose of this paper the word quality assurance would be within the educational context. Centrex (2004) opined that quality assurance is the means by which an organization confirms that conditions are in place for students to achieve the standard set by the training organization. Quality of education is often considered an indefinable construct and at best abstract. An Adegbesan (2011) point out that product in education is different from product in industry since the latter is a definable and tangible item (output) manufactured according to specifications. In

the opinion of Ugwu (2012) he note that quality is essentially about learning what one is doing well and doing it better. It is equally concerned with what one may need to change to make sure one meets the needs of the service user.

Quality assurance is a process of viewing and accessing what pertains to an institution to ensure that the functional aspects of the institutions are maintained. The purpose of quality assurance is to build capacity within an institution for pursuing quality and improvement leading to stakeholders' satisfaction (Manickam & Begun, 2011). To them, this can be achieved through quality assessment involving both internal and external process. It keeps the institutions abreast of the needs and demands of individual and groups. It is a continuous process aiming at excellence. This could come in form of self-analysis and assessment internally within an institution of learning be it primary, secondary and tertiary levels respectively. Fadokun (2005) sees quality assurance in education as a programmed, an institution or a whole education system. In such a case, quality assurance is all these attitudes, objectives, actions and procedures that through their existence and use, and together with quality control activities, ensure that appropriate academic standards are being maintained and enhanced in and by each programme. A more holistic perspective of education quality is that offered by Maduewesi (2005) who sees educational quality as summarizing learning content, how learning is organized and managed, what goes on in the learning environment and the outcome of learning. Furthermore, Ciwar (2005) believes an index of quality is the admission policy and that other indices include supervision, quality of teachers and facilities, course content and quality of exam items also indicate quality. Quality assurance is a total, holistic term, which is directed toward education as an entity, concerned with ensuring the integrity of outcomes. It entails the supplier and consumer and the various activities put in place to produce quality products and services (Mkpandiok,

2007). The general meaning of quality assurance is very applicable to the production of functional teachers. It is the management of goods, services and activities from the input stage, through processes, to the output stage of production (Onocha, 2002).

Ajayi and Adegbesan (2007) argue that, quality assurance is related to accountability both of which are concerned with maximizing the effectiveness and efficiency of educational systems and services in relation to their contexts, of their missions and their stated objectives. In his own definitions, Ehindero (2004) says quality assurance focused on the Learner's entry behaviour, characteristics and attributes including some demographic factors that can inhibit or facilitate their learning, the teacher entry qualification, values pedagogic stalls, professional preparedness, subject background, philosophical orientation, the teaching/learning processes including the structure of the curriculum and learning the outcomes, which are defined for different levels in terms of knowledge, skills and attitudes including appropriate and relevant instruments to assess these objectives. In his own definitions, Ehindero (2004) says quality assurance focused on the Learner's entry behaviour, characteristics and attributes including some demographic factors that can inhibit or facilitate their learning, the teacher entry qualification, values pedagogic stalls, professional preparedness, subject background, philosophical orientation, the teaching/learning processes including the structure of the curriculum and learning environment, the outcomes, which are defined for different levels in terms of knowledge, skills and attitudes including appropriate and relevant instruments to assess these objectives.

Quality assurance aims at preventing quality problems and ensuring that only conforming products reach the customer. The characteristics of an effective quality assurance mechanism are periodic audit of the operation of the system; periodic review of the system to ensure it meets

changing requirements. Quality assurance recognizes the autonomy of organizations and seeks to enhance their capacity to operate in a responsive way. Three approaches to the definition of quality would be used and these are the reputational approach, the outcomes approach and the total quality approach. The reputational approach sees quality as exceptional and it is seen as exclusive. It is something that some have at the exclusion of others. It is distinctive and intuitive recognizable. This approach regards quality as excellence, it is a standard attained in our education sector; the outcomes approach regards quality as efficient production, there are no absolute standards but specifications, the quality of a product is measured by the extent to which it meets customer's specifications. This approach is more related to practices in industry while the total quality approach is seen as value added to the abilities of students who have passed through the system regardless of their ability levels. These are different views of quality however, one can accept quality with regard to the output of teacher education as the level of excellence in performance on the strength of the quality of the context, inputs, process transaction and output (Onocha, 2002).

This shows that to attain or assure quality in output, a lot quality inputs and processes would have been made. Quality in output does not come by chance. It requires carefully planned and deliberate efforts. Quality assurance, in its broad sense, is any action taken to prevent quality problems from occurring. In practice, this means devising systems for carrying out tasks which directly affect product quality. A simple example of quality assurance is a well prepared lesson plan. A lesson plan is a detailed description of the course of instruction for a particular class. A daily lesson plan developed by a teacher to guide class activity or instruction and it is drawn from the scheme of work. It describes all that are necessary to deliver the lesson, the entry behavior, specific behavioural objectives, instructional materials, references, steps taken to teach.

Adequate lesson preparation produces better and more consistent results. Education Quality Assurance in Nigeria is a paradigm shift from the former practice of school inspection to a monitoring and evaluating process that provides a new operative mode of evaluation. These innovations in inspection activities go under terminologies as: whole school evaluation, school self-evaluation or self-review. All aim at producing a good school or an effective school. What then is a good school? It is a school which knows what its standard should be, asks itself whether it has attained them, and if not where it has reached on the scale and what it should do to close the gap. It is a school whose head has a well-articulated plan of what the school should be doing and who also motivates the pupils, staff, parents, the community and the proprietor to join hands in reaching the goals. In fact, this kind of collaboration should be the driving force of the innovation.

2.1.1 Importance of Quality Assurance in Education

The importance of quality assurance in the teaching and learning of Biology cannot be overemphasized. In order to ensure quality in teaching and learning, Adebesan (2011) in his research paper stresses the need for quality assurance in Nigerian Education System as follows:

i. To determine the level of adequacy of the facilities available for quality control.
ii. To ensure and maintain high standard of Education at all levels.
iii. To determine the number of classrooms needed based on the average class size to ensure quality control in Education.
iv. To serve as indispensable component of quality control strategy in Education.
v. To assist in monitoring and supervision of Education.
vi. To determine the quality of teacher input.
vii. It would ensure how the financial resource available could be prudently and judiciously utilized.

2.1.2 Strategies for Establishing Quality Assurance in Education

Quality assurance is important to school success in terms of its mission, goal and objectives. It is, therefore, imperative that school leadership put in place mechanisms to ensure that quality assurance practices are being followed in their schools with a sole aim of improving education quality and standards (Ajuoga, Indoshi & Agak, 2010). The strategies used for quality assurance in Education include:

(a) **Monitoring:** it refers to the process of collecting data at intervals about ongoing projects or programmed within the school system. The aim is to constantly assess the levels of performance with a view of finding out how far a set objectives are being met (Ehindero, 2001).

(b) **Evaluation:** This is a formal process carried out within a school setting. It is based on available data which are used to form conclusions. It could be formative or summative. The aim of evaluation as a quality assurance strategy, is to see how the system can be assisted to improve on the present level of performance (formative) (jaiya, 2001).

(c) **Supervision:** Supervision might involve inspection, but it goes beyond inspection and includes attempt at bringing about improvement in the quality of instruction. It involves staff as essential part of the process. It is a way of advising, guiding, refreshing, encouraging and stimulating staff (Onocha, 2002). Kimeu (2010) observed that supervisory methods used by head teachers were inadequate since they were limited to checking of teachers' records of work rather than training in supervisory methods in order to improve productivity.

(d) **Inspection**: it usually involves an assessment of available facilities and resources in an institution with a view to establishing how far a particular institution has met prescribed standards, it is more of an assessment rather than an improvement induced exercise.

(e) **Quality Control:** The issue of quality control cannot be overemphasized. It is one of the strategies for establishing quality assurance in the inferior Education system at all levels. Ojedcle (2007) viewed that quality control should be of concerns to the country in its drive towards technological development. For this to be successfully carried out, there is need to examine the qualification of teachers, ensuring gender equality, adequacy of the curriculum, availability of equipment in the required number as well as the proper use of the processes involved in the various skills to ensure that the finished products are of high standard.

(f) **Access and Equity:** Ojedele (2007) asserts that the trend of students transiting from the junior secondary school to other level of Education has not been encouraging as it has been falling short of the expectation. He argued further that the issue at the tertiary level presents a situation that calls for concerns in terms of variation in access to universities, polytechnics and Colleges of Education and in terms of gender disparity. Many stakeholders in higher education see quality as ambiguous and elusive and thereby making it difficult for researchers to agree at a common understanding. This is essentially so in higher education as compared to industries where clearly definable products with quantifiable qualities exist.

2.1.3 Functions of the Quality Assurance Unit

U.B.E (2017) highlights the functions of quality assurance and control unit in education to include:

(a) Develop, apply and periodically review the quality benchmarks/parameters for various academic and administrative activities of the institution:

(b) Facilitate the creation of a learner- centered environment conductive to quality education and academic staff professional growth.

(c) Provide feedback mechanisms for students, parents and, other stakeholders on quality-related issues.

(d) Disseminate information on various quality parameters of teacher education.

(e) Organize inter and intra institutional workshop, seminars on quality related themes.

(f) Document various programs/activities leading to quality improvement.

(g) Act as the model unit of the institution for coordinating quality-related activities, including adoption and dissemination of best practices.

(h) Work closely with academic department and the institution's Management Information Systems (MIS) for the purpose of management/enhancing the institutional quality.

(i) Promote and help sustain the culture of quality on the institution.

(j) Lead the internal self-assessment process and prepare and submit the report to U.B.E board annually.

(k) Coordinate Logistics during external accreditation/assessment.

Giving the operational definition of quality assurance, Awoyemi (2006) emphasize that in the individual university level, the most common assurance measures are course or programme accreditation, external examiners and teaching appraisal programme. Accreditation is a mechanism for ensuring that planning and facilities for new courses are adequate. By this concept, quality assurance is a process and systems put in place to ensure that a product is measured up to laid - down specifications and standard. On the basic principles underlying quality assurance, Manford (2006) opined management commitment, Customer focus

satisfaction, employee empowerment, continuous improvement, organization culture arid attitude, team work, education and training, communication and measurement.

Okebukola, (2010) noted that quality assurance is an umbrella concept for a host of activities that are designed to improve the quality of inputs, process and outputs of higher Education system. In line with this, Ajodele (2007) contend that quality assurance entails the quality of available instructional materials for teaching, equipment, facilities, school environment, pupils, curriculum, quality of instructional delivery and quality of teachers. Quality assurance is designed to prove and improve the quality of an institution, methods, educational products and outcomes (Ojebode et al, 2008). Everyone has a role to play in ensuring quality assurance in Education. One of the key building blocks of quality assurance in Education is the development of minimum standard as in qualification of teachers, the quality of teaching in institutions, expected Educational achievements of students and the development of a more rigorous management process for Education so that the entire sector develops stronger operating policies and procedures which are well documented and adhered to. With time, this will develop into a total management system for higher education in line with what is practiced internationally. Ajayi and Adegbesan (2007) argue that quality assurance is related to accountability both of which are concerned with maximizing the effectives and efficiency of Educational system service in relation to their contexts of their missions and their stated objectives. In his view, Ehindero (2004) says quality assurance focuses on:

(i) Learners' entry behaviours, characteristics and attributes including some demographic factors that can inhibit or facilitate their learning.

(ii) The teacher entry qualification, values, pedagogic skills, professional preparedness, subject background, philosophical orientation e.t.c.

(iii) The teaching and learning process including the structure of the curriculum and learning environment.

(iv) The outcomes, which are defined for different levels in terms of knowledge, skills and attitudes including appropriate and relevant instruments to assess these objectives.

Ramson-Yusuf (2005), opined that quality assurance is the process of maintaining standards in products and services through inspection or testing of samples. Jaiyeoba and Atanda (2003) posted that quality is synonymous with standard, efficiency, excellence, relevance and worthiness. When applied to education, it is the success with which an institution provides educational environment which enables students to effectively achieve worthwhile learning goals including appropriate academic standard.

Babalola (2004) sees quality assurance in Education as a proactive means of ensuring quality or inputs, teaching-learning process, academic achievement of pupils and school environment before things get out of hand. In the same vein, Materu (2007), stated that quality assurance is a planned and systematic review process of an institution or programme to determine whether or not acceptable standards of education, scholarship and infrastructure are being met, maintained and enhanced. Ojerinde (2008) described quality assurance as the degree of conformity of procedures of an organization with set standards. Arikewugo (2004) viewed quality in education to be judged by both its ability to enable the students perform well in standard examinations and

relevant to the needs of the students, community and the society as a whole. He finally posited that quality serves as determination of graduations based on standard of excellence.

2.1.4 Problems of Quality Assurance in Education

There are numerous factors militating quality assurance in the teaching and learning of Biology. These problems have led to falling standards which is reflected in the lack of political will, increased dropout rate, high degree of illiteracy and the general decline in competence among tertiary Education graduates. Some of these problems include:

(i) **Inadequate facilities and equipmen**t: Quality higher education is dependent on the quality and quantity of human and material resources put in place in institutions of higher learning. Inadequate teaching and learning facilities and equipment at all levels in terms of quality and quantity. They are either in short supply or not available. The quality assurance instruments for ensuring their adequacy are either inadequate or not appropriately supplied. Udeanna (2004), reported that infrastructural facilities in terms of classroom, buildings, furniture, libraries, laboratories, water electricity, toilet facilities are lacking in public schools. Under this kind of situation, what is expected is poor quality.

(ii) **Inadequate and poor quality of teaching staff**: A big challenge to the attainment of quality Education is the lack of academic staff. Ajayi (2007) seems to concur with the above when he noted that good teachers are needed for good education which in turn is indispensable for social change, social transformation and national development.

(iii) **Poor funding**: This factor is very important because it affects every facet of the education system. The effective implementation of the curriculum which is hinged on adequacy of

manpower, facilities, quality assurance implementation, is directly dependent on adequate funding. Poor funding of education has been a matter of concern and has its toll on the quality of products of formal education. Many institutions of higher learning in Nigeria were unable to build lecture halls, students' hostels, equipped laboratories, workshops, payment of staff salaries, research grants, allowances and medical bills. Funding of the basic level of education can be said to be neglected by the government at the Federal, State and Local levels because the National Policy on Education states that financing basic education should be the collective responsibility of these various tiers of Government. An analysis of the Federal government's annual budget allocation to education revealed that the government is in the habit of allocating low amounts of money to the educational sector.

Habibu (2011) observe that inadequate funding is one of the greatest obstacles of quality primary education in Nigeria because the annual budget is far below 26% prescribed by UNESCO either by Federal or State government. This is very evident in the year 2009 in which the percentage budgetary allocation to education was set at 7.25%, it decreased to 4% in the year 2010. It then increased to 6% in 2011 and then increased further to 8.20% in 2012. It rose considerably to 8.55% in 2013; it increased tremendously to 9.94% in 2014. It decreased drastically between 2015 and 2016. This is because 7.74% and 6.10% of the annual budget allocation was given to education sector in 2015 and 2017 respectively. The budgetary allocation Increased in 2017 to 7.38% and decreased to 7.03% in 2018.

(iv) **Poor monitoring, inspection and supervision**: The poor monitoring and supervision by regulatory bodies that ensures quality through implementation of various quality assurance strategies has been part of the cause of poor quality of products of formal education. Agents of

quality control and assurance include the National Council on Education (NCE) at the political and administrative level, special commission like National University Commission (NUC) Nation Commission for Colleges of Education (NCCE), National Board of Technical Education (NBTE), National Commission for Nomadic Education (NCNE). Examination bodies like West Africa Examination Council (WAEC), National Examination Council (NECO), Unified Tertiary Matriculation Examination (UTME), the inspectorate and institution quality control and assurance strategies and structure.

2.1.5 The Role of Quality Assurance in Primary Education

Quality assurance is an umbrella concept for a host of activities that are designed to improve the quality of the primary education system. It embraces all the functions of the school including such activities as teaching, caring, staffing, pupils, building, facilities and child development. Concern for quality assurance in primary education is most desirable for the fact that it serves as foundation for all other levels of education for if the foundation is destroyed what can the builders do? Adegbesan (2011) highlights the following as the major need for quality assurance in Nigeria's educational system, such as:

(i) To fill in as fundamental part of value control methodology in training

(ii) To guarantee and keep up exclusive requirement of instruction at all levels

(iii) To help with checking and supervision of training

(iv) To decide the nature of the educator contribution.

(v) To decide the quantity of study halls required dependent on the normal class size.

(vi) To guarantee quality control of instruction.

(vi) To decide the degree of ampleness of the offices accessible for quality control.

(vii) To guarantee how the money related assets accessible can be wisely and reasonably used.

Ijaya (2010) opined that an educational system's worthiness lies in its capability to continuously serve its customers, (pupils/students, parents, employers, the society) better and remain relevant. While quantity in primary education is concerned with getting as many children of school age to school in large number within the shortest time allowed, quality answers the question: What manner of education? How good or bad are the products? The utility value of quality assurance can be seen through the provision of information to the public and other interested parties about the worth of the primary education delivery system. It equally ensures accountability in respect of the investment of public funds (Okebukola et al, 2007). Quality assurance is about ensuring that the school is performing the best that it can. It is not about compliance with regulations or counting textbooks but about the quality of the work of a school and its impact on pupils.

Olagboye (2007) noted that quality is the arrangement made or the mechanism put in place to maintain the degree of excellence of a product or service applied to education. It means the mechanisms by which an education system ensures that the service it delivers or intends to deliver serves the purpose for which it is intended. It focuses on the means by which an education system ensures that the service it provides remains relevant and appropriate to the needs of the society The issue of quality assurance in Nigeria education system is a common agenda for all tertiary institutions in the country (Ehindero. 2004). Quality control measures in the system are often viewed as hot test of credibility and value. Tertiary institutions in Nigeria

usually take the exercise serious and with commitment whenever it calls. Usually the exercise is being carried out under the auspices of the regulatory bodies for the various arms of tertiary institutions in Nigeria, the quality assurance regulations is often referred to as Benchmark minimum academic standard while the quality assurance exercise or evaluation is most often referred to as accreditation. Thus, accreditation exercise for academic programmes/departments in tertiary institutions is aimed at evaluating programme/departmental curriculum offering. The accreditation exercise focuses on general and specific objects, its staff strength, quality of students, equipment and facilities including general administration and execution of the programme.

Okebukola (2010) proposed a system approach to quality assurance. This demands that dimensions of input, process and output should be the focus. The input segment includes pupils, teachers, curriculum and facilities. On the process side, emphasis is on teaching/learning interactions, internal efficiency, evaluation procedure and management practices. The output includes the quality of primary school leavers as well as the system's external efficiency.

2.1.6 Impediments to Quality Assurance in Nigerian Primary Education System

Depressed funding, capacity deficit in governance and management, political interference and corruption are some of the major impediments to quality assurance in the Nigerian primary education system.

(i) **Poor funding:** Explains infrastructural deficiencies and the engagement of head teachers in unwholesome income generating activities such as illegal levies and spending work time on other businesses. Strikes and closures necessitated by delayed and poor salaries are also

connected directly or indirectly with poor funding. Political interference stands as obstacle to the quality assurance process in the appointment of weak but politically connected head teachers.

(ii) **Over-crowded classrooms:** It hardly provides opportunity for learning. Research has shown that teachers are frustrated by the large number of pupils in the classes, sometimes about 100-150 pupils are crowded in a classroom with only one teacher and even where there are two or more teachers the pervading noise renders the class uncontrollable (Onukaogu, 2001 and Okebukola, 2012).

(iii) **Low socio-economic status of public school pupil's parents:** This poses a huge challenge to quality assurance. Many of the children go to school on empty stomach and are ravaged by different kinds of diseases. Many of such pupils sleep during classes and absenteeism is common feature (Okebukola, 2012, Onukaogu, 2001 and Punch, 2011). Children's capacity for learning is largely determined by their health and nutritional states. There is ample evidence that pre-school nutritional and stimulus deprivations are associated with deficits in cognitive development. Many children in the public schools are malnourished and have little exposure to learning materials before entering school (Okebukola, 2012). In a survey of literacy practices, perceptions and teachers' competencies, there were notable differences in the learning resources provided in public schools. There was evidence that public primary schools lacked the required textbooks, libraries and other learning resources (Okebukola, 2012).

2.1.7 The Future of Quality Assurance in Nigerian Primary Education System

The ingredients for success for improved assurance are building up. The Federal Ministry of Education through its education roadmap to 2020 is repositioning quality assurance through the intervention of the Education Section Support Programme in Nigeria (SSPIN). This is a step in the right direction. Currently, those working in schools are reluctant to take responsibility for education quality because of the lack of resource and other challenges earlier highlighted. A more lasting goal as identified in the Federal Minister of Education's Roadmap is the establishment of the National Agency for Education Quality Assurance (NAEQA) ESSPIN will support the development of NAEQA as a means of coordinating and driving policy and processes of quality assurance at Federal and State levels. Education Sector Support Programme in Nigeria (ESSPIN, 2012).

This is supposed to subsume all the varied types of current inspection and inspectors towards the style activity of quality assurance inspection linked to school self-evaluation. As noted in the Education Sector Support Programme in Nigeria (ESSPIN) position paper, school inspection in Nigeria has over time became increasingly ineffective and irrelevant to the process of improving education. The body is therefore poised to support the political and popular desire to offer Nigerian children a productive and useful education. The focus is therefore to reform inspection to concentrate on quality other than just compliance to laws, rules and procedures. No doubt the proposal looks good on paper but whether or not these efforts will be well coordinated, implemented and sustained is a matter for debate judging by the way of earlier policies. We however look to the future with hope trusting in the legendary Nigerian survival spirit. The initiative and trust should be backed up with political will without which no laudable project will

see the light of day in Nigeria. It is conjectured that the challenge to quality will continue to be on the horizon in the coming years. The pressure of enrolment will increase with the Universal Basic Education policy and its attendant quality challenges. The following suggestions are made to ensure that quality assurance of primary education is sustained and improved upon:

(i) **Ensuring a Synergy of the Quality Assurance Agencies:** The current quality assurance agencies for primary education function independently of others with no operational link. Therefore, for the purpose of collaborative efforts, such bodies as Universal Basic Education Commission (UBEC), Teachers Registration Council (TRC), National Primary Education Commission (NEC) should partner with the Education Sector Support Programme in Nigeria (ESSPIN) to ensure proper alignment and focus to avoid duplication of duties and reduce wastage rate.

(ii) **Improved Funding of the System:** Human and financial resource strengthening of the regulatory agencies through the Education Trust Fund (ETF) monitoring the disbursement and use of such funds will foster functionality. Capacity building through local and overseas training of all professional staff of the agencies should be accorded priority attention.

(iii) **Resuscitation of Primary/Basic School Leaving Certificate Examinations:** Since one of the objectives of primary education is advancement to higher learning, the primary school leaving certificate examination should be resuscitated. Secondary schools deserve the right to know the entry behaviour of their new intakes in order to plan appropriate instruction and follow-up on their performance.

(iv) **Establishment of State Quality Assurance Agencies:** State Governments should model the example of Lagos State in setting up agencies that will take responsibility for quality like School Improvement Scheme under the auspices of State Universal Basic Education (SUBEB).

(v) **Effective Use of ICT in Quality Assurance:** The efficiency and impact of the quality assurance process will be significantly enhanced with increased use of Technology (Okebukola, 2012). Quality assurance practitioners will need to be continually updated about emerging technologies so that they can be deployed for data capture, processing and management of the quality assurance process.

(vi) **Participation of Non-Governmental Organizations:** The deep need for improved quality primary education in Nigeria and the substantial costs involved point to the need for the participation of nongovernmental organizations like the GFR and Parents-Teachers Association (PTA) (Data on Primary School Funding).

To effectively support primary education, donor agencies will need to provide broad support for specific needs, priorities and project investments. However, effective donor assistance will depend not only on the degree to which the aid is increased but also on the extent to which it is coordinated, monitored and used. For optimal efficiency, aid programmes must be mutually supportive and reinforcing and focused upon improving the policy and institutional framework for educational development.

(vii) **International Partnerships:** Partnership with international institutions and agencies with sound quality assurance can help in complementing the local efforts and in training practitioners. Financial aids can also be sought from developed countries in supplementing finances.

2.1.8 The role of Science Laboratories

Laboratory facilities are the material resources that facilitate effective teaching and learning in school laboratories. (Jaiyeoba and Atanda, 2005; Timilehin; 2010) posited that laboratory facilities are those things which enable a skillful science teacher to achieve a level of instructional effectiveness that far exceed what is possible when they are not provided. The science Laboratories includes biology, Chemistry, mathematics, physics and integrated science (Okeke. 2015. This refers to the specific strategies or measures undertaken by monitoring bodies of tertiary institutions in Nigeria to meet the minimum standard of these Laboratories expectations (Okeke. 2015) It can also be viewed as the processes developed and adopted by monitoring tertiary institutions in Nigeria to ensure that quality delivery in the system are maintained and adhered to.

Nzewi and Nwosu (2010) were of the view that laboratory resources can therefore be said to be supplies of teachers, learners, laboratory assistants/technologists, instructional materials and other necessary devices made available to the school in order to increase the wealth of knowledge, which gives help, support in the teaching and the learning process in secondary schools. Dangbin (2008) also reported that practical activities using sufficient facilities enable learners to acquire cognitive skills such as formulation of hypothesis, making assumptions, designing investigations, understanding variables, observing, recording date etc and associated with these activities are scientific attitudes like curiosity, perseverance etc which are necessary for engaging in faithful science investigation.

Udonfu (2009) and Omiko (2015) observed that the use of the laboratory in science teaching has the following benefits:

(i) Laboratory teaching makes the students/learners to learn about the nature of science and technology in order to foster the knowledge of human enterprise of science and thus enhance the aesthetic and intellectual understanding of the child.

(ii) Learning scientific inquiry skills that can be transferred to other spheres of problem solving (that is acquisition of problem solving skills).

(iii) Students learning to appreciate and emulate the role of the scientist through acquisition of manipulative skills. The students should be allowed to investigate by:

(a) Indirect observation of objects and materials for the acquisition of mental as well as manipulative skills, example measuring substances, using weighing balances pictures, cylinder, etc.

(b) Through multiple trials, students can in the process of fiddling with materials and activities without stated theories arrive at useful conclusions.

(c) Given a known theory, students can be guided to observe some phenomena selected by the teacher and from such observation make predictions that are likely to occur.

(iv) Developing interests, attitudes and values by considering what science entails, it is clear that a field experience has the best potential for stimulating a life time interest in science in the students when accorded the chance for personal experience by handling the real things. Students interest in science increases as they yearn to investigate and explore more about their environment. In spite of all the advantages and the recognition given to science subjects as the pivot for technological and economic development of a nation, the laboratory learning environment in which the science subjects supposed to be learnt seems not to be conductive for

effective teaching and learning process. This has led to the perception of students that science is a difficult subject. This perception of students has affected learners' interest and led to declining rate of students' achievement in science subjects in Senior Secondary School Certificate Examinations (SSSCE) conducted by West African Examinations Council (WAEC) and National Examinations Council (NECO) in Nigeria (Akinbobola, 2011).

Lyons (2012), states that learning is a complex activity that involves interplay of students" motivation, physical facilities, teaching resources, skills of teaching and curriculum demands. The process of managing and organizing resources is called resource utilization. The utilization of resources (laboratory facilities) in education brings about fruitful learning outcomes since resources stimulate students learning as well as motivating them.

Omiko (2015) and Ufondu (2009) were of the same opinion where they observed that laboratory teaching is sometimes used in conjunction with large lecture courses so that students may acquire technical skills and apply concepts and theories presented in the lecture. Omiko (2015) stated that hands-on experience encourages students to develop a spirit of inquiry and allows them to acquire scientific skills and the right attitude to handle scientific tools and materials. Science laboratory provides students with the richest experiences which they will transfer to the society and their various places of work. It helps in providing the students the opportunities to practice science as the scientist do. In order for the laboratory to be effective, students need to understand not only how to do the experiment, but why the experiment is worth doing, and what purpose it serves for better understanding of a concept, relation, or process.

2.2 Theoretical Framework

In this chapter, the theories relating to quality assurance are discussed.

2.2.1 Theory of Value-added in Internal Education Quality

According to (Cheng, 2001), the internal quality assurance is based on the theory of value-added in education quality, assuming that the larger the improvement of internal process of teaching and learning, the larger the value-added to education quality. As shown, if the internal process including different components and their relationships can be improved during a time period T1 to T2, the area of value added in quality will increase as the achievement of the planned goals is increased. The larger increase in achievement of planned goals is due to the larger improvement of internal process. Therefore, based on this theory, the component quality approach, the relationship quality or the total internal quality approach can add value in quality if it can improve some or all aspects of the internal process of education.

There are eight models of education quality that can be used to understand and manage quality of education from a perspective taking educational institution and its interface with environment into consideration. The first three models, including the goal and specification model, the process model and the absence of problem model, are concerned with the internal quality assurance focusing on internal goal achievement, process improvement, and internal problem avoidance. These models can be used to manage and ensure internal quality in education. (Cheng, 2001)

The Goal and Specification Model: The goal and specification model assumes that there are clear, enduring, normative and well accepted goals and specifications as indicators and standards for education institutions or education systems to pursue or conform. Education quality defined

by this model is the achievement of the stated goals or conformance to the specifications listed in the institutional plan or program plans. It is a type of internal quality. Quality assurance by this model is to ensuring achievement of stated goals and conformance to given specifications. The typical examples of quality indicators to be used may include students' standard units and performance criteria achieved, guided learning hours attained, standardizations achieved and personal developments, staffs' professional qualifications, etc.

The Process Model: The model assumes that nature and quality of institution process often determine the quality of output and the degree to which the planned goals can be achieved. Particularly in education, experience in process is often taken as a form of educational aims and outcomes. Therefore, education quality defined by this model is mainly the smoothness and health of internal processes and the fruitfulness of learning processes. The process in an education institution generally includes management process, teaching/training process, and learning process. Thus the selection of indicators may be based on these processes, classified as management quality indicators (e.g. leadership, decision-making), teaching quality indicators (e.g. teaching efficacy, teaching methods, assessment method), and learning quality indicators (e.g. learning attitudes, guided learning hours). Quality assurance by this model is to ensure smooth healthy internal process and fruitful learning experiences. It is also a type of internal quality assurance with emphasis on internal improvement.

The Absence of Problems Model: The model assumes that if there is absence of problems, troubles, defects, weaknesses, difficulties, and dysfunctions in an education institution, this institution is of high education quality. Therefore, education quality is defined as the absence of problems and troubles inside the education institution. Quality assurance relies heavily on

institutional monitoring and reporting to ensure no problems and deficiencies arising from its operation and structure. This is perhaps the oldest concept of internal quality assurance in use in industry. Quality control experts tend to look at quality as less scrap, rework, warranty costs, etc., of the final product. The management team of an education institution may set up stringent quality assurance and monitoring system in order to ensure a deficiency free environment. Identifying strategies for internal improvement of an education institution can be more precisely done by analyzing problems and defects as opposed to education quality. Therefore, this model is useful particularly when the criteria of education quality are really unclear but the strategies for internal improvement are needed. External quality assurance ascertains this in skills acquisition training, like National skills qualifications.

2.3 Empirical Studies

Okereke. (2014) carried out a study on the Strategies for Ensuring Quality in the Business Education Programme of Tertiary Institutions in Anambra State. The survey method was employed. One research question guided the study while two null hypotheses were tested at 0,05 degree of significance. A structured questionnaire was used to gather data for the study. The study population comprised 71 business teachers in tertiary institutions in Anambra State. Data collected was analyzed using Mean statistics while the null hypotheses were analyzed using ANOVA. Based on the findings of the study, it was concluded that the adoption of strategies such as quality of syllabus and provision of requisite infrastructure and facilities to the business education programme will ensure qualitative education.

Thomas (2014) carried out a research on Perceptions of Lecturers on Quality Assurance in Higher Education Teaching and Learning Process in South Africa on their perspective on quality

assurance in teaching and learning. As the study was qualitative in nature interview was used as the main instrument for data collection. The results of the study showed that perception on quality assurance according to the respondents is influenced by several factors including lecturers' income levels. Academic qualification and teaching experience job satisfaction career achievement. Students' learning needs. Students' knowledge and experience The significance of the study was the realization that the perception regarding concept of quality assurance is difficult to define and articulate as the quality of a product or service is concerned with the attributes and characteristics which suppliers and customers expect at the time of production and purchase, as well as during the life of the product or service.

Okeke (2015) carried out a study on the Strategies for ensuring Quality standard in Degree Chemistry Education Programme in Enugu state college of Technical (ESCET) The design of the study is survey method. One research question and two null hypotheses guided the study. The two null hypotheses were tested at 0.05 level of significance. A structured questionnaire was used to gather data for the study. The study population comprised all Chemistry students of year one to veer three students of 2011/2012. 2012/2013 and 2013/2014 sessions and their lecturers numbering three hundred and sixty (360) persons. The sample and sampling technique are one hundred (100) students and random sampling technique. The instrument used is structured questionnaire. The data collected were analyzed using Mean (x) statistics while the null hypotheses were analyzed using t-test analysis. Results shows that the mean and standard deviation (SD) obtained are 112.34 and 34.09 while the t-test analysis obtained the t-Cal= 51.06 and hence t-critical was found as 1.68. These indicate that the Hypotheses are significant. From the findings of the study it was concluded that the adoption of strategies such as quality of syllabus and provision of requisite infrastructure and facilities like standard Chemistry laboratory

and chemistry library for Degree Chemistry Education did the magic. Provision of Chemistry library and quality lecturers in their correct ratios of degrees as stipulated by National university commission (NUC) and a good number of quality students ensured qualitative education that earned the chemistry full accreditation.

Summary of the Literature Reviewed

Several deductions can be drawn from the literature review these include:

i. There is no one definition for quality. Quality can be defined in various ways and its definition is influenced by the person who is providing the definition and his/her position in relation to the education system.

ii. Conceptions of quality have implications for how quality is assessed. Concepts determine the focus of assessment and the methods used for evaluation.

iii. There are many options to consider when choosing a quality assurance system. These include, but are not limited to, the purpose of quality assurance (e.g. quality control, accountability, or improvement), the affiliation of the quality assurance agency (e.g. government controlled versus autonomous), the approach used (e.g. audit, assessment, or accreditation and voluntary versus compulsory), and relationship to public funding (e.g. direct funding or incentives).

iv. Existing quality assurance models continue to evolve in response to criticisms from external stakeholders for greater transparency and increased attention to learning outcomes. A single model is unlikely to address the needs and expectations of all stakeholders.

v. External quality assurance is linked to internal quality assurance. It is possible for institutions to comply with accountability requirements without making significant improvements in quality;

however, establishing academic structures and implementing procedures that encourage institutional learning and a culture of evaluation is important for quality improvement.

vi. Aspects of institutional culture can influence the implementation of quality assurance. For example, organizational leaders' attitudes, responses and support can greatly influence the failure or success of quality initiatives.

vii. Institutions in developing countries face considerable constraints in adopting the quality assurance schemes used in developed countries. There is need to pay attention to the national conditions, cultural attributes and institutional and systemic contexts and to modify the design, expectations and requirements of such systems as appropriate.

CHAPTER THREE

3.0. RESEARCH METHODOLOGY

3.1 Introduction

For any research project to be accurately carried out, its concept and overview must also exist in the mind of the researcher. This chapter describes the nature of the research design, population of the study, sample and sampling procedures. Others include instruments for data collection, description of instrument, validation and reliability of instrument, administration of instruments, method of data collection and method of data analysis.

3.2 Research Design

The research design for the study is basically the survey method. The survey method enables information to be obtained from representative sample of the population and describe the situation as they exist. Data collection is limited to students and teachers among the selected secondary schools in Bosso Local Government Area of Niger State. The research work helps to ascertain the impact of quality assurance in teaching and learning of Biology in senior secondary schools in Bosso local government area of Niger State. The researcher adopted the questionnaire method to carry out the research work. The researcher prepared questionnaire which were in two forms, one for the students and the other for the teachers.

3.3 Population of the Study

The population of the study covers twenty-five (25) Biology students from each of the selected senior secondary schools and five (5) senior secondary school teachers also from each of the selected schools, making a total of 120 respondents as constituting the population for the study.

3.4 Sample and Sampling Technique

To ascertain the impact of quality assurance in teaching and learning of Biology in senior secondary schools in Bosso local government area of Niger state, the sample for the study were randomly selected to reflect the true opinion of both the teachers and students. The sample covers four senior secondary schools within Bosso Local Government area of Niger State and the schools are as follows:

Table 3.1 Breakdown of Selected Sample by Schools

S/N	Name of School	Type of School	Number of Teachers	Number of Students
1	Day Secondary School Maikunkele 'A'	Mixed	5	25
2	Model Science College Tudun Fulani	Male	5	25
3	Bosso Secondary School Minna	Mixed	5	25
4	Maryam Babangida Girls Science College Minna	Female	5	25
	Total		**20**	**100**
	Grand Total			**120**

3.5 Research Instrument

The research instrument used for the collection of data was questionnaire. The research questions in chapter one of the study constitute the basic foundation for the construction of the questionnaire.

120 Copies of questionnaire with 20 question items were designed by the researcher which was administered to the students and the teachers in order to obtain necessary information needed for the research study. However, the scope of the content contained in the questionnaire as well as its relevance was examined and validated by experts (Lecturers) in order to ascertain their reliability and sustainability.

The instrument was designed on four points Likert types scale such that a respondent selects an opinion against a particular statement. The response categories were as follows: Strongly Agree 4 (SA), Agree 3 (A), Disagree 2 (D), and Strongly Disagree 1 (SD).

3.5.1 Description of Instrument

The instrument employed for the research work was questionnaire. The questionnaires were carefully drawn and tagged for teachers and students on the impact of quality assurance in the teaching and learning of Biology in senior secondary schools in Bosso Local Government Area of Niger State.

3.5.2 Questionnaire

Questionnaires were given out for the purpose of this research work, so as to ascertain the impact of quality assurance in teaching and learning of Biology in senior secondary schools in Bosso Local Government Area of Niger State. The students' questionnaire contains section A

and B. Section ‘A’ contains the student biodata such as name of the school, class and gender, while Section B contains instructions and statements or questions from each of the research questions. The teachers' questionnaire also contains section A and B. Section ‘A’ contains the teachers' biodata such as name of the school, class, subject taught, gender and qualification, while Section B contains instructions and statements or questions from each of the research questions.

3.6 Validity of Instrument

The instrument (draft questionnaire) for data collections was validated by two experts (Lecturers). The instruments were at first given to lecturers and planners for their comments. Necessary modifications were made based on their feedback. Some questions were removed and some were re-modified. The approved instrument was given to some experienced, test measurement and evaluation expertise. The content and face validity of the questionnaires were obtained through a test rates method that led to the production of a set of questionnaire numbering 1-20 items which was divided into sections covering the areas of investigation of the study.

3.7 Reliability of Instrument

Reliability test was conducted in Hiltop model secondary School Minna which was not among the sampled schools used for the research. The result was established through test retest and application of Pearson-product moment correlation coefficient reliability. The items on the questionnaire had reliability coefficient of 0.81 using Cronbach alpha methods indicating that the items were reliable.

3.8 Method of Data Collection

The researcher took permission from the management of the sampled schools to get approval in order to sample Biology students and teachers from the selected senior secondary schools for the research. When the permission was granted, the researcher personally went round the schools to administer the questionnaire to the teachers and students to ensure validity and authenticity of the exercise. The respondents were briefed on the objectives of the study. Thereafter, the researcher administered the questionnaire to the teachers and students. The completed copies of the questionnaire were collected from the respondents for further analysis.

3.9 Method of Data Analysis

The data collected from the sampled students and teachers were analyzed using descriptive and inferential statistics. The descriptive statistics was used to provide answer to the research questions using mean and standard deviation. The mean responses below 2.5 were rejected while mean response of 2.5 and above were accepted.

CHAPTER FOUR

4.0 DATA ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

4.1 Distribution of Sample

Table 4.1 Distribution of students' and teachers' population based on gender

S/N	Name of school	Male Students	Female Students	Male Teachers	Female Teachers	Total
1.	Day Secondary School Maikunkele A'	10	15	2	3	30
2.	Model Science College Tundun Fulani	16	9	3	2	30
3.	Bosso Secondary School	11	14	4	1	30
4.	Maryam Babangida Girls Science College Minna	0	25	3	2	30
Total		**100**		**20**		**120**

Source: Researcher, 2021

Table 4.1 shows the distribution of sample for the study. From the table, one hundred (100) students and twenty (20) teachers were sampled, making a total of one hundred and twenty (120) respondents.

4.2 Analysis of Research Questions

Research Question One: Does the school environment contribute to effective teaching and learning of Biology?

Table 4.2: Mean and Standard deviation of response on school environment contribute to effective teaching and learning of Biology

Items	SA	A	D	SD	Mean	Std.Dev	Decision
1. My school is located by the road side and this is affecting the teaching and learning process in the school	43 (36%)	34 (28%)	26 (22%)	17 (14%)	2.86	2.54	Agree
2. I normally hear sound of passing vehicles from my classroom and therefore affecting my performance negatively	32 (27%)	39 (33%)	28 (23%)	21 (17%)	2.69	2.37	Agree
3. I perceive unpleasant smell from my school environment, making me irritated during lessons	21 (18%)	28 (23%)	32 (26%)	39 (33%)	2.26	2.01	Disagree
4. There are no enough chairs and desks in my classroom	49 (41%)	41 (34%)	19 (16%)	11 (9%)	3.03	2.70	Agree
5. My school environment is always noisy	24 (20%)	27 (23%)	31 (26%)	38 (31%)	2.31	2.07	Disagree

GRAND MEAN = 2.63

From the table above, the mean score of the 5 items used to answer research question one is 2.63 which is greater than the cut-off point of 2.5, hence it is agreed that the school environment contribute to effective teaching and learning of Biology.

Research Question Two: Does the utilization of instructional material contribute to effective teaching and learning of Biology?

Table 4.3: Mean and Standard deviation of response on utilization of instructional materials.

Items	SA	A	D	SD	Mean	Std.Dev	Decision
6. My Biology teacher uses instructional materials during Biology lessons	38 (32%)	35 (29%)	28 (23%)	19 (16%)	2.77	2.45	Agree
7. I am interested in lessons taught using instructional materials	52 (43%)	49 (41%)	11 (9%)	8 (7%)	3.21	2.80	Agree
8. I comprehend better when instructional materials are used for teaching	46 (38%)	42 (35%)	19 (16%)	13 (11%)	3.01	2.65	Agree
9. My teacher uses teaching aids relevant to the lesson	32 (27%)	41 (34%)	28 (23%)	19 (16%)	2.72	2.39	Agree
10. The use of instructional materials makes teaching and learning more meaningful to the students	50 (42%)	47 (39%)	17 (14%)	6 (5%)	3.18	2.76	Agree
GRAND MEAN = 2.98							

From the table above, the mean score of the 5 items used to answer research question one is 2.98 which is greater than the cut-off point of 2.5, hence it is agreed that the utilization of instructional materials contribute to effective teaching and learning of Biology.

Research Question Three: Is there enough laboratory equipment for Biology practical in senior secondary schools?

Table 4.4: Mean and Standard deviation of response on laboratory equipment for Biology practical

Items	SA	A	D	SD	Mean	Std.Dev	Decision
11. There is a Biology laboratory in my school.	57 (48%)	48 (40%)	11 (9%)	4 (3%)	3.32	2.88	Agree
12. The laboratory is well equipped with materials for Biology practical	22 (18%)	24 (20%)	36 (30%)	38 (32%)	2.25	2.00	Disagree
13. Microscope is present in the laboratory	23 (19%)	25 (21%)	32 (27%)	40 (33%)	2.26	2.02	Disagree
14. There are adequate plant and animal specimen in the laboratory	24 (20%)	28 (23%)	32 (27%)	36 (30%)	2.33	2.08	Disagree
15. Fire extinguisher is present in the school laboratory	23 (19%)	27 (23%)	31 (26%)	39 (32%)	2.28	2.04	Disagree
GRAND MEAN = 2.49							

From the table above, the mean score of the 5 items used to answer research question three is 2.49 which is less than the cut-off point of 2.5, hence it is agreed that there is no enough

laboratory equipment for Biology practical in senior secondary schools in Bosso Local Government Area of Niger State.

Research Question Four: Does the teachers' qualification enhance effective teaching and learning of Biology?

Table 4.5: Mean and Standard deviation of response on teachers' qualification

Items	SA	A	D	SD	Mean	Std.Dev	Decision
16. Students perform better taught by qualified and professional teachers	53 (44%)	44 (37%)	13 (11%)	10 (8%)	3.17	2.78	Agree
17. Teachers' qualification contribute to effective teaching of Biology	44 (37%)	39 (33%)	21 (17%)	16 (13%)	2.93	2.59	Agree
18. Students understand better when taught by teachers with many years of teaching experience	39 (32%)	32 (26%)	28 (23%)	23 (19%)	2.76	2.44	Agree
19. Students perform better in other subjects than Biology	23 (19%)	27 (23%)	32 (27%)	38 (31%)	2.29	2.05	Disagree
20. Biology as a subject should be taught by professionally trained teachers	38 (32%)	34 (28%)	27 (23%)	21 (17%)	2.74	2.36	Agree

GRAND MEAN = 2.78

From the table above, the mean score of the 5 items used to answer research question four is 2.78 which is less than the cut-off point of 2.5, hence it is agreed that the teachers' qualification enhance effective teaching and learning of Biology.

4.3 Discussion of the Findings

The research work was carried out to ascertain the impact of quality assurance in the teaching and learning of Biology in senior secondary schools in Bosso Local Government Area of Niger State. From the presentation and analysis of results in table 4.2, the mean score of the 5 items used to answer research question one is 2.63 which is greater than the cut-off point of 2.5. This clearly shows that the school environment contributes to effective teaching and learning of Biology. Students learn better when they are taught in a conducive environment, free from noise and smell and also a classroom that is less populated.

This finding is in agreement with the previous finding of Wabuoba (2011) who observed that overcrowding in classrooms makes it difficult for students to write, the teacher is also unable to move around the class to assist needy students, thus, affecting the teaching and learning process. Obayan (2003) also attested that school learning environment exerts some dominant influence on the learner. The learning environment encompassing in the teaching and learning process remains an important area that should be studied and well managed to enhance students'' academic performance. Similarly, Ayoo (2002) and Eshiwani (1993) were of the view that school environment such as classrooms, availability of desks and books have a direct impact on good performance among students in developing countries.

From the presentation and analysis of results in table 4.3, the mean score of the 5 items used to answer research question two is 2.98 which is greater than the cut-off point of 2.5. This implies that the utilization of instructional materials contributes to effective teaching and learning of Biology. When instructional materials are properly utilized in the teaching and learning process, it creates room for better understanding because the students are being exposed to real objects or

improvised ones which improve their knowledge of understanding. This finding is in line with Abimbade (1999) who attested that instructional materials when appropriately used, enhance learning, improves the competence of teachers and makes learning more meaningful to learners. He added that on the other hand, when these materials are misused due to lack of knowledge on how to use them, science teaching and learning process may be adversely affected.

Jatau (2008) also reported that when instructional equipment is appropriately utilized, they bring about more effectiveness in teaching and learning process, but this depends on teacher's ability to use them efficiently. Eshiet (1996) posited that non utilization of instructional materials in the teaching and learning process by the teachers, result to rote learning with all kinds of misconceptions, poor motivation, killing of morals and poor skill development.

From the presentation and analysis of results in table 4.4, the mean score of the 5 items used to answer research question three is 2.49 which is less than the cut-off point of 2.5. This clearly shows that there is no enough laboratory equipment for Biology practical in senior secondary schools. In this case, students may have limited knowledge in Biology since practical is one of the most important area in the teaching and learning of Biology. Sojibo and Nyong (2004) were of the view that schools with well-equipped laboratories for practical activities have better results in the certificate examination than those that are not well equipped. Pwal (2000) also hinted that laboratory equipment enhances learners' scientific understanding and interaction, with events and objects of performance of scientific interest which in turn influences the performance of learners. Exposing students to adequately equipped laboratory leads to activity based lesson in which individuals will be able to actively participate and interact.

From the presentation and analysis of results in table 4.5, the mean score of the 5 items used to answer research question four is 2.78 which is greater than the cut-off point of 2.5. This implies that the teachers' qualification enhances effective teaching and learning of Biology. This is in line with the finding of Owolabi (2012) who examined the effect of teacher's qualification on performance of senior secondary school students. The study found out that students taught by teachers with higher qualifications performed better than those taught by teachers with low qualifications. Similarly, a study carried out by Adaramola and Obomanu (2011) in Nigeria showed that lack of qualified teachers led to consistent poor performance of students in such subjects as, Science, Mathematics, and Technology. All these point to the importance of qualified teachers in determining students' academic performance.

4.4 Summary of the Findings

From the findings of the study, both the teachers and Students were in agreement that the school environment contribute to effective teaching and learning of Biology.

Similarly, the teachers and students were also in agreement that the utilization of instructional materials also contribute to effective teaching and learning of Biology.

On the basis of laboratory equipment, the teachers and students agreed that there is no enough laboratory equipment for Biology practical in senior secondary schools in Bosso Local Government Area of Niger State.

Finally, the teachers and students were also in agreement that the qualification of teachers enhances effective teaching and learning of Biology.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the study, draws conclusion and makes recommendations and suggestions for further research.

5.2 Summary

The study was carried out to ascertain the impact of quality assurance in the teaching and learning of Biology in senior secondary schools in Bosso Local Government Area of Niger State. Four (4) senior secondary schools were randomly selected within Bosso Local Government Area of Niger State for the research work. Four research questions were raised to guide the study and tested in an attempt to find answers to the research questions.

A sample of one hundred (100) students and twenty (20) teachers were randomly selected from the four senior secondary schools, making a total of one hundred and twenty (120) respondents. The research instrument used for the collection of data was questionnaire. The research questions in chapter one of the study constitute the basic foundation for the construction of the questionnaire.

Major Findings

The major findings of the study were:

i. The school environment can contribute to effective teaching and learning of Biology.

ii. The utilization of instructional materials can also contribute to effective teaching and learning of Biology.

iii. There is no enough laboratory equipment for Biology practical in senior secondary schools in Bosso Local Government Area of Niger State.

iv. The teachers' qualification can enhance effective teaching and learning of Biology.

5.3 Conclusion

The practice of quality assurance in the teaching and learning of Biology cannot be over emphasized. Therefore, the researcher believes that this research work will serve as a reference and avenue for other researchers who wish to go into more finding and to upgrade the research work for the fact that many factors such as poor attitude of teachers to work, inadequate teaching aids, poor organization of Biology practical, employing unqualified teachers and lack of laboratory maintenance practices are said to be responsible for poor implementation of quality assurance mechanism in the teaching and learning of Biology. Therefore, efforts should be made by all stakeholders in Education to provide the enabling environment for effective implementation of quality assurance in formal Education.

5.4 Recommendations

To address the problem of quality assurance in the teaching and learning of Biology, the followings are recommended.

1. Government should make a concerted effort to provide facilities and equipment in schools to cater for the needs of teachers and students. Teachers and students should also ensure that the available equipment is properly utilized to achieve the intended result. In addition, the equipment provided should be properly maintained to ensure their longevity and continued usefulness.

2. Regulatory bodies should be more committed to the monitoring and supervision of the application of quality assurance mechanisms. They should carry out their functions without bias, corruption and should enforce sanctions where necessary.

3. Schools should employ more teachers with good qualifications to match the students' population. Instructional policies should be revised to ensure that more emphasis is paid on teaching effectiveness of teachers for better quality education.

4. Appropriate quality assurance policies should be formulated and implemented. This is because they are important in guiding the development and implementation of quality assurance mechanisms. Such policies should specify and clearly define standards which all stakeholders should be familiar with.

5. Adequate funding is inevitable in the teaching and learning of Biology. Therefore, as a matter of urgency, Government should adopt and implement the international standard of 26% budgetary allocation to education.

6. Methodology of instruction should be more pragmatic. Emphasis should shift from teacher-oriented to more participatory learner-oriented methods. To achieve this, necessary requirement must be put in place.

5.5 Limitations of the Study

There were many limitations with this research that could make a great difference in the

discussion of the results and also the validity and reliability of the research questions.
The first limitation was regarding to the amount of time that i had available to conduct

this study. With a more extended time, the researcher could find additional resources to help answer the research questions.

A second limitation is related to the survey sample. Due to the limited number of participants, the researcher was not able to have a broader range of responses.

The study was initially developed for several classes of students from Bosso local Government Area of Niger State. However, it was restricted to four selected senior secondary schools, which may affect a generalized conclusion in the state.

It would be useful if the researcher could use more students from different schools which would help in gaining more information.

This study would have generated more reliable results with multiple data sources, such as interviews with both teachers and students, including classroom observations, laboratories and the school environment at large. Using data from different sources would allow the researcher to use a mixed method where data would be collected and consequently give validity to the results of this study.

5.6 Suggestions for Further Studies

1. The result from the study suggest that the practice of quality assurance can be improved through the provision of adequate laboratory equipment, conducive learning environment, appropriate and effective use of instructional materials during teaching and learning process.

2. This study can equal be improved by addressing the weaknesses of the study. For example, future research could duplicate the study and build up more on the topic.

3. Future research could include a larger population comprised of both male and females. It would also be beneficial to study the impact of quality assurance across higher institutions.

4. Since the main aim and objectives of education is to increase academic skill

development, it would be very thoughtful to examine the practice of quality assurance in secondary schools.

5. Teachers with a few years of professional experience should manage small class sizes as this will increase their level of both behavioural and instructional engagement.

REFERENCES

Abimbade, A. (1999). Principles and practices of educational technology, Ibadan: International publishers limited.

Adeogun, A. A. (2001*). Instructional resources and school effectiveness in private and public secondary schools in Lagos State. Lagos Journal of Educational Administration and Planning* 1(i) 74 – 81.

Ajewole, G.A. (2005). Science and Technology Education in Secondary Schools: Need for manpower development. *Journal of Science Teachers Association of Nigeria, 40. (1 & 2) 63-68. Education Sector Support Programme in Nigeria ESSPN* (2009). Quality Assurance: Position Paper, Abuja.

Ajuoga , M. , Indoshi, F., & Agak, J. (2010). Perception of quality assurance and standards officers about their competence: Implications for training, Educational Research 1(4): 112-117. Nairobi: Nairobi Act Press.

Akinbobola, A.O. (2011b). Teaching methods, study habits, school location and gender factors as determinants of retention ability of physics students in Nigeria senior secondary schools.

Balter, Dana & William D. D (2008), "Recruiting Highly Qualified Teachers: Do District Recruitment Policies Matter?" Public Finance Review 36:1, 33-62.

Barcelona, 46-59.

Ejiogu, M.E. (1986). Landmarks in Educational Development in Nigeria. Joja Publishers Ltd.,14.

Eshiet, I.T. (1996). Improvisation in Science teaching philosophy and practical. Abak Belpot press.

Eshiwani G.S. (1993). Factors influencing performance among primary and secondary school pupils in Western province, Nairobi Kenya. Unpublished research report. A Bureau of Educational Research, Kenyatta University.

Fafunwa, Babs (1967). New Perspectives in African Education. London: Macmillan Education Ltd., 55-57.Federal Government of Nigeria (2004). National Policy on Education, Abuja. Ipaja, (2010)

Habibu, A, (2011) Evaluation of the Implementation of the Universal Basic Education Policy (UBE) of selected States: A comparative study of Kaduna, Katsina and Zamfara from 1999-2009, Unpublished Ph.D. Dissertation Submitted to the Department of Public Administration, Ahmadu Bello University, Zaria. Journal of Educator, Zaria, 1 (1) 65.

Hattie, J. O. (2003). Opportunity Wages, Classroom Characteristics, and Teacher Mobility. Southern Economic Journal, 5(1), 165-178.

Ipaja, (2010), Lagos State Ministry of Education (2012). Annual School Census Report 2011-2012.

Jatau AA and Jatau Sy (2008). Identification of Level of Utilization of instructional Resources among Science Teachers in pankshin: STAN 49 Annual Conference Proceedings.

Kimeu, J.M. (2010) Influence of secondary school Principals Instructional supervision practices on Kenya Certificate for Secondary Education Performance in Kasikeu Division unpublished M.Ed Project University of Nairobi.

Lagos State Ministry of Education (2012). Annual School Census Report 2011-2012.

Lyons, J.(2012).Workers of Tomorrow, Education in progress, Ministry of Education and Scientific research. Forth Fortis. Fiji.

Macmillan.Ufondu, N.U. (2009). The Role of the laboratory on the Academic Achievement of Students in Biology in Abakaliki Education Zone of Ebonyi State: Unpublished B.Sc. Ed thesis. Abakaliki, Ebonyi State University.

Manickam, K., & Begun, A.J(2011). Quality assurance in teacher education. In F.jenefar & A.J. Begun, (Eds.) Teacher education quality indicators. New Delhi: APH Publishing corporation.

Obamanu, B.J. & Adaramola,, M.O. (2011). Factors related to under achievement in science, technology and mathematics education in secondary schools in Rivers state, Nigeria. World Journal of Education. 1(1), 102-109.

Obayan, P. A. I. (2003). Realizing Nigerian Millennium Education Dream: The UBE in Bamisaiye M.O.,Nwazuoke and Okediran (Eds). Education this Millennium. Ibadan.

Odubunmi, E.O. (2011). Improving science teacher education programme through research based strategy. Science Education, 12 (1) 46-50.

Ofoegbu, T.O. (2005). Effects of students' involvement in the production of instructional materials on their academic performance in Biology. Journal of Science Teachers Association of Nigeria, 40 (1 & 2) 74-80.

Okebukola, F.O. (2008). Rethinking the meaning of reforms: Contemporary challenges for practitioners in literacy and language education. International Reading Association, New York, 122-131.

Okebukola, F.O. (2009). Implementation of the language policy: Beyond rhetoric to empiricism. Journal of Nigerian Languages and Culture, 11 (1) 45-54.

Okebukola, F.O. (2012). The view of Nigerian teachers in public and private primary schools on the teaching of early literacy. United Kingdom Literacy Association

Okebukola, P.A. et al (2007). Quality assurance in higher education: perspectives from sub-Saharan Africa. In Gumi (ed.) State of the world report on Quality Assurance in Higher Education.

Okebukola, P.A.O. (1998). Curriculum implementation in Nigeria: Strategies for the 21st century. Lagos State University.

Okeke OJ (2015) A Paper titled Strategies for Ensuring Quality Standard in Degree chemistry education presented to Academic Forum (TAF) on 17th-19 Sept. 2015 in ESCET in Affiliation to Nnamdi Azikiwe University Awka. Anambra State

Okereke, E. C. (2014) "*Strategies for Ensuring Quality in the Business Education Programme of Tertiary Institutions in Anambra State Department of Business Education*. Madonna University Okija-Onitsha Anambra State An International Multidisciplinary Journal. Ethiopia Vol. 8 (1). Serial No. 32. January 2014:321-336 ISSN 1994-9057

Olaniyonu, S. (2002). Utilization and management of resources for quality education in secondary schools in Lagos State. New Dimensions in Educational Development, LASU, Faculty of Education.

Oluremi, O. F. (2013). *Enhancing education effectiveness in Nigeria through teacher's professional development*. European Science Journal 9, 422-431

Onukaogu, E.E. (2001). Teacher effectiveness as a factor in the reading empowerment of the nursery and elementary school. African Child. In S. Manaka (ed.) Proceedings of the 1st Pan African Reading for All Conference. Pretoria. International Reading Association/UNESCO 181-192.

Owolabi O. T. (2012). Effect of teacher's qualification on the performance of senior secondary school physics students: Implication on technology in Nigeria Retrieved from www.irepos.unijos.edu.ng

Owolabi, T. and Okebukola, F.O. (2010). Implementation of school curricula in nigeria: The pathways, contours and intervention. In Nworgu, A.B. and Busari, J. (eds) Human capacity development for vision 2020. Proceedings at the25th Annual congress of the Nigerian Academy of Education, Balyesa 8-12 Nov. Abuja NERDC.

Owolabi, T.; Okebukola, F. and Dansu, T. (2011). Teacher preparation and participation in language and the sciences. Paper presented at the UNESCO conference on Quality Assurance, Bamako.

Punch (2011). Tell government to give us chairs and tables. 4th FebruaryTaiwo, C.O. (1982). History of Education in Nigeria. Lagos

Wiley & Blackwell 94-100.Okebukola, F.O. and Apari, W.J. (2010). A comparative study of the performance of emergent readers in public and private schools in reading skills. In P. Anyanwu and I. Obuasi (eds.) Issues in Language and Human Development. A Fetcschrift for Mr. Okonkwo, Enugu. RAM 133-146.

Willikepa (2013). The free encyclopedia accessed 15th April 2013.World Bank (1990). World Bank Policy Paper. The World Bank, Washington DC.

APPENDIX A

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION (SSTE)

DEPARTMENT OF SCIENCE EDUCATION

QUESTIONNAIRE ON IMPACT OF QUALITY ASSURANCE IN THE TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF NIGER STATE.

STUDENTS' QUESTIONNAIRE

SECTION A: Student Biodata

Name of School: ….....…….….….....

Class: .....

Gender: Male [ ] Female [ ]

SECTION B

Instruction: Kindly tick (√) the appropriate option in the column that corresponds with your view

Use the keys below as a guide to tick as appropriate

SA- Strongly agree **A- Agree**

D- Disagree **SD- Strongly disagree**

Does the school environment contribute to effective teaching and learning of Biology?

S/N	STATEMENT	SA	A	D	SD
1	My school is located by the road side and this is affecting the teaching and learning process in the school				
2	I normally hear sound of passing vehicles from my classroom and therefore affecting my performance negatively				
3	I perceive unpleasant smell from my school environment, making me irritated during lessons				
4	There are no enough chairs and desks in my classroom				
5	My school environment is always noisy				
	Does the utilization of instructional material contribute to effective teaching and learning of Biology?				
	STATEMENT	**SA**	**A**	**D**	**SD**
6	My Biology teacher uses instructional material during Biology lessons				

7	I am interested in lessons taught using instructional materials				
8	I comprehend better when instructional materials are used for teaching				
9	My teacher uses teaching aids relevant to the lesson				
10	The use of instructional materials makes teaching and learning more meaningful to the students				
	Is there enough laboratory equipment for Biology practical in senior secondary schools?				
	STATEMENT	**SA**	**A**	**D**	**SD**
11	There is a Biology laboratory in my school				
12	The laboratory is well equipped with materials for Biology practical				
13	Microscope is present in the laboratory				
14	There are adequate plant and animal specimen in the laboratory				

15	Fire extinguisher is present in the school laboratory				
	Does the teachers' qualification enhance effective teaching and learning of Biology				
	STATEMENT	**SA**	**A**	**D**	**SD**
16	Students perform better when taught by qualified and professional teachers				
17	Teachers' qualification contribute to effective teaching of Biology				
18	Students understand better when taught by teachers with many years of teaching experience				
19	Students perform better in other subjects than Biology				
20	Biology as a subject should be taught by professionally trained teachers				

APPENDIX B

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION (SSTE)

DEPARTMENT OF SCIENCE EDUCATION

QUESTIONNAIRE ON IMPACT OF QUALITY ASSURANCE IN THE TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF NIGER STATE.

TEACHERS' QUESTIONNAIRE

SECTION A: Teachers' Biodata

Name of School: ….....…….….…..

Class: .....

Subject Taught: .....

Gender: Male [ ] Female [ ]

Qualification: .....

SECTION B

Instruction: Kindly tick (√) the appropriate option in the column that corresponds with your view

Use the keys below as a guide to tick as appropriate

SA- Strongly agree **A- Agree**

D- Disagree **SD- Strongly disagree**

Does the school environment contribute to effective teaching and learning of Biology?

S/N	STATEMENT	SA	A	D	SD
1	My school is located by the road side and this is affecting the teaching and learning process in the school				
2	I normally hear sound of passing vehicles from my classroom and therefore affecting my performance negatively				
3	I perceive unpleasant smell from my school environment, making me irritated during lessons				
4	There are no enough chairs and desks in my classroom				
5	My school environment is always noisy				
	Does the utilization of instructional material contribute to effective teaching and learning of Biology?				
	STATEMENT	**SA**	**A**	**D**	**SD**
6	My Biology teacher uses instructional material during Biology lessons				

7	I am interested in lessons taught using instructional materials				
8	I comprehend better when instructional materials are used for teaching				
9	My teacher uses teaching aids relevant to the lesson				
10	The use of instructional materials makes teaching and learning more meaningful to the students				
	Is there enough laboratory equipment for Biology practical in senior secondary schools?				
	STATEMENT	**SA**	**A**	**D**	**SD**
11	There is a Biology laboratory in my school				
12	The laboratory is well equipped with materials for Biology practical				
13	Microscope is present in the laboratory				
14	There are adequate plant and animal specimen in the laboratory				

15	Fire extinguisher is present in the school laboratory				
	Does the teachers' qualification enhance effective teaching and learning of Biology				
	STATEMENT	**SA**	**A**	**D**	**SD**
16	Students perform better when taught by qualified and professional teachers				
17	Teachers' qualification contribute to effective teaching of Biology				
18	Students understand better when taught by teachers with many years of teaching experience				
19	Students perform better in other subjects than Biology				
20	Biology as a subject should be taught by professionally trained teachers				

RESEARCH INSTRUMENT VALIDATION FORM

Sir/Ma;

The candidate JONAH ANNUNE TARLUMUN with Admission Number 2017/3/69270BE is a student of the department. You are requested to make amends or inputs that will improve the quality of the instrument. Your professional expertise is expected to assist the researcher towards the award of the degree.

Thank you.

Head of Dept. Science Education
10 JUN 2021
Fed. University of Tech. Minna

Dr. Rabiu M. Bello

HOD (Signature, Date & Official stamp)

Title of the Research Instrument: IMPACT OF QUALITY ASSURANCE IN THE TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF NIGER STATE

SECTION A

1. Appropriateness of the Research Instrument title: Okay
2. Suggest amendment if not appropriate: N/A
3. Completeness of Bio-data Information: Satisfactory
4. Suggest inputs if incomplete ~~questionnaire for teachers~~ Okay ✓
5. Suitability of items generated Suitable with slight adjustment
6. Structure of the questionnaire/ test items generated I suppose the items for the students & teachers be aligned to each in same
7. Structure of the instrument in line with the objectives of the study. Satisfactory
8. Items coverage and distribution across constructs and domains measured Satisfactory
9. Appropriateness of the instrument in relation to the type of data to be collected Yes - Okay
10. What is the general overview and outlook of the instrument? The instrument is okay, Subject to effecting the observed corrections
11. Rate the Instrument between 1-10

7

SECTION B

Name of the validator: Dr. A-U. Bashir Yankuzo

Designation/Rank: LII

Name of institution: F.U.T Minna

Department/ School: Science Education

Telephone No/GSM No: 08065542625

E-Mail Address: bashir.au@futminna.edu.ng

23/06/2024

Signature, Date and stamp (if available)

RESEARCH INSTRUMENT VALIDATION FORM

Sir/Ma;

The candidate JONAH ANNUNG TARLUMU with Admission Number 2017/3/69270BE is a student of the department. You are requested to make amends or inputs that will improve the quality of the instrument. Your professional expertise is expected to assist the researcher towards the award of the degree.

Thank you.

Head of Dept. Science Education
10 JUN 2021
Fed. University of Tech. Minna

Dr. Rabiu M. Bello

HOD (Signature, Date & Official stamp)

Title of the Research Instrument: IMPACT OF QUALITY ASSURANCE IN THE TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF NIGER STATE

SECTION A

1. Appropriateness of the Research Instrument title: Is Appropriate
2. Suggest amendment if not appropriate: —
3. Completeness of Bio-data Information: —
4. Suggest inputs if incomplete —
5. Suitability of items generated Suitable
6. Structure of the questionnaire/ test items generated Is Standard
7. Structure of the instrument in line with the objectives of the study. Is Okay
8. Items coverage and distribution across constructs and domains measured Is Okay
9. Appropriateness of the instrument in relation to the type of data to be collected Is appropriate
10. What is the general overview and outlook of the instrument? Simple and Clear
11. Rate the Instrument between 1-10 8

SECTION B

Name of the validator: Mrs Sarah Bawa

Designation/Rank: Ass. Lecturer

Name of institution: FUT Minna

Department/ School: Science Education

Telephone No/GSM No: 07056590755

E-Mail Address: _____

22/8/2024

Signature, Date and stamp (if available)