EVALUATION OF THE IMPLEMENTATION OF BASIC SCIENCE CURRICULUM FOR JUNIOR SECONDARY SCHOOLS IN ENUGU STATE

BY

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MARCH, 2016.

TITLE PAGE

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PROJECT PRESENTED TO THE DEPARTMENT OF SCIENCE EDUCATION, UNIVERSITY OF NIGERIA NSUKKA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTERS DEGREE IN SCIENCE EDUCATION

SUPERVISOR: DR. L. N. NWORGU

MARCH, 2016

CERTIFICATION

This is to certify that **CHUKWUNTA REGINA UGOCHI**, a postgraduate student in the Department of Science Education with REGISTRATION NUMBER: PG/MED/SD/09/50405 has satisfactorily completed the requirements for the award of the Degree of Masters in Science Education (Biology Education). The work embodied in this Thesis is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

_____	_____
CHUKWUNTA REGINA UGOCHI	**DR. L. N. NWORGU**
Student	Supervisor

DEDICATION

This work is dedicated to my dear husband Engr. P I C Chukwunta who worked hard to see that this dream turned reality.

ACKNOWLEDGEMENTS

I am immensely grateful to God Almighty for the good health, divine favour, provisions and protection granted unto me throughout the period of this research work.

My special appreciation goes to my supervisor Dr.Mrs. L. N. Nworgu for her patience in reading and making meaningful corrections and suggestions in this work. Her invaluable advice and kindness propelled me from the beginning of this study to the end. May God bless and reward her abundantly.

My fervent thanks go to Dr. B. C. Madu, Dr. Mrs Ebere Ibe, and Mr. C. S.Ugwuanyi who validated the instruments used for data collection and also read through the entire work with critical suggestions made. I am especially grateful to Dr. J. J. Agah and Dr. Queendy for their immense assistance and for providing me with some of the materials needed for this work. May God bless them abundantly

Equally appreciated are the following friends and colleagues Mercy, Ifeoma and Ijeoma for their prayers and encouragement. I pray that God will bless them all.

I owe undivided appreciation and respect to my dear husband Engr. P I C Chukwunta, for his love, care, endurance, continuous encouragement both morally and financially which spurred me successfully to the end of this programme. May the good Lord bless and reward him with long and healthy life in Jesus name Amen.

Finally, I love and thank my children Chimezie, Chimaobi, Chisom, Amarachukwu, Chibueze, Chiamaka and Chinemerem for their prayers and support. May God bless them abundantly for me in Jesus name Amen.

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ABSTRACT

The main purpose of this study was to evaluate the implementation of Basic Science Curriculum in Junior Secondary Schools (JSS) in Enugu Zone. Nine research questions and one hypothesis guided the study. The study adopted an Evaluation research design. The study was carried out in Enugu Education Zone of Enugu State. A total number of 74 Basic Science teachers and 6,386 JSSIII Students make up the population of the study. A sample of 319 JSSIII students and 37 Basic Science teachers were used for the study. Basic Science Achievement Test (BSAT), and a researcher constructed questionnaire titled Basic Science Curriculum Implementation Process Questionnaire (BSCIPQ) were used for data collection for the study. The instruments were validated by three experts, one from measurement and evaluation and two from science education, all from the University of Nigeria Nsukka. Based on their observations, criticisms and corrections, the research instruments were modified appropriately. The reliability of the instruments BSAT and BSCIPQ were established by trial testing them on a group of 40 JS3 students and 20 Basic Science teachers from one secondary schools in Agbani Zone which is outside the area of the study. Estimate of internal consistency was used to determine the reliability of BSAT and BSCIPQ. Specifically, Kuder Richardson formula 21 (K-R21) was used for BSAT and Cronbach's alpha for BSCIPQ. The reliability index for BSAT was 0.81. Also the reliability indices for BSCIPQ were 0.83, 0.86, 0.83, 0.81 and 0.89 for cluster A, B, C, D and E respectively. Copies of BSAT and BSCIPQ were administered by the researcher on the spot to the respondents with the help of two research assistants who were given one day training by the researcher on how to administer and retrieve the achievement tests and questionnaires. Scores obtained from the instruments BSAT and BSCIPQ were analyzed using mean (x) and standard deviation (SD) in order to provide answers for the research questions while the null hypothesis was tested using t- test statistics at 0.05 level of significance. The findings of the study among others showed that the extent to which teachers align their instruction to the achievement of the objectives of Basic Science curriculum in junior secondary schools is low. Findings also revealed that some facilities for teaching Basic Science in junior secondary schools were available and functional while many facilities are not available. It was also found that Basic Science teachers utilize the facilities and instructional materials in teaching Basic Science at junior secondary schools to a low extent. The implication of the above findings were highlighted and it was recommended among others that since the result of the study showed that the achievement of the objectives of Basic Science curriculum in junior secondary schools is to a low extent, the government and ministry of education should make available the necessary materials and man-power for the implementation of the objectives of Basic Science curriculum in junior secondary schools. This will help the government to assess and judge their preparedness in the implementation and support for Basic Science Programme in the State.

CHAPTER ONE
INTRODUCTION

Background of the Study

The term science has to do with nature. It is derived from the Latin word "Scientia' meaning to know, what is a fact, truth or certain (Odo, 2012). Science is concerned with finding out about things in our environment. The knowledge we gather about our environment constitutes the field of study called science and is distinguished from other fields because it relies on hypothetical deductive and experimental approach, (Millennium Development Goals, MDGs project, 2011). Mbajiogu (2003) perceived science as an act of doing and it is more concerned with various investigative processes and activities with regards to developing, acquiring and controlling knowledge, skills and attitude about the natural factors of the environment.

Science has two major components namely science content and science process. The content is the knowledge we acquire about our environment while the process skills deal with ways in which scientists go about gathering knowledge concerning the environment (MDGs Project, 2011). Thus, science is viewed as the bedrock upon which any nation can be built (Onah, 2003). It is said to be a very important aspect of man's life so much that its role in societal development has been revealed by various countries world-wide. No country can be globally recognized without talking about its scientific advancements. This can be seen in all aspects of life such as medicine, engineering, industries, education etc. These scientific fields are all guided by a curriculum. This is why Nzewi, (2008) stressed that the quality of education in any system and at any level is dependent on the quality of the curriculum.

Curriculum is viewed as a body of all the experiences and activities (Co-curricular activities) provided, under the auspices of the school to bring about a change in the learner in the desired direction (Ugwu, 2004). This view is supported by Offorma, (2006) who noted

curriculum as a document, plan or blue print for instructional guide for teaching and learning with the purpose of achieving educational goals and related specific objectives that will necessitate the positive and desirable behavioral change in the learners. Offorma further buttressed that curriculum is also the process of determining and pursuing set societal objectives through the instrumentality of the school. Based on the above definition, the researcher explained that curriculum is the totality of the environment in which education takes place. In the same vein, curriculum according to Wheeler (2000) has been defined as the planned experiences offered to a learner under the guidance of the school. The researcher views the curriculum as the totality of planned learning experiences which the learner will acquire under the guidance of approved educative agencies like home and school in order to realize his or her needs, interests and aspirations for the benefit of the society. Thus, Adeyegbe (2004) submitted that curriculum generally is the hub of the activities in any educational endeavor since it dictates what is to be taught, at what level, by whom, for what purpose, with what equipment and to be assessed by what means. The curriculum describes the content, instructional objectives, teachers activities, students activities, teaching methods, the learning materials and evaluation strategies available for a given subject or course of study.

It is important to note that education has remained an instrument of change and national development and is viewed as the foundation for modernization. This modernization is required for great advances in science and technology (Okoro, 2006). Hence, in 1968, the Science Teachers Associates of Nigeria (STAN) set up curriculum development committees which looked into the different science subject's syllabuses (Mathematics, Chemistry, Physics and Biology) in the view to revise and improve them (Okoro, 2006). This was as a result of the directive given by the West African Examination Council (WAEC). After these works on

seperate science subjects, jointed working sessions of the representatives from the core science committees made efforts to integrate the disciplines. The working sessions produced the integrated theme known as Nigeria Integrated Science Project (NISP) which was approved in Lagos in 1969 (Ezeudu, 2008).

In 2005, the Nigeria Educational Research and Development Council (NERDC) was directed to carry out the assignment of reviewing, re-structuring and re-aligning the then existing curriculum for primary and junior secondary schools to fit into 9-year Basic Education Program, all in effort to attain the Millennium Development Goals (MDGs) by the year 2015 which include; value re-orientation, poverty eradication, job creation, wealth generation as well as using education to empower the people (FRN, 2006). In line with the above, the Federal Government of Nigeria in 2006 launched a new curriculum for the Universal Basic Education (UBE) for Primary and Junior Secondary Schools. This UBE programme was formally introduced in 1999 in fulfilment of the governments' signatory to a number of international declarations on Education which includes the Jomtien Declaration of Framework for Action on Basic Education. The UBE Act was passed into law in the year 2004 (Tahir, 2005). Tahir further explained that at the end of nine years of continuous education, every child should acquire appropriate level of literacy, numeracy, communication, manipulative and life skills, be employable, useful to him/her and the society by possessing relevant ethical, moral and civic values. Thus, the vision of UBE has taken care of all that it entails to bring socio- economic development.

The new curriculum is then thought to address other issues that were not specified in the old version of it in order to bring about value re-orientation, poverty eradication, critical thinking, and entrepreneurial or life skills among her citizens. In addition, the new curriculum

according to Obioma, the then executive secretary of the Nigeria Educational Research and Development Council (NERDC) seeks to correct the abnormalities of the former curriculum. Thus, the Universal Basic Education is to provide a universal, free, compulsory and continuous 9 years education programme for all school age children irrespective of their socio- economic circumstances (Federal Republic of Nigeria, FRN 2006)

However, since the vision of UBE is to bring about socio-economic development as explained by Tahir (2005), the role of science and technology in the UBE Programme cannot be over- emphasized. The world–over, it is generally agreed that development could only be meaningful if and when it is science and technology driven. As such, countries of the world are now categorized as developed, developing or under developed based on their scientific and technological attainments. Hence the incorporation of Basic Science and technology as a core subject in the 9- year Basic Education Programme.

A feature of the new curriculum is the phasing out of primary science and integrated science as earlier mentioned, for what is now known as Basic Science and Technology for primary schools and Basic science for junior secondary schools, which according to the Obioma (2007) prepares a child adequately for the higher studies by providing a solid foundation on which to build upon. Also added was information & communication technology (ICT) which has been introduced into the primary school curriculum alongside with culture and creative arts, all these are in the bid to make a child strong enough to face challenges of the future.

Basic Science is a science that describes the most basic objects, forces, relations between them and laws governing them such that all other phenomena may be in principle derived from them (free encyclopedia, 2011).

The objectives of new Basic Science curriculum are spelt out to enable the learner:

- Develop interest in science and technology,
- Acquire basic skills in science and technology ,
- Apply their basic knowledge and skills in science to meet societal needs.
- Take advantage of the numerous career opportunities offered by the study of science and technology and
- Become prepared for further studies in science and technology (NERDC, 2007).

From these, it is perceived that Basic Science Objectives are broad, specific and sequential such that interest in science and technology precedes the basic knowledge and skills of science and technology. Nonetheless, the Basic Science curriculum contents are systematically organized and arranged in a sequential order at the various levels of the Nigeria education system (Law in Okoye and Igboabuchi, 2011).The curriculum reflects depth, appropriateness and inter-relatedness of the contents.

In the light of the forgoing, it is important to note that in spite of persistent efforts made by the government, NERDC, curriculum specialist, teachers, parents and other relevant stakeholders in the education industry in order to achieve the above commendable objectives, the basic science curriculum seems not to be producing the desired outcomes which is quite underwhelming. These underwhelming outcomes could be as a result of poor implementation of the basic science curriculum. However, the actual implementation of the project (basic science curriculum) kicked off with a lot of schools having no qualified basic science teachers, no laboratory, inadequate instructional materials, scanty classrooms etc. Although many workshops and conferences have been held, yet curriculum outcomes remain issues of great concern. That is why Osuala and Ogomaka (2005) observed that despite the workshops and annual conferences, there is continually persistent poor student's performance in basic science due to

poor teaching methods used by teachers which are geared towards implementation of the new curriculum.

The beauty of any well-designed curriculum is in its full implementation. Curriculum implementation is referred to as day-to-day activities, which school management and classroom teachers undertake in the pursuit of the objective of any given curriculum. In this study, it means processes involved in translating educational plan into action to bring about change in the learner as they acquire the planned experiences, skills, and knowledge that are aimed at enabling the learner function effectively in the society. In this regard, implementation is seen as both the means and the means to an end. Objectives of any level of education cannot be achieved if the planned programme for such level of education is not well implemented. Observing this, Onyeachu (2008) asserted that: no matter how well a curriculum of any subject is planned, designed and documented, implementation is important. This is because the problem of most programmes arises at the implementation stage. Recognizing this, Babalola (2004) and Mkpa (2005) remarked that, it is at the implementation stage that many excellent curriculum plans and other educational policies are marred without any trace.

Different scholars have defined the term curriculum implementation in different ways. Garba (2004: 136) viewed curriculum implementation as: “putting the curriculum into work for the achievement of the goals for which the curriculum is designed.” Okebukola (2004) described curriculum implementation as “the translation of the objectives of the curriculum from paper to practice.” Ivowi (2004) defined curriculum implementation in a nutshell as “the translation of theory into practice, or proposal into action” Onyeachu (2008) viewed curriculum implementation as the process of putting all that have been planned as a curriculum document into practice in the classroom through the combined effort of the teachers, learners, school

administrators, parents as well as interaction with physical facilities, instructional materials, psychological and social environment. All these definitions show that curriculum implementation is the interaction between the teachers, learners and other stakeholders in education geared towards achieving the objectives of education.

The teachers and learners must interact in school environment using teaching methods and approaches for the achievement of instructional objectives. Successful implementation of curriculum requires understanding the power relationships, the traditions, the roles and responsibilities of individuals in the school system. Implementers (whether they be teachers principals, district education officers) must be well-versed with the contents of the curriculum; they must be clear of the purpose, the nature, and the real and potential benefits of the innovation.

Implementing a curriculum requires the involvement of many different people. Each is a "key player" in the change process. Without the coordinated involvement of these individuals, the implementation of the curriculum programme will encounter many problems. The teachers are the most important persons in the curriculum implementation process. With their knowledge, experience and competencies, teachers are central to any curriculum improvement effort.

Teachers are most knowledgeable about the practice of teaching and are responsible for introducing the curriculum in the classroom. According to Ben-Preetz (1990), the classroom teacher ensures the implementation of a curriculum by first studying the objectives of the curriculum, the themes and contents in the curriculum and brings the correct teaching method(s) that will be used in the classroom. The teacher also sets mechanisms in place for the evaluation of the efficacy of the curriculum content. To be able to function properly, the teacher must be a

professional by training. In other words, the teacher must have the basic educational foundation necessary for teaching. Such foundations include the knowledge of the teaching methods in the subject and teaching styles among others.

The teacher ought to have the needed professional interest, and motivation to excel. Hence, professional development of the teachers is an important factor contributing to the success of curriculum implementation. The teacher's expertise is necessary because they are the ones that manipulate the instructional resources and methods to realize the objectives of the subject they teach. Teachers of basic science, like their counterparts in other subjects, must possess the above qualities to effectively implement the curriculum content of basic science. If they possess the qualities, subject curriculum content will be effectively implemented but if not, the implementation of the curriculum will suffer some setbacks.

Besides the teachers, the achievement of the goals of basics science via the implementation of the curriculum content depends again on the use of adequate teaching methods by the subject teachers. There are so many methods of teaching basic science. According to Adekunle (2011), the methods of teaching basic science include simulation method, laboratory method, inquiry method, project method, demonstrations, question and answer method, field-trips, discussion method, lecture method, problem-solving method, dramatization method, home assignment and construction method. However, the achievement of the objectives of basic science does not only lie on the richness of the curriculum content, competence of the teachers and the availability of adequate teaching method(s) but also on the availability of resources for teaching the subject. This is coupled with teachers' mastery of the usage of these resources.

The chain-like interaction of the curriculum content, teachers, teaching methods and resources materials for teaching basic science in the curriculum implementation process is not complete without evaluation. In other words, curriculum implementation is not complete without evaluation. In this view, Onyemekeya (2001) opines that evaluation is an integral part of the curriculum. It involves the measurement and assessment of the entire curriculum to determine the extent to which learners have achieved the intended learning outcomes. In every learning environment, the learners, interest is supreme because all efforts are to make them learn. The teacher, after the teaching activity, evaluates his/her work to determine whether he/she has affected the desired changes in the learners or not.

Moreover, several factors could affect the implementation of Basic Science Curriculum such as teacher's competencies, instructional materials, school infrastructural/facilities and finance, MDGs project (2011). In the teaching and learning of Basic science, teachers are meant to use different strategies that will enhance the implementation process of the new curriculum account for the poor implementation of the curriculum. These strategies include practical exercises, written tests, oral tests (questions), experiments, fieldtrips, participation in class, assignments, presentation of real objects and use of instructional materials and models for teaching which are assumed to arouse and strengthen student's interest and desire to learn. However, after due implementation, evaluation showcases the exact picture of the outcome of the curriculum implementation process.

It then implies that the functionality of any curriculum lies in its implementation. Implementation is the process of putting a decision or a plan into effect; it is the execution of a plan, idea, model, design etc. It is the process of moving an idea from concept to reality (Onyemekeya, 2001). Implementation is the carrying out, execution or practice of a plan, a

method, or any design for doing something and as such, it is the action that must follow any preliminary thinking in order for something to actually happen (Adekunle, 2011). Curriculum implementation as viewed by Garba (2005) is "putting the curriculum into work for the achievement of the goals for which the curriculum is designed. Secondly, curriculum implementation as the process of putting all that have been planned as a curriculum document into practice in the classroom through the combined efforts of teachers, learners, school administrators, parents as well as interaction with physical facilities, instructional materials, psychological and social environment. All these suggest that curriculum implementation is the interaction between the teachers, learners and stake holders in education which is geared towards achieving the objectives of education. The objectives of any level of education cannot be achieved if the planned curriculum for such level of education is not well implemented. In recognizing this, Mkpa (2005) remarked that it is at the implementation stage that many excellent curriculum plans and other educational policies are marred without any trace. Thus, it becomes imperative to determine the effectiveness of the implementation stage of the curriculum through regular appraisal or evaluation.

Evaluation is the process of making value judgment or taking decisions about events, objects or their characteristic. In other words, it will be improper to conclude whether the system of education is qualitative or not without the evaluation of such a programme. Thus, education evaluation connotes a systematic appraisal of the quality of teaching and learning. Evaluation is also viewed as an assessment of the worth or merit of some educational objects or an assessment of the achievement of objectives and proving the success or failure of a programme (Tay and Hong, 2006). According to Adekunle (2011) these are the conventional views of evaluation. However, as the field of evaluation continued to develop, many researchers pointed out that the

evaluation process should be focused on gathering and reporting information that could help guide decision making in an educational programme and curriculum development. Nonetheless, while the models of evaluation differ in many of their details, the decision to choose an evaluation model in evaluating depends on a few important factors such as the evaluation questions, the issues that must be addressed, and the available resources (Garba, 2004). Nonetheless, evaluation aims to gather information to expound on the internal dynamics of how a programme operates. According to the above author,evaluation examines the experiences and activities involved in the learning situation. That is, making judgments about the process by which students acquired learning or examining the learning experience before it has been concluded.

Evaluation focuses on how something happens. Thus, evaluation includes the appraisal of instruction, the teachers' teaching and the students' learning. Teacher evaluation includes conducting evaluation on teachers' instructional methods, student teacher interaction, classroom interaction, teachers' characteristics, teachers' performance in the classroom and other dynamics of the teaching learning situation. This type of evaluation is carried out with the intention to help teachers enhance their performance in the teaching and learning process. Hence, it plays a formative role by helping to identify areas where teaching can be improved or a summative role in judging the effectiveness or otherwise of teaching and curriculum implementation as a whole.

It suffices to state that the objectives of Basic Science Curriculum can be achieved substantially, if the programme is carefully and appropriately implemented and evaluated by using the strategies stipulated in the national curriculum for junior secondary schools. Basic Science Curriculum makes provision for instructional materials. These are media that are used to facilitate the achievement of the goals of education. Relevant instructional materials have to be

provided for students which will help in the understanding of the concepts. Therefore, it is necessary that the implementation of curriculum be evaluated to determine the extent to which instructional materials are available and used by male and female junior secondary school basic science teachers in Enugu. The basic qualification for teachers of the junior secondary school as prescribed in the National policy on Education by the Federal Republic of Nigeria (2006) is a minimum of National certificate in Education (NCE) therefore; there is need for Basic Science specialist teachers in schools in Enugu to have at least this minimum qualification.

A number of different evaluation models have been suggested for the evaluation of educational programmes and processes, such as Provus's discrepancy model, secondary school evaluation model, Stufflebean's context, input, process and product model (CIPP), each of them generally emphasizes a particular aspect or aspects of the item or event to be evaluated but of all these models of evaluation, stufflebean's context, input, process and product evaluation model is deemed appropriate for use in this study. This is because of its comprehensive coverage as well as its appropriateness and relevance as a tool for effective evaluation of the school curriculum. Also the model would help to find out the deficiencies and discrepancies that exist during the implementation process of the Basic Science Curriculum. Moreover, whether the curriculum is actually being implemented in terms of its context, input, process and product (CIPP) and how it is being implemented at the junior secondary schools to provide feedback to relevant stakeholders.

For the successful implementation of basic science curriculum and programmes in Nigeria schools, it will undoubtedly begin with the question of teachers possessing the basic literacy skills and qualifications that can empower them to demonstrate any kind of competence in actual instruction. We cannot think of curriculum implementation without determining

whether the teachers are acquainted with the operational skills of the components. In like manner, competence will be needed for successful teaching and learning process. Basic science teachers therefore, require the needed knowledge and skills for implementation of the curriculum. It is believed, that the level of competences among teachers in Nigerian schools, is determined by a number of other factors. Such factors include qualification, age and gender (Michael, 2013) while discussing attributes that affect students' performance noted that teacher qualification is a factor of students' level of achievement in school subject. Longe, and Adedeji (2003) observed that students taught by qualified teachers perform better in examination than students taught by less-qualified teachers. Federal Republic of Nigeria (2004) stated that Nigeria Certificate in Education (NCE) is the minimum qualification for entry into the teaching profession. Consequently, any teacher with NCE is qualified to teach and so teachers with a minimum qualification of NCE are considered qualified for the purpose of this study. Okoli, and Ugbaja (2011) revealed that 80% of Basic Science teachers possessed Teachers Grade II Certificate (TC2)/NCE qualifications and 20% were Bachelor of Science Certificate (BSC) holders. Nwagbo (2008) asserted that the quality of any educational program in any country is a function of those who teach it and that a good curriculum as well as, well-stocked laboratory would still not give the desired result in the hands of incompetent/unqualified teachers. These conditions also constitute very serious problems to effective curriculum implementation in schools.Based on this, the researcher wants to find out the teachers' qualification in the implementation of basic science curriculum.

In addition, gender is a set of characteristics distinguishing between male and female, it refers to the socially constructed roles, behaviour, activities and attributes that a particular society considers appropriate for men and women. Traditionally, gender stereotype has over the

years continued to limit female's capabilities and constrain their ability to participate in all aspects of human endeavour. Gender issues themselves affect all aspects of the society to the extent that access of woman to certain profession/competencies in higher institution is constrained by these same sex-role stereotypes. It has been argued that this long-standing gender bias also reflects in performance levels. Gender was identified as a critical factor that affects teacher's attitudes towards teaching (Ogunleye and Babajide (2011). The researchers found out that females have lower scores on teaching competency than males. Michael (2013) also found that female teachers had less experience working with instructional materials than their male colleagues. Contrary to this, Nworgu, (2004) found out that women fill more comfortable teaching non science subjects like basic science with instructional materials than the male teachers. This shows that the influence of gender on teachers effectiveness in inconclusive. Hence, the need to find out how teacher's gender could influence the implementation of the basic science curriculum. Another factor that could ensure proper curriculum implementation is the instructional materials.

Therefore, against the forgoing, this research aims to evaluate the implementation of the current Basic Science Curriculum in use in Enugu State of Nigeria. This will be done using Stufflebeam's (2000) CIPP model considering such curriculum variables like the adequacy and appropriateness of the curriculum content, the qualification of the basic science teachers, the use of appropriate teaching methods, and teaching resources by the subject teachers. The study will be done with a view to improving students' achievement index in basic science which corresponds to the achievement of the curriculum content of basic science. An analysis of the curriculum variables in the study area will be objectively done in the study.

Statement of the Problem

The Basic Science Curriculum which was implemented few years ago does not seem to be producing the assumed result. The outcomes of the curriculum as perceived by many people have not impacted much owing to persistent rate of poor academic achievement of pupils and students in science related subjects especially in basic science. In recent times, the issue has become a great concern to the government, NERDC, curriculum specialist, teachers, parents and other relevant stakeholders in the education industry due to the underwhelming outcomes of the new curriculum. Suffice to state that, efforts made by the government, science educators and other relevant stakeholders towards improving this unfortunate trend have not yielded much result. These underwhelming outcomes according to many researchers could be as a result of poor implementation of the basic science curriculum. However, many believe that the actual implementation of the basic science curriculum kicked off with a lot of schools having no qualified basic science teachers, no laboratory, inadequate instructional materials, and scanty classrooms. Aside these, there are considerations by many studies that students perceive the subject as an abstract field and mentally tasking which can influence their achievement in the subject. Moreover, recently researches have revealed that teacher's competencies, instructional materials, school infrastructural facilities and finance have influence the outcomes of the implementation process. Hence, science educators and researchers have anchored most of their researches on factors responsible for this persisting and disappointing trend. Although many workshops and conferences have been held, the curriculum outcomes remain a great concern. Moreover, most researchers are of the opinion that evaluation should be a continuous exercise in order to determine the workability of any programme. In other words, to ascertain if the goals of

any educational programme is being achieved, there is need for empirical studies to find out if the implementation process was successful in achieving the expectation of the curriculum.

Hence, to the best of the researcher's knowledge, no known study have been carried out on the subject matter of this study, and it is the basis of the forgoing background that this present study is necessitated. Therefore, this current research work is informed to provide empirical evidence by evaluating the implementation of the Basic Science curriculum.

Purpose of the Study

The main purpose of this study is to evaluate the implementation of Basic Science Curriculum in junior secondary schools in Enugu Zone.

The study specifically intends to:

1. Determine the extent teachers align their teaching strategies to achieve the instructional objectives of Basic Science curriculum
2. Ascertain the availability of facilities for teaching Basic Science.
3. Ascertain the functionality of facilities for teaching Basic Science.
4. Assess the qualification of teachers teaching Basic Science in junior secondary schools in the zone.
5. Determine the extent of utilization of the facilities/instructional materials in implementing Basic Science curriculum.
6. Identify the methods used in teaching Basic Science in junior secondary schools.
7. Find out strategies for evaluating students in teaching Basic Science in junior secondary schools.
8. Determine the achievement of male and female students in basic science.
9. Examine the problems affecting the implementation of Basic Science curriculum.

Significance of the Study

The study has both theoretical and practical significance. Theoretically, Stufflebean's (2000) context, input, process and product (CIPP) model of evaluation which anchors in evaluating the various aspects of an educational programme, by assessing and determining the adequacy of the various aspects of it will be supported by the findings of this study. This is because, the findings will indicate the extent CIPP model of evaluation is comprehensive enough in evaluating the implementation of the Basic Science curriculum in terms of objectives, materials, methods, class activities and evaluation. Secondly, the social Meliorists, curriculum theory holds that education is a tool to reform society and create a positive change that will be confirmed by this study. Thirdly, John Dewey's curriculum theory which proposes that curriculum should ultimately produce students who would be able to deal effectively with the modern world will be supported by the findings of this study.

From the practical perspective, the outcome of the study will be of immense benefit to the following categories of people namely: the government, ministry of education, planners and developers of the curriculum, Universal Basic Education Commission (UBEC), curriculum implementers (teachers) and the students.

The government and ministry of education would utilize the findings of this study by becoming aware of what actually happens in the classroom in the name of Basic Science teaching in the State. It would equally enable them assess and judge their preparedness in the implementation and support for Basic Science Programme in the State. The findings would guide their future decisions, plans and preparations especially as they concern educational programmes.

The planners and developers of the Basic Science curriculum would from the findings of this study determine the extent to which the plan or program developed is actually been executed in the State. Based on the information, they would be able to make necessary provisions, amendments and or modifications, not only in the Basic Science curriculum but also in future science and non-science curricula.

The result of this study when made available to Universal Basic Education Commission UBEC can generate interest and need for UBEC to organize more workshops and seminars for Basic Science teachers in particular and other science teachers in general.

The findings of this study would also provide the teachers who are the implementers of Basic Science curriculum with self-evaluating criteria to enable them assess themselves with respect to Basic Science teaching. They would be able to compare what they actually do and what is expected of them. Supervisors as well as principals of schools would, from the findings of this study know what to look out for in Basic Science teaching.

The students would from the findings of this study develop interest in learning science thereby acquiring appropriate scientific knowledge and skills that will enable them to apply such understanding to every day events.

The findings of this study would also serve as a reference material for prospective researchers. Specifically, the procedures and techniques adopted in this study would guide future researchers on how to carry out a study of this nature on educational programmes and curriculum implementation.

Scope of the Study

The geographical scope of this study is Enugu educational zone of Enugu State in Nigeria. With regards to content, the study was restricted to educational qualification of the

teachers, extent of achievement of basic science objectives, availability, utilization of Basic Science facilities, teaching methods and modes of evaluation techniques employed by the teachers. The subjects for this study were made up of the basic science teachers and junior secondary school three (JSS 3) students, only their opinions about some of the issues under investigation were compared in the study.

Research Questions

In order to guide the study, the following research questions were formulated:

1. To what extent do teachers align their teaching strategies to achieve the instructional objectives of Basic Science curriculum?
2. Are there available facilities for teaching Basic Science in junior secondary schools?
3. Are the facilities for teaching Basic Science in junior secondary schools functional?
4. What are the educational qualifications of teachers implementing the Basic Science curriculum at junior secondary schools level?
5. To what extent do Basic Science teachers utilize the facilities and instructional materials in teaching Basic Science at junior secondary schools?
6. What methods do teachers adopt in teaching Basic Science in junior secondary schools?
7. What are the evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools?
8. What are the mean achievement score of male and female students in Basic Science?
9. What are the problems affecting the implementation of Basic Science curriculum?

Hypotheses

This null hypothesis was formulated and tested at the 0.05 level of significance in this study:

$H0_1$: There is no significant difference in the mean achievement score of male and female students in Basic Science?

CHAPTER TWO

LITERATURE REVIEW

In this chapter, literature relevant to the study has been reviewed under the following major headings.

Conceptual Framework

- Concept of Curriculum
- Curriculum Implementation
- Basic Science Programme
- Concept of Evaluation
- Models of Curriculum Evaluation

Theoretical Frame work

- Social Meliorists curriculum theory
- John Dewey's curriculum theory
- Social efficiency educators' curriculum theory.

Empirical Studies

- Studies on Evaluation
- Studies on Basic Science Curriculum
- Studies on Implementation Basic Science Curriculum
- Studies on Gender and Basic Science

Summary of Literature Review

Conceptual Framework

Concept of Curriculum

The word curriculum has been defined variously by different scholars depending on their interpretation of education and the various functions schools should perform to the individual and to the society at large. Curriculum is seen by Michael (2013) as a comprehensive documented plan developed with the intention that its implementation would lead to the achievements of some predetermined goals and objectives that guided its development. The goals and objectives are usually derived based on identified problems and or needs of individuals and the larger society. It specifies who should do what, with what and how, in order to achieve the objectives.

Curriculum is an organized framework that set out the content that the pupils are to learn, the process through which pupils achieve the set goals of the curriculum, what educators do to help pupils achieve these goals and the context in which teaching and learning occurs. Curriculum has been referred to as all the documented experiences that individual learners have in a programme of education whose purpose is to achieve some predetermined educational goals (Agusiobo, 2003). The educational goals are usually determined based on societal as well as individual needs (Agina, 2003). These concepts of curriculum entails that curriculum is preconceived intentions, or mapped out plans of all learning activities deliberately chosen and directed by the school which learners follow to reach predetermined goals.

Curriculum Implementation

Curriculum implementation is a significant phase in the curriculum process and this process requires due attention, Omiko (2011,) rightly pointed out that all curriculum development centres, agencies and schools wishing to carry out curriculum plans should device

strategies and resources in order to be able to encounter all possible oppositions and eventualities. Jeremaiah and Alamina (2007) noted that after the curriculum objectives, content and learning experiences have been selected, organized and the evaluation procedure determined, what follows is implementation process. Curriculum implementation process entails interactions between the curriculum plan, the teacher, the learner and the learning environment, (Agina, 2003). During the implementation process, the human, environmental and material factors have to be considered to ensure effective implementation. According to Dike (2004) Curriculum implementation is concerned with what happens in the classroom. It is the interaction of the teacher, the learner and the curriculum document and the educational environment. He is of the view, that a planned curriculum contains realizable educational goals but the extent of actualization of the set goals depends on the effectiveness of the implementation process.

Curriculum implementation is the process of putting the various decisions made in the field trial stage of curriculum development process into practice (Jeremaiah, 2004). He noted that if other stages of the curriculum development process can be executed without active participation or involvement of the school, the implementation stage is largely within the province of the school to accomplish. He is of the view that implementation is involved with the open use of the curriculum document throughout the entire school system. According to Dike (2004), curriculum implementation is the actual engagement of learners with curriculum document (i.e. planned learning process) that will bring about the desired behavioural change in the learner. Considering the roles of the teacher in curriculum implementation, Michael (2013) has described the teacher as a curriculum implementer, motivator of learning, facilitator of learning and a guide for learning as follows:

Teacher as curriculum implementer: The teacher takes up the curriculum at its global level and breaks it down to the specific operational and functional classroom level. This is ultimately achieved by deriving specific performance objectives from the general objectives. These objectives are very relevant to the implementation process of the curriculum because they give direction to education, enabling the teacher to select learning experiences and content and then consider how best to organize them for effective result to be obtained. Then he employs appropriate teaching strategies and methods, and also evaluates the success or otherwise of his efforts.

Teacher as a motivator of learning: The teacher motivates the learners to learn. A careful and beautiful plan for curriculum implementation may be made and a well-designed teaching method adopted, but they may all fail in producing the desired change in behavior in the learner because the learner is not motivated to learn. According to Micheal (2013), motivation refers to those factors which increase and decrease the vigor of individual activities. The teacher can motivate the learner by employing rewards and reinforcement, teaching from known to unknown, knowing the learners progress, encouraging healthy competitions and ensuring learners active participation.

Teacher as a facilitator of learning: The teacher facilitates curriculum implementation by providing learning materials, recognizing individual differences, employing appropriate teaching strategies and by having well planned and executed instructional procedures.

Teacher as a guide for learning: The teacher provides guide (sense of direction) to ensure that the learners learning efforts and activities are not misdirected (Michael, 2013)

To ensure effective curriculum implementation, Nwosu and Ibe,(2012) outlined Several Qualities of a teacher as:

- Mastering of the subject matter
- Educational competency of the teacher (ie Professional competency)
- Liking of the subject and liking of the students. The teacher as the principal actor in the curriculum implementation process should possess the above qualities. Curriculum implementation process is the actual classroom teaching and that is why teachers are key curriculum implementers while the learners are the curriculum recipients (Braide, 2006). After due implementation stage, evaluation helps to determine the extent in which the objectives of the curriculum have been achieved. Curriculum evaluation showcases the exact picture of the curriculum implementation.

Importance of Curriculum Implementation

The ultimate realization of any set of aims and objectives for education depends on the teacher and the implementation process. The major importance of curriculum implementation is for the achievement of set goals and objectives of the educational programme. Through effective curriculum implementation process in the classroom, the success of the programme is guaranteed. The success of such educational programme would be of great benefits to the government, ministry of education, curriculum planners and developers, curriculum implementers and the society at large. The ability to deliver the lesson-properly depends to a great extent on the skills and competencies of the teacher towards implementation. Effective learning results from effective teaching. Learning will result from teaching and students achievement is the key word to justify this, (Maduewesi, 2005). Teachers must be accountable for what goes on in education. It is important to note that through implementation process, the teacher is able to determine and give account of the extent to which lesson objectives have been attained. Through the implementation process, the teacher conducts a performance assessment at

the end of lessons or units of lessons. Through curriculum implementation process the strength and weakness of the programme are determined. In general, there are many benefits of curriculum implementation. However, four main benefits are identified as follows:

- It enhances the achievement of set goals of the programme.
- It helps in determining the difficulties involved in such programme.
- It is used to determine the educational effectiveness of a curriculum, instructional materials and procedures and organizational arrangement of the programme.
- Assessment of educational progress of a programme as well as help to understand educational problems and develop sound policy in education (Ofoegbu, (2003)

Process of Curriculum Implementation

The teacher is a prime factor of consideration in the curriculum implementation process. The implementation in question is among the curriculum concepts known. When a planned curriculum is not implemented, it is equivalent to no planning, signifying that the planning would be seen as a wasted effort, (Iloputaife, Maduewesi and Igbo, 2010). The presentation, co-ordination and evaluation of learning opportunities are carried out by the teacher who takes the overall decision on the implementation activities. The teacher translates the intended curriculum into active curriculum. This, he does through direct and appropriate use of the syllabus, that is a component of the curriculum. Syllabus is the outline of topics or learning experience to be covered in each subject year by year, for the period the learner is in school. It reflects the nature of the examination to be taken by the students at the end of the course of study. This syllabus is broken down into smaller topic and arranged sequentially to be taught yearly, termly and weekly. This is referred to as scheme of work. From this scheme of work, the teacher further splits the topics which he uses to build the unit plan from which he plans his daily lesson note / plan. A

lesson plan is an orderly arrangement of components of lesson on paper. These components are topic, the specific objectives, entry behavior, instructional procedure, teachers and students performance activities, then evaluation of the intended learning outcomes. The actual implementation process takes place in the classroom where the acquisition of knowledge, attitude and skills by the learners are made possible by the teacher. During instruction, classroom activities and interactions are initiated by the teacher and their effectiveness are largely dependent on the teacher's competence. To produce learning, the teacher directs and guides the learners' activities for learning to be effective. To enhance this, Iloputaife, Maduewesi and Igbo (2010) observed that the teacher must be prepared in such a way that he would be able to present a pre-digest, planned, systematic, sequential, controlled content and methodology. This justifies that for quality education to be realized, the teacher should endeavor to manage learning materials effectively for maximum compliance from the learners during instruction. Also during the implementation process, the teacher directs as well as judges learning activities. This gives him feedback to evaluate frequently the learning outcomes in relation to the learners' needs which reach out to the wider society.

Factors that affect Curriculum Implementation

It is sad to note that a good curriculum plan can be marred at the implementation stage due to challenges and some prevailing circumstances at the time of operation beyond immediate control thus jeopardizing the efforts expended in the planning. These factors include among others:

- Teacher factor
- Learners factor
- Teaching / learning factor
- Gender factor

- Instructional material factor
- Teachers / student ratio factor
- Utilization of Information and Communication Technology (ICT) service factor
- Environmental /Infrastructural facilities factor
- Inadequate funding. (Iloputeife, Maduewesi and Igbo, 2010: 450-458)

The Teacher Factor

Teacher factor involves teachers' qualification, training, readiness or commitment, the teachers' capability in utilizing the necessary teaching skill as well as his methods of teaching. According to Fafunwa (2004)) stated that no nation can rise above the knowledge of its teachers. The issue of teachers being the chief implementer of curriculum must be treated with utmost care and great importance no matter how adequate the objectives and content of any educational curriculum may be, its implementation is very crucial to its success, hence the pedagogy, quality, quantity, readiness or commitment of the teachers as well as their capabilities in utilizing the necessary teaching skill are very vital. In another view, Bruner (1960) in Iloputeife, Maduewesi and Igbo (2010) quote

> *"A curriculum is for teacher s than it is for pupils. If it cannot change, move, perturb and inform teachers, it will have no effect on those whom they teach. It must be first and foremost a curriculum for teachers. If it had any effect on pupils, it will have it by virtue of having had an effect on teacher"*

The teacher occupies a central position with the job of setting up learning opportunities providing learning experiences and utilizing relevant teaching skills and appropriate methods and media to bring learners in a face to face encounter with learning activities that will enable them acquire the desired knowledge, skills and values. A situation where teachers are not properly

trained, lacking good knowledge of the content and skills required, a very good curriculum plan will turn out to be a damaged document with all efforts dashed. It is a big challenge to train teachers and support staffs to meet the challenges they are likely to face in the classroom. The effect of teachers' strike action due to non –payment of salaries, grants, allowances and even non- promotion of teachers have much to tell on effective curriculum implementation.

Learners Factor

The learners who are the future leaders are the recipients or the final consumers of whatever food cooked in the name of curriculum plan. It is indeed for the good of the learners irrespective of the age and level of education that the curriculum is developed and implemented for the general growth of the society. Effective curriculum implementation in schools has much to contend with about the learner, viz, the learners factor entails the learner interests, readiness to learn, his mental and physical age, his capabilities, previous knowledge or his entry points.

- The learners' age and entry behavior i.e. his physical and mental age, his basic pre-requisite knowledge, skill and general understanding which he brings to the class has much influence, positive or negative on effective curriculum implementation.
- The learners' interest and readiness is yet another dimension. What exactly are their interests or what are they really ready to do or become? Are they enthusiastic about reading and writing in the development of the skills? These are challenges faced by both curriculum planners and curriculum implementers to give a serious thought of how to curb as to make teaching and learning in school a reality.

Teaching / Learning Factors:

This involves the teaching and learning styles adopted by the teacher in the curriculum implementation process. Didi and Wonu(2010), described instruction as a set of event, external to the learner which are designed to support internal processes of learning thus making possible for a learner to proceed from "where he is" to the achievement of the capabilities specified in the terminal performance objective. Our teaching and learning style which is still "talk chalk" does not cover all the learning styles categories but only five (intuitive, verbal, deductive, reflective and sequential) and yet not all teachers are able to use them. Teachers rather present their teaching in abstraction that understanding becomes very difficult. A method devoid of innovative teaching approach is mechanistic, non –creative, not- brain tasking and thus renders our creative ingenuity and potentiality dormant. This indeed is a big challenge to effective curriculum implementation especially in the face of the present day discoveries and changes resulting from knowledge explosion and implosion (NTI, 2011).

Gender Factor

Gender issues in curriculum implementation is quite complex. Having heard and seen much about it in the wide world and Nigeria in Particular as it affects the education of females, Akinsinde,(2000), highlighted some gender related problems in curriculum implementation as follows:

- Discriminating attitude of some parents
- Attitude of some teachers
- Gender stereotyping
- Male / female pupils school enrollment
- Cultural and religious factors

- Sexual harassment
- Girls' high dropout rates.

Some parents still prefer the education of male children to that of female thus provide more learning materials for the male than the female. This undoubtedly creates a kind of psychological and emotional battering which has an untold negative effect on the female child's performance in the classroom activities.

Attitude of Teachers: the attitude of some teachers is nothing to write home about as teachers' impression towards the female is negative in most cases which give rise to gender biases. The classroom being a complex environment where a lot of interaction occurs which perhaps leads to the development of self –esteem and self-conditioning. Much prejudice and stereotyping in the classroom breed gender biases as teachers give more attention to male learners and making them to dominate in the use of science equipment, technology, computer etc.

Cultural and Religious Factors: cultural and religious biases are yet another serious gender issue. Some cultural belief breeds segregation between male and female learners in the classroom, thus preventing them to learn from each other as to enhance their abilities. This is very much pronounced in the northern part of Nigeria where also female learners at certain age could be forced out of school to go into marriage based on cultural belief. All these are detrimental to the female learners who are invariably deprived of good education as spelt out in the curriculum.

Sexual Harassment: The female learners as have been observed are also exposed or prone to sexual harassment either by their male teachers or their male class-mates. This may result to emotional stress, and fear thus leading to low class performance achievement. Sometimes unwanted pregnancy occurs which of course leads to final withdrawal from school especially at

the primary and secondary school levels which are the bedrock or the basic foundation levels for educational growth.

Instructional Materials Factors: The classroom being made up of learners of different psychological, physiological, mental and social background, it becomes imperative that the teacher whose major task is to achieve meaningful and effective communication with the learners, needs some vital aids to meet up with this great demanding task of achieving educational objectives hence the availability and effective utilization of educational media / materials is of great concern (Omiko, 2012). The teacher is therefore expected to employ different media in presenting learning experiences, maximizing his sense of creativity and improvisation to make available suitable and appropriate teaching equipment to ameliorate teaching/learning. Since different person's senses and perceptions, individual learners' differences must be catered for with different materials. Many schools are without the relevant teaching materials and still, many teachers are ignorant of the ability to create and even to manipulate the few ones available like microscope, petridishes, bursen burner etc, teachers lack the skill for effective utilization in the teaching and learning process.

Teacher/Pupils Ratio Factor: This however, has posed a serious problem of effective curriculum implementation as a visit to Nigeria schools will reveal an over populated classroom with just few teachers attending to the great multitude of learners in both government and private schools at all levels, pre-primary, post primary schools and even the tertiary institutions (Iloputeife, Maduewesi and Igbo 2010). Curriculum implementation at junior secondary education level as stipulated by the National Policy on Education (2004) for effective class control and teaching to take place there should be teacher-pupils ratio of 1:40 (Iloputeife, Maduewesi and Igbo 2010).

With the teacher pupil ratio of 1:50 or more at the junior secondary level of education, the teacher's work becomes quite enormous hence the possibility of proper curriculum implementation becomes very lean.

Utilization of Information and Communication Technology (ICT) Service Factor:

Information Communication Technology worldwide has been noted for its tremendous and immense contribution towards the advancement of knowledge and skills hence Mailer (2011), called for an urgent integration of ICT into education and its curriculum implementation process. The epileptic and non-reliable electric power supply in Nigeria does not in any form make for effective utilization of ICT equipment in schools since not all schools can afford even the purchase of a computer how much more buying of private generator. The non –availability of computers in schools, according to Tuoyo (2007) creates more social illiteracy and economic denial of the rights of children especially the exceptional children, to participate in the school system and in the society at large" all these coupled with the acute shortage of trained personnel in application of software, operating system, network administration and even the technicians to service and maintain computer facilities. He also noted that the limited access to internet go miles to impede the use of ICT for effective and efficient implementation of curriculum in Nigerian schools; primary and post –primary schools which indeed are basic foundation of education. ICT being a novel in Nigeria educational system still has the problem of how teachers can utilize ICT and its tools in the teaching/ learning process.

Environmental/Infrastructural Facilities Factors: A conducive well ventilated and good classroom structures make for good and meaningful teaching and learning, but where you have dilapidated buildings, partitioned classrooms as in many government schools where palm fronts are used as ceiling board and zinc, effective and efficient implementation of the curriculum will

be a mirage. It may not be authentically carried out, especially in places where security is not guaranteed. Some schools do not have enough seats and desks as observed during teaching practice supervision where pupils were all seated on bare floor with their writing materials and some lying on their stomach, (Iloputeife, Maduewesi and Igbo, 2010). This could be regarded as child and education abuse of the highest order and can never make for effective curriculum implementation. Inadequate library facilities and ill equipped science laboratories as experienced in some schools has much to tell on the issue of effective curriculum implementation in Nigerian schools.

Funding Factor: fund means money in various forms, adequate funding helps a lot in effective curriculum implementation at any educational level. With adequate funding, recruitment of qualified teachers, availability of instructional materials and suitable facilities are provided for effective curriculum implementation (Nakpodia, 2011). Secondary education has been experiencing the problem of inadequate funding since its inception in Nigeria. This problem results in poor management of policies and no incentives for the teachers.

An Overview of the Basic Science Programme

The National Policy on Education, (NPE) (2004) recognizes education as instrument per excellence for individual and national development. In Nigeria, as it is in the world over, education is an inalienable right of every child. Through education, every child is expected to acquire desirable and functional knowledge, develop appropriate skills both intellectual and physical as well as positive attitude and values necessary to live successfully and become a useful member of the society, Mustapha, (2012). The overall purpose of basic education is to produce a literate society in which the individuals can apply their literacy in terms of knowledge, skills and values to enhance their survival. Nigeria, having realized the effectiveness of

education as a powerful instrument for national progress and development adjusted her educational philosophy and methodology to match the ideas and challenges of the modern society (National Policy on Education 1981, revised 2004).

The Federal Government in 2006, Launched a new curriculum known as the universal Basic Education (UBE) for Primary and Junior Secondary Schools. Universal Basic Education is a free and Compulsory education for all Nigeria Children from the age of 6 to 15 years and Literacy training for adults. It was formally launched on 29th September 1999 in Sokoto by the former president Olusegun Obasanjo in fulfillment of the governments' signatory to a number of international declarations on education. This includes the Jomtien Declaration of Frame work for Action on Basic Education, Hamza, (2007). The UBE act was passed into law in the year 2004 (Tahir, 2005): The new curriculum is said to address amongst other things issues of value re-orientation, poverty eradication, critical thinking, entrepreneurship and life skills. The Nigerian Educational Research and Developments Council (NERDC) is responsible for the compilation and completion of curriculum used as a guide to qualitative education in both primary and secondary schools. The National Council on Education (NCE) has already approved the curriculum and plans are in high gear to produce the curriculum in mass for immediate use in schools. The executive secretary of NERDC, Professor Godswill Obioma while presenting the new curriculum to other stakeholders in the education sector at the Educational Resource Centre in Abuja said that the new curriculum seeks to correct the abnormalities of the former one which was lacking in the area of human capacity development. According to professor Obioma, the new curriculum allows and gives opportunity for the students to be taught skills and educate them on the need to appreciate their culture. He added that if teachers adequately implement the

curriculum, the students would be able to interact very well which would sensitize the environment and promote peace and developments in the country (Obioma, 2007).

A feature of the new curriculum is the phasing out of primary science and integrated science for what is known as Basic Science. This, according to Obioma (2007) prepares a child adequately for higher studies by providing a solid foundation on which to build upon.

Historically, the Nigerian Junior Secondary School Science curriculum was developed in 1980 by the panel of experts from several arms of educational system. It derives its objective, philosophy and direction from the national policy on education (1978) which includes:

- To equip students to live effectively in our modern age of science.
- To raise a generation of people who can think for themselves, respect the views and feelings of others, respect the dignity of labour and appreciate these values specified under our broad national aims and live as good citizens (FRN 2004). Implicit in these objectives is the need to develop and implement functional, comprehensive and flexible science curricula at all levels of our educational system. This belief and genius gave birth to the curriculum that is being evaluated in this study.

The 9 year Basic Science Curriculum according to Adeniyi (2007) is the product of re-alignment and restructuring of the revised curricula for primary science and junior secondary school integrated science. In selecting the contents, three major issues shaping the development of nations worldwide and influencing the world of knowledge today were identified.

These are globalization, information and communication technology (ICT) and entrepreneurship education. The desire of Nigeria to be identified with contemporary

development worldwide, called for the infusion of relevant contents of four non-school curriculum innovations in the areas of:

- Environmental Education (EE)
- Drug Abuse Education (DAE)
- Population and Family Life Education (POP/FLE)
- Sexually Transmitted infection (STI) including HIV/ AIDS. Infusion of content occurred in every class from basic 1-9. The overall objectives of the new Basic Science curriculum outlined by Adeniyi (2007) are to enable the learners to:
- Develop interest in science.
- Acquire basic skills in science.
- Apply their scientific knowledge and skills to meet societal needs,
- Take advantage of the numerous career opportunities offered by Science and
- Become prepared for further studies in science.

In order to achieve a holistic presentation of science contents to learners, the thematic approach to content organization was adopted. Consequently, four themes were used to cover knowledge, skills and attitudinal requirements. These are:

- You and Enviroment
- Living and Non- living things
- You and technology
- You and Energy

At the Upper Basic level however, theme “3” You and Technology was changed to “Science and Development.” The Topics under each theme were sequenced in spiral form beginning with the simple to the complex across the 9-year of Basic Education in order to sustain the interest of

learners and promote meaningful learning. The use of guided inquiry method of teaching and learning is implied in the activities prescribed under each topic in order to promote learning by doing and skills development. The theme “Science and Development” was added to expose students to development in science alongside skills that will enable them to face challenges, make informed decisions, develop survival strategies and learn to live effectively within the global community.

The new UBE Basic Science curriculum can be said to be carefully planned, well written and documented having all it entails to bring socio- economic development through the achievement of the Millennium Development Goals (MDGs) and the critical elements of National Economic Empowerment and Development Strategies (NEEDS). But the workability of any curriculum depends on its effective delivery which involves the learner, the teacher, the resources, the methods of teaching and evaluation as well as the physical and psychological environment which must be adequate and conducive for learning to take place.

In conclusion, the new UBE Basic Science curriculum has all it takes to provide pupils with basic skills in science that will enable them live effectively within the global community.

Furthermore, it will help in grooming pupils that will develop interest in learning science in the senior secondary classes and beyond, thereby, producing powerful scientists for the nation. The question is has the curriculum been effectively implemented?

Concept of Evaluation

Evaluation has been defined in various ways by different scholars and educationists. To evaluate is to find out information about something in order to determine or decide on the value of that thing. Adejo, (2006) views evaluation as a method of acquiring and processing the evidence needed to improve the students learning and teaching, as an aid to clarify the

significance goals and objectives of education and as a process for determining the extent to which students are developing in these desired ways as a system of quality control which may be determined at each step in teaching / learning process whether the process is effective or not, what changes must be made to ensure its effectiveness before it is too late. Finally he views evaluation as a tool in educational practice for ascertaining whether alternative procedures are equally effective or not in achieving a set of educational ends. Thus it is important to note that evaluation as a process is continuous, dynamic, systematic and cumulative.

Olaitan and Ali (2000) described evaluation as critical examination of instruction, project, programme or things irrespective of its goals. Scriven considers evaluation as an alternative process of acquiring information about an institution and assess the programme as a whole in order to determine its effectiveness. Scriven in his efforts to clarify the role of the evaluator insists that comparison is an important component of all types of evaluation and that the evaluator must attend to relate outcomes across many dimensions, even if the two circulars are designed for different purposes. More importantly, he advances the proposition that evaluator cannot avoid many value judgment and that statistical indicators of programme effectiveness must be considered in a judgment frame work. Scriven stresses on the importance of evaluation in making valued judgment, role of evaluators and the need for statistical analysis while embarking on educational evaluation.

Wheeler (2000), in Michael (2013) in a similar view believed that evaluation is essentially a process of comparing programme performance and desired programme standard to determined if there are discrepancies between the two. Any discrepancy information obtained is utilized in the improvement of the programme which adds to the fact that evaluation process

serves as a feedback device. Provus (2000), summarized his view by identifying three major steps in evaluation as:

- definition of programme standard
- determining whether discrepancy exists between some aspects of the programme and performance standard and
- Using discrepancy information to identify the weakness of the programme.

Amadi,(2004) argued that what is evaluation may be a set of instructional activities of a single school, or the educational experiences of a single pupil but generally ranges from evaluating the performance of a single child in a course through the evaluation of specific instructional materials, methods, activities and techniques to the evaluation of the entire curriculum or programme. The primary concern of evaluation is to be able to take appropriate decision about the curriculum or programme. In school situation, decision may border on:

- whether not to promote the learner
- change the method of teaching
- review the curriculum
- report to parents about the performance of their wards or children and change or supplement instructional facilities considering the type of decision that can be made on evaluation. Ofoegbu,(2003)identified the following decisions:
- course improvement decision such as deciding whether instructional materials and methods are satisfactory and where change is needed.

- decision about the individual such as identifying the needs of the pupils for the sake of planning his instruction, Judging pupils merits for purposes of selecting and grouping, acquainting the pupils with his own progress and deficiencies.
- administrative regulation, judging how good the school system is and how good individual teachers are.

Anwukah (2001) focuses on logical problems involved in comparing the outcomes of a programme with the goals of the programme. According to him evaluation is a process by which the strength and weakness of curriculum process and implementation are identified. He further defined curriculum evaluation as "Evaluation that seeks to determine the adequacy of the objectives being pursued by the school, the adequacy of the content as subject matter offered or taught in schools, the relevance or functionality of the learning activities or experiences to which learners are exposed to in schools, the appropriateness of the organizational structure of the content and learning experiences offered to learners, the suitability of the instructional methodologies adopted in the Schools and the ability of the procedures or programmes used in evaluating learners progress towards the objective'.

This definition seems to be comprehensive because it constitutes students level of achievement of objectives, teachers effectiveness, the effectiveness of instructional materials used as well as the overall effectiveness of the curriculum when fully developed. Nwana (2007) supported that "no matter how efficient a teacher is, how intelligent the students are and how adequate the audio visual materials are, if no provision is made for some evaluation of programme, the teaching effort may be completely invalidated." This implies that no teaching is complete without evaluation

because the essence of evaluation is to find out how well the teacher has done his job. Anwukah (2001) stated the following as characteristics of evaluation, these include; Orientation to goals, comprehensiveness, continuity and appropriateness.

It is of the view that orientation goal is a characteristics that is related to evaluation. Without setting a goal, one cannot tell much about the nature and direction of his progress or achievement. Consistency of both evaluation devices and learning experiences with an established list of goals is a necessity of good educational planning that most often seems to be ignored.

- Comprehensiveness is another characteristic of effective evaluation. Evaluation must be as broad as the goals often to which it relates. However for the evaluation to be comprehensive, it must make use of numerous and varied sources.
- Continuity is another characteristic of good evaluation. It is often assumed that evaluation rightly comes last in any educational enterprise. Actually, it should be frequent and recurrent, continual, if not continuous, evaluation should be built in at almost every stage of every enterprise and it should be accomplished with imagination, skills and appropriateness. The element of appropriateness in evaluation further suggests a need for two additional and related characteristics of evaluation, diagnostic worth of evaluation and the validity of evaluation. The instrument used in evaluation must be capable of diagnosing specific aspects of the educational situation, such instrument should be valid and reliable. Validity and reliability when applied to curriculum consists of ability to measure the effects of an educational experience accurately on repeated occasions.

Considering the aim and objectives of education as bringing about certain desirable changes in the learners behavior, which the curriculum is considered as an instrument used by the school

to achieve these set objectives, it becomes imperative for curriculum implementation process to be evaluated from time to time. Doll (1974) in Anwukah (2001) Stated that the evaluation of curriculum implementation should be conducted at regular interval as this would determine what was / is going on in the classroom and the extent to which the goals of the curriculum were achieved. Agina (2003) defined evaluation as systematic process of determining whether a programme has been worthwhile in terms of delivering what was intended and expected of it. He sees evaluation as a process intended to fulfill a number of functions namely;

1. Measure of programme outcomes and impact of such programme. However, a good evaluation will give answer to these question.

- did the programme achieve its stated objectives?
- did it reach its intended audience?
- was the size of the outcome as expected?
- did the programme have unexpected or unintended consequences?

2. Evaluation should inform future programme planners and designers on the following:
    - what are the strength and weakness of a given approach?
    - what implementation problems have emerged in the programme?
    - are measurement criteria appropriate and adequate for the programme?
    - are confounding influences affecting outcomes? eg interventions that may have been aimed at the same issue or target group.
    - have new concepts or ideas emerged and can they be tested?
3. Evaluation provides important internal lesson for those conducting the programme. For example, evaluation can offer feedback on whether the expenditure of financial and human resources required for the programme was justifiable.

- were funds used properly?
- is there a return on investment?

4. Evaluation ensures transparency and accountability in a programme.
5. Evaluation provides broader lessons about good practices.
    - what lessons can be learned from this approach?
    - are there lessons about policy options?
    - do the results support existing evidence of a programme?

Categories of Evaluation

Agina (2003) Categorized evaluation into three groups namely:

- Process Based Evaluation
- Outcome Based Evaluation
- Impact Based Evaluation

The choice of the most appropriate type of evaluation is guided by several factors, including the availability of resources and whether the need of such evaluation is for inter or external purposes.

Process Based Evaluation: Process based evaluation is useful in assessing how an intervention is being implemented or whether it is producing the necessary result. Process assessment is likely to be useful internally, whereas the focus on outcome and impact can help justify the intervention both internally and externally. Which ever evaluation model is used, data need to be collected in a systematic manner. Data may be quantitative, (descriptive e.g counting the number of drink driving facilities or the percentage awareness of risk) or qualitative (measurable and definable in absolute numerical terms, e.g recording subjective views on whether a program has changed perception). Successful evaluation often blends with quantitative and qualitative data collection, since there is usually more than one means to answer any given question, (Amadi, 2004). Process

based evaluation is used to understand how a programme works and delivers its results, (Braide, 2006). They assess the activities that are being implemented and the materials that are used. Process based evaluation are intended to answer some of the following questions:

- What is required to deliver the services in terms of resources, products and services?
- How individuals implementing the program are trained?
- How are participants selected and recruited for the program?
- What are considered as the program strength and weakness?
- What is the feedback from participants and partners about the implementation of the program?

Outcome Based Evaluation

Outcome based evaluation is used to measure any change immediately after program implementation and to establish that these changes have been occurred in response to the program being evaluated, Jeremiah,(2007). Outcome based evaluation focuses on the following questions:

- Which outcome is being measured (e.g behavior change or change in knowledge or awareness and why)?
- How will these outcomes be measured specifically to be considered successful or failure?

Impact Based Evaluation

Impact based evaluation is the most complex and difficult to carry out. It examines the long term effect of an intervention or program, Agina (2003). The most successful type of impact based evaluation tracks effects over extended period of time, rather than simply examining conditions immediately “before” and “after” the program has been implemented.

Evaluation is concerned with determining the extent to which educational objectives are actually being realized by the program of curriculum. Stuffle beam et al (2000) in Amadi (2004). They see evaluation as the systematic collection of evidence to determine whether in fact certain changes are taking place in the learners as well as to determine the degree of change in individual student. It stresses the effectiveness of the program in bringing about desired behavior change in the learner which means questioning the merits of the program. It also focuses on the process of getting the evidence on learners performance. According to Amadi (2004), evaluation is the structural interpretation and giving of meaning to predicted or actual impact of proposals or results. It looks at original objectives, what is either predicted or what was accomplished and how it was accomplished. Evaluation has been defined as a systematic, rigorous and material application of scientific methods to assess the design, implementation, improvement and outcome of a program. It is a resource- intensive process, frequently requiring resources, such as evaluators' expertise, labour, time and a sizeable budget, Ajaja [2005].

Curriculum Evaluation

Curriculum evacuation is concerned with the total evaluation of the entire curriculum process beginning with the objectives, content learning activities and the organization, Agina (2003). It is also concerned with the critical examination of the appropriateness, relevance, adequacy, suitability and functionality of the various elements of the curriculum. Therefore, it can be seen as a process of obtaining data or information about the programme for the purpose of determining the success or otherwise, thereby making decisions about whether to maintain the features of the programme or suggest a more effective alternative. In curriculum, evaluation is viewed as a process of systematic collection of relevant data or information in form of facts, figures, opinions for the purpose of assessing the worth or value of a given programme, project,

learning activities or situations, Agina (2003). This means that before we arrive at any meaningful decision making, we must have to be equipped with relevant facts, information and opinions. Evaluation is not based merely on learners in the classroom alone, we also evaluate school facilities, teaching /learning facilities, teaching procedures and other educational activities. The primary concern of evaluation is to be able to take appropriate decision on whatever we want to do. In the school situation, decision may border on:

- Whether or not to promote the learner
- Whether to change method of teaching
- Review the curriculum
- Report to parents on the performance of the children
- Change or supplement the teaching / learning facilities.

Curriculum evaluation addresses the question of what a curriculum is, what it does and how well it does it, Amadi (2004). Curriculum evaluation which runs through the entire curriculum design process enables planners to define the environment, the needs to be met and the opportunities available. Curriculum evaluation also provides feedback to those who implement the program, since it describes what actually is taking place during the implementation process.

Purpose and Process of Evaluation

Purpose of Evaluation

Evaluation serves different purposes to different scholars, considering the perspective from which one views the purpose. In considering the different purposes by different scholars, Braide (2006) grouped purposes of evaluation as follows:

- Decision –making / judgmental purpose
- Course improvement purpose

- Accountability of objective purpose
- Measurement / assessment purpose.

Decision –making / Judgmental Purpose

Braide (2006) sees the purpose of evaluation to involve making value judgment, giving guidance, making decision and accountability. He stated that educational evaluation is a process of delineating, obtaining and providing useful information for judging decision alternatives. Cronbach (2000) in a similar view on the purpose of evaluation Stated that evaluation is the collection and use of information to make decisions about education programmes. Nwankwoala (2009) sees evaluation as the process of ascertaining the decision areas of concern, selecting appropriate information, collecting and analyzing information in order to report summary data useful to decision- makers in selecting among alternatives. He sees evaluation as a process of decision making.

Course Improvement Purpose

Nwankwoala (2009) sees evaluation as the systematic collection of evidence to determine whether certain changes are taking place in the learner as well as to determine the amount or degree of change in individual student. Considering the purpose of evaluation, this definition stresses the effectiveness of the goal in bringing about desired behavior changes in the pupils. He added that evaluation is a systematic process determining the extent to which instructional objectives are achieved by pupils. Nworgu (2006) Stated that when evaluation is carried out in the service of course improvement, the chief aim is to ascertain what effect the course has, that is, what changes it produces in pupils.

Accountability of Objective Purpose

Braide (2006) sees the purpose of evaluation as that of accountability of objectives. He is of the view that evaluation is a systematic process of determining the extent to which instructional objectives are achieved in pupils. Nwankwoala (2009) views evaluation as objective based process which relates to the outcome of the pre-specified objectives, allowing judgment to be made about the level of attainment of set goals. Evaluation is considered to be constituents since it provides an accurate account of results in a program.

Measurement / Assessment Purpose

Amadi (2004) defines evaluation as a measurement of an intended action which the goals are forwarded for value judgment. According to the views of Jeremaiah (2004) on measurement in evaluation, evaluation has to do with passing value judgment about the worth of an entity. Evaluation in education has to do with assessment of educational objectives at different levels and knowing the extent by which instructional objectives are achieved. This aspect of measurement

Is very important to the curriculum experts in the sense that the curriculum planning process from need identification to implementation is saddled with series of evaluation process. Evaluation serves as a feedback to the curriculum planners, teachers, learners and the society. Jeremaiah (2004) Stated that evaluation measures the extent by which programs have been achieved in line with demands of the society.

Types of Evaluation

The type of evaluation is dependent on the purpose for which that exercise is designed. As a result, there is the pre-course evaluation called diagnostic evaluation whose purpose is to diagnose the present or prevailing situation or condition of the learner before we can prescribe

appropriate remedy where necessary Agina (2003). Analyzing the situation of the learner, the school and facilities is a kind of diagnostic evaluation. According to Amadi (2004) there are two major types of evaluation in curriculum planning known as formative and summative evaluation. The third type of evaluation is known as goal free evaluation.

Diagnostic Evaluation

This is related to analyzing or assessing the prevailing situation before designing a program or teaching the students. It is necessary that adequate information about the learners, course or school be gathered before handling the learner or situation, Agina (2003). The data gathered will assist in knowing the strength and weakness of the learners. It will equally assist the planners to either adapt to or improve on the situation of teaching / learning process. In addition, such an exercise will help to guide the formulation of new objectives, adopt teaching / learning materials and content to suite the developmental level of the learners: at the end, it will help to know whether the situation has improved or not.

Formative Evaluation

Formative evaluation takes place when the program is on course and is used to monitor the progress of the program, Agina (2003). The main purpose of this type of evaluation is to ensure that the program will bring about the desired result. In the classroom situation, it is a kind of continuously assessing the learners so as to find out strength and weaknesses of the learners, difficulties they encounter how best they can be assisted and the rate at which progress is being made in classroom. According to Amadi, (2004), formative evaluation is the periodic and continuous assessment of the curriculum planning process to ascertain if the plans are adequate. The process –oriented evaluation occurred at each stage of the curriculum planning process. This permits on- the-spot modification and correction of the programme at the moment the problems

are identified. Thus formative evaluation is carried out to modify the program as it unfolds rather than leave errors to be detected at the end of the program. This type of evaluation starts from the beginning of the program and goes through out the duration of the project. Referred to sometimes as continuous assessment, it is corrective and preventive in nature. According to Jeremaiah and Alamina (2007), formative evaluation is used for monitoring curriculum development at it's various stages. It provides continuous feedback to the curriculum development team on:

- Information about identified flaws
- Information that will enable modification where necessary on various aspects of the curriculum. Skate (1969) in Jeremaiah and Alamina (2007) points out an important feature of formative evaluation, that one must take into consideration the divergent points of view of those involved in the program. The merit of the program is also a major concern of Skate. His view is that

> *As evaluators, we should make a record of all the following: what the author or teacher or school had intended to do, what is provided in the environment, the transaction between teachers and learners, the students progress, the side effects and last but most important, the merits and short comings seen by persons from divergent viewpoints (Skate 1969).*

Summative Evaluation

Summative evaluation is a product –oriented appraisal, which is evaluation of outcomes of curriculum plan through a single measurement, Amadi (2004). In her view, Summative evaluation occurs at the conclusion of the entire program. This type of evaluation determines

whether the plan has worked as expected. It is used to make final decision about the plan and also helps in determining the nature and value of the curriculum program.

According to Jeremaiah and Alamina (2007), summative evaluation takes place at the end of the developmental process and summarizes the merits of the program. Agina (2003). Stated that summative evaluation is carried out at the end of a program and so it is a post-course evaluation. It is considered as a judgment –oriented evaluation.

Goal –free Evaluation

Amadi (2004) sees goal –free evaluation as the appraisal that considers the actual effects and not just the intended effects of a program. Goal –free evaluation recognizes that in addition to actual goals, unintended results can occur. Therefore, curriculum evaluation should focus on the importance and value of unintended goals. He sees evaluation of goals as an unnecessary but also a possible contaminating step. Through goal –free approach, the evaluators gather data on a wide range of actual effects and would evaluate the importance of these effects in meeting educational needs. Then recommendations are made based on these facts.

Process of Evaluation

Evaluation involves several processes that must be carried out in stages for the achievement of desired results. The process of evaluation depends on the purpose of evaluation. Considering the process of evaluation with regards to the scope of evaluation, Skate (1967) in Adejo (2006) identified three broad areas that should be covered as:

1. Antecedents
2. Transactions and
3. Outcomes.

i. Antecedents are the prevailing conditions, social, cultural setting, and situation of the learners, human and non –human resources which should be put in force before the introduction of the programme.

ii. Transactions involve teaching interaction encounters and activities of the students that take place during teaching – learning phase of the programme.

iii. Outcomes consist of the impact of the implementation of the curriculum on the learners who participated in the programme.

With regards to the purpose of evaluation, Ajagun (2001) pointed out that decision –making pervades five (5) areas of evaluation. They are:

a. Systematic Assessment: Evaluation to aid decision –making on the suitability of the curriculum objectives.

b. Curriculum planning: Evaluation to aid decision-making on the efficacy of planned curriculum in relations to the accomplishment of objectives.

c. Curriculum implementation: Evaluation to aid decision –making on discrepancies between the planned programme and the extent of its implementation

d. Curriculum improvement: Evaluation to aid decision –making on curriculum improvement oriented change.

e. Curriculum certification: Evaluation to aid decision –making on the real worth of the curriculum.

This model of decision spans through all the curriculum evaluation process areas. The implications of this model in the implementation cost are enormous. The decision –making evaluation model assumes that a consensus can be achieved on a general goal for each stage of

programme development and on the criteria to be applied in assisting the achievement on the whole.

In discussing the process of evaluation, a number of factors should guide evaluators in determining which of the models to adopt in carrying out evaluation studies, these include: What is evaluated, purpose, type and scope of the evaluation among others. Stufflebeam (2000) in Idoko (2001) recommends the procedures to be as follows:

- Identification of objectives of educational activities
- Definition of the kind of data needed in making these decisions
- Data collection
- The criteria for determining the quality of the matter evaluated
- Analysis of data in terms of criteria in (4) above
- Providing data for decision makers.

According to Idoko (2001), the purpose of evaluation should guide evaluators in determining the appropriate statistical analytical procedure and tool to be employed. In a similar view, Michael (2013) explained that curriculum evaluation involves the identification and provision of information, selection of criteria, data collection and analysis and drawing logical conclusions for specific purpose using the said process. He recommends the following six stages for the evaluation process.

- Statement of educational policies and general aims of education
- Production of plan
- Verification
- Implementation of plan
- Evaluation of pay off and follow up

The aim of evaluation should to a large extent determine the process to be adopted in carrying out evaluation. In support of the view, Njoku, (2004) outlined what good principles of evaluation should aim at thus:

- Evaluation must be based on goals and objectives of the education programme being evaluated,
- All personnel of the institutions concerned and other individuals connected with the programme must be committed in the evaluation process.
- Evaluation should be comprehensive.
- All groups of individuals who can contribute must be involved eg teachers, administrative and industrial personnel, parents and external experts.
- It should have a system of recording all the information and data obtained. It is a scientific problem- solving process, therefore, data obtained should be objectively recorded and analyzed and evaluation process should result in judgment about programmes by the evaluators or from outside. It should not just describe programmes but indicate its good and bad aspects and may even include suggestions on how to improve the programme.

To ensure a comprehensive evaluation process, teachers, curriculum experts, school administrators, policy makers, representatives of relevant organizations and groups, employers etc. should be involved and they should be accorded equal rank in the deliberation process.

Models of Curriculum Evaluation

Briade (2006) defines model as a procedure that is useful for structuring. A model aids in the planning and implementation of curriculum evaluation. There are several models that have been

put forward by curriculum evaluators based on the nature, purpose and scope of educational program being evaluated. Lewy (2000) identified four models of evaluation as:

- Goal attainment model by Tyler (1942)
- The judgmental model by Scriven (1967)
- Countenance model by Skate (1967)
- CIPP model by Stufflebeam (2000)

Goal Attainment Model of Tyler (1942)

The goal attainment model was developed by Tyler in 1942. Its major focus is to determine whether or not the instructional objectives of a given curriculum are being achieved. It involves observation on student's performance in order to gather information about goal attainment so that decisions could be made concerning the strength and weakness of the curriculum, (Bebebiafiai, 2008). He stated the following procedures as guide while using this model:

- Establishment of broad goals or objectives
- Classifying the objectives
- Defining the objectives in behavioral terms
- Finding solutions in which achievement of objectives can be shown
- Comparing data with behavioral stated data.

Tyler (1942) in Bebebiafiai, (2008) Stated that the purpose of curriculum evaluation is for goal attainment. This model provides the curriculum developers with a feedback on the short coming of the curriculum. He is of the view that the process of curriculum evaluation should cover the curriculum objectives, curriculum content, learning experiences and also the in-built evaluation aspect of the curriculum.

Judgmental Model of Scriven (1967)

According to Scriven (1967) in Danladi (2006) education is concerned with such questions as: how well does a program perform?

Does it worth it's cost in terms of finance, personnel, time and materials?

To scriven, the purpose of evaluation is to make decisions and to establish justification for such decisions.

Countenance Model of Stake (1967)

This model proposed by Stake (1967) as described in Bebebiafiai (2008) is considered as the most valuable yet conceived evaluation model on three contiguous dimensions through which success or failure of any educational program is measured.

These are: Antecedents, transactions and outcomes (ATO). It is sometimes referred to as ATO model. Antecedents refer to the initial situation of things before teaching takes place which could be linked with outcomes. Antecedents includes, teachers characteristics in the classroom learning environment and curriculum evaluation at this stage (antecedent) subsumes the context input evaluation and provides information on all range of questions that can be asked in relation to curriculum before it is put into action.

Transaction refers to the numerous teacher- student, student,- student, student – material encounters and negotiations in the learning situation. Outcomes are the desired effects to be achieved by the curriculum. He noted that any individual elevator may attempt to refrain from judging or collecting the judgment for others and may seek only to bring to light the worth of the program.

Context, Input, Process and Product (CIPP) Model of Stufflebeam (2000)

The context, input, process and product (CIPP) model by stufflebeam (2000) is Considered as a decision- oriented model of evaluation. The CIPP Framework of Context, Input, Process and Product evaluation is to provide service to decision makers on the above concepts of the programme.

Context Evaluation: This is a basic evaluation, which provides rational for determination of objectives. It defines environment, describes the desired and actual condition pertaining to that environment, identifies unmet needs and unused opportunities and diagnosis the problems. It proves an essential basis for developing objectives whose achievement will result in program improvement.

Input Evaluation: The need for this evaluation is to provide information for determining how to utilize resources to achieve project objectives. This is accomplished by identifying and assessing; relevant capabilities of the responsible agency; Strategies for achieving project objectives and design for implementing a selected strategy. Alternative designs are assessed in terms of their resources, time and budget requirements, their potential procedural barriers, the consequences of not overcoming these barriers, relevance of the design to project objectives and overall potential of the design to meet project objective. Input evaluation provides information for deciding whether outside assistance should be sought for achieving objectives and what strategy should be employed. For example, adoption of available solutions or development of new ones and what design or procedural plan should be employed for implementing the selected strategy (Bebebiafiai, 2008)

Process Evaluation: The major purpose of process evaluation is to provide periodic feedback about the program, Alamina and Jeremaiah (2007). They noted that process evaluation has three main objectives:

- To detect or predict defects in the procedural design or its implementation during the implementation stage.
- To provide relevant information for program decision making
- To maintain a record of procedure as it occurs.

Product Evaluation:-Product evaluation involves measurement and interpretation of events as it occurs in a project. Product evaluation provides information for decision making to continue, terminate, modify or focus on a change of process. This CIPP evaluation model is thus based on evaluation as a process of delineating, obtaining and providing useful information for judging decision alternatives, (Stufflebeam, 2000)

The CIPP model of evaluation is more systematized and formalized. It specifies a number of sequential steps to be followed in accomplishing any curriculum evaluation model. The CIPP model certainly will ensure a rigorous, empirical and comprehensive evaluation of a programme. It can be easily adapted to fit the evaluation of specific components of the curriculum such as educational needs, beliefs, educational goals, curriculum development, instructional activity units and others. Hence, it would be found useful to adopt and use this model in the present study.

The CIPP model is deemed suitable for the study because by its name, it suggests correcting the needs of the society, it has a set of educational goals stipulated for effective curriculum development process and evaluation method to meet the stated implementation procedure for the Basic Science Curriculum and how it is actually implemented to achieve the standard scientific knowledge in the area of study.

Theoretical Framework

Theories of Curriculum

The theories of curriculum as propounded by social meliorists, John Dewey and social efficiency educators.

Social Meliorists Curriculum Theory

Social meliorists, curriculum theory believe that education is a tool to reform society and create change of the better. This socialization goal was based on the power of the individual's intelligence and the ability to improve on intelligence through education. An individuals' future was not predetermined by gender, race, socio-economic status or any other factors.

"The corruption and vice in the cities, the inequalities of race and gender and the abuse of privilege and power could all be addressed by a curriculum that focused directly on those very issues, thereby raising a new generation equipped to deal effectively with those abuses" (Wikipedia, the free encyclopedia 2010).

John Dewey's Curriculum theory

John Dewey felt that the curriculum should ultimately produce students who would be able to deal effectively with the modern world. Therefore, curriculum should not be presented as a finished abstraction, but should include the child's preconceptions and should incorporate how the child views his or her own world. Dewey uses four instincts or impulses, to describe how to characterize children's behavior. The four instincts according to Dewey are social, constructive, expressive and artistic. Curriculum should build an orderly sense of the world where the child lives.

Dewey hoped to use occupations to connect miniature versions of fundamental activities of life classroom activities. The way Dewey hoped to accomplish this goal was to combine subject

areas and materials. By doing this, Dewey made connections between subjects and the child's life. Dewey is credited for the development of the progressive schools some of which are still in existence today.

Social Efficiency Educators Curriculum Theory

"Social efficiency educators' such as theorists Ross, Bobbitt, Gilbreth, Taylor, and Thorndike were aiming to design a curriculum that would optimize, the "social utility" of each individual in a society. By using education as an efficiency tool, these theorists believed that society could be controlled. Students would be scientifically evaluated and educated towards their predicted role in society. The social efficient curriculum would consist of minute parts or tasks that together formed a bigger concept.

Empirical Studies

Studies on Evaluation

A number of studies have been carried out on evaluation of educational programs in Nigeria. Some of these studies delved into school subjects, curriculum evaluation and other areas related to educational evaluation. The researcher takes a look at some of the studies on evaluation that are relevant to this study.

Patrick (2009) carried out a study to evaluate science teaching in secondary schools in Delta state. Ten research questions were raised and answered. The study employed the descriptive survey design. The population of the study consisted of all senior secondary schools in Delta state. The samples of the study consisted of 90 senior secondary schools, 90 Principals, 270 science teachers and 22,500 students drawn from the three senatorial districts in Delta State. The major instrument used for data collection was a questionnaire. Other methods used for data collection included; interviews and personal observation. Data were analyzed using frequency

and simple percentage. Results indicated that: insufficient time allocation in school time table, persistent use of lecture method in science teaching, persistence of teacher dominated teacher-student interaction in science classroom, non-coverage of science schemes of work, non-regular giving and marking of assignments, non-proper supervision of instructions, non-conduction of practical lessons and non-assessment of students in all the domains are issues confronting science teaching and learning. This work only provides information on the evaluation of basic science as a subject and not basic science curriculum as a whole. More so the population, area of the study and the design could differ thereby making this study necessary.

Braide (2006) in a survey study on evaluation of senior secondary school chemistry curriculum in Rivers State examined the serving teachers' perception and assessed the available chemistry curriculum in River State. The study sample consists of five hundred (500) Chemistry Students and fifty (50) chemistry teachers drawn from twenty (20) secondary schools in Rivers State. Data collected were subjected to descriptive statistical analysis. The findings of the study revealed that the teachers are favourably disposed to the features of the curriculum. The study also revealed that most of the teachers using the chemistry curriculum were not educationally qualified and therefore are not competent to teach the subject effectively.

Bebebiafiai (2008) carried out a study on evaluation of Home Economics Programme at the junior secondary level in Ogbia and Yenagoa Local Government Area of Bayelsa State. The sample for the study consists of twenty (20) home economics teachers and two hundred (200) students drawn from twenty (20) secondary schools in Bayelsa State using stratified sampling technique. The design was survey and data were collected using questionnaires. Among the areas covered by the study were school facilities, Laboratories, availability/ adequacy of resources in the laboratories and qualification of teachers. The findings of this study indicated great lapses in

terms of availability and adequacy of instructional materials, non-availability of laboratory resources such as: Kitchen equipment, ingredients and other facilities, the findings also indicated inadequate qualified teachers teaching Home Economics in junior secondary level in Ogbia and Yenagoa LGA of Bayelsa State.

Studies on Basic Science Curriculum

Okoli and Ugbaja (2011) conducted a research on needed reforms for junior secondary school Basic Science Curriculum for the attainment of Millennium Development Goals MDGs in Aguata Education Zone of Anambra State. The purpose of the study was to investigate the relevance of the contents of the JSS Basic Science Curriculum and the qualifications of Basic Science teachers. The study design was survey and a total of thirty five (35) Basic Science teachers formed the sample. Data were collected using questionnaires. Two research questions guided the study. Data collected were analyzed using mean, standard deviation and percentage.

The result of the study revealed that Basic Science Curriculum contents are very relevant, especially in areas like environmental conservation, pollution, drug abuse, depletion of the ozone layer, digestive system, crude oil etc. The findings also indicated that the qualifications of Basic Science teachers are mostly TCII and NCE holders which implies that there are few Bachelor of Science Certificate Basic Science teachers in the schools.

Based on the findings, the study recommended that Basic Science teachers should attend in – service training to upgrade their knowledge and certificate. Also facilities and equipment should be provided for the effective teaching and learning of Basic Science subject.

Studies on Implementation of Basic Science Curriculum

Nwosu and Ibe (2012) carried out a study on the assessment of teachers level of implementation of Basic Science Curriculum, it's implications for professional development in Yenagoa, Bayelsa State of Nigeria. Two hundred and two (202) Basic Science teachers drawn randomly from a population of four hundred and fifty (450) basic science teachers who participated in the Universal Basic Education Commission, Bayelsa State – University of Nigeria Nsukka in-service training formed the sample for the study. The design was survey and researchers developed questionnaires was used for gathering data for the study. Data were analyzed using mean and standard deviation while t-test was used in testing the hypothesis. The results of the study reveal among others that: teachers have problems of implementation of the curriculum due to inadequate supply of curriculum modules, inability to organize activities as a result of large class size, lack of teaching aids and skipping of unfamiliar topics, male teachers teach better in topics tagged 'difficult' than the females, years of experience influences teachers performance on difficult topics of the curriculum and that teachers do not engage students in performance of real world tasks in assessment of learning outcomes. The problems identified in this study are similar with the present study in terms of implementation of basic science curriculum in schools.

Studies on Gender and Basic Science

Joseph (2001) conducted a study on gender differences in senior secondary school Chemistry performance in Akwa Ibom State. A sample of three hundred and eighty (380) students who have finished SSII in three different secondary schools were used for the study. Stratified random sampling technique was used to get the sample. The design was survey research. Chemistry achievement test was the instrument used to collect data for the study. The

result revealed a significant gender difference in favour of the males. This trend may be attributed to the fact that females regard science subjects as being intellectually complex and task oriented. The researcher decried the rate at which female secondary school students avoid science and noted that it will not make for a sustainable nation building. Based on the findings, the study recommended that gender sensitization package be introduced to serve as an attempt to redress the issue of gender gap in science subjects. The study is related to the present study because both studies are interested on the influence of gender on science as a factor affecting the effective teaching and learning of basic science.

In a study (Abubakar & Adegboyega, 2012) to find out the relationship between primary school pupils' academic performance in Basic Science and Technology with age and gender in Sokoto state, Nigeria, two research questions and two hypotheses were raised to guide the study. The researcher used Correlation Research Design. The research was limited to twelve public primary schools sampled from the four educational zones of Sokoto state Universal Basic Education Board (SUBEB). A population of 2810 and a sample of 690 pupils were obtained using Stratified Proportionate Random Sampling. A 20-item Basic Science and Technology (BST) Performance Test for primary six pupils was employed as instrument for data collection. Student t-test was used in the analysis of data to find difference. Results showed that there was a significant difference between male and female primary school pupils' academic performance in Basic science and technology in favour of the male.

In a study (Arts, Soc, & Oludipe, 2014) that examined the influence of gender and science anxiety on students' academic achievement in basicscience at the Junior Secondary School level. The population for the study comprised the Junior Secondary III (JSIII) students in Ogun State. The sample was One hundred and twenty (120) students drawn from intact classes

of the three randomly selected Junior Secondary Schools in three Local Government Areas of Ogun state. Achievement Test for Basic Science Students, and Science Anxiety Scale were the main instruments used to collect data from students. Descriptive statistics, and Univariate Analysis of Variance (ANOVA), were used to analyze the data collected. Findings indicated that there was significant main effect of science anxiety on the students' academic achievement mean scores in basic science at 0.05 level of significance. But there was no significant effect of gender on students' academic achievement in basic science. And also, there was no significant interaction effect of gender and science anxiety on the academic achievement of students.

With the variable of gender in the two studies above, it means they are related to this present study. But in the case of this work, gender is investigated in terms of the effectiveness of the implementation of the basic science curriculum.

Other Related studies

Adodo & Gbore, (2012) was carried out a study on prediction of attitude and interest of science students of different ability on their academic performance in Basic Science. Three instruments were used for the study to include; Science Oriented Attitude Scale (SOAS), Science Vocational Interest Inventory (SVII) and Achievement Test in Integrated Science (ATIS). The study is a quasi-experimental type. The sample of the study consisted of 30 Junior Secondary School one Students in Nigeria. Multiple regression was used to analyze the hypothesis raised for the study and the outcome showed that Science Interest possessed the strongest strength for predicting performance than attitude among the students in their different ability level group.

The similarity between the above study and this present work is in the area of basic science achievement. Obviously, the study only considered how the variables of interest and attitude can affect basic science achievement but fail to recognize the fact that the

implementation process could as well affect achievement in the subject. Moreover the intended research methods differ from those employed in the above study. Hence, this present research is needful.

Nnadi (2015) examined the availability of instructional materials, its adequacy and relevancy; characteristics of instructional materials, importance of instructional materials, and factors affecting the use of instructional materials on students' academic performance in agricultural science. Four research questions and four null hypotheses (Ho) were formulated to guide the study. This study made use of Survey Research Design. Thirty (30) Government and private secondary schools were used. It had the population of 8,142 agricultural science students and 73 agricultural science teachers. Sample of 206 students were randomly selected with 30 agricultural science teachers. The instrument used for collection of data was a questionnaire designed by the researcher for the teachers and students of agricultural science. The data collected for the pilot study was used to calculate the reliability coefficient using split-half method and also Pearson Product Moment Correlation Coefficient (r), which gave 0.87. Contingency chi-square statistical tool was used in testing the hypotheses at 0.05 level of significance. Results showed that good and relevant textbooks were the instructional materials available to be used to influence students' academic performance in agricultural science. Findings also showed that instructional materials lack simplicity, attractiveness, and clarity. Again, results revealed that teachers' qualification and experience are factors affecting the use of instructional materials to influence students' academic performance in agricultural science in secondary schools.

A research (Likoko, Mutsotso, & Nasongo, 2013) carried out in eight private teacher training colleges in Western Province in Kenya was aimed at determining the adequacy of

instructional materials and physical facilities and their effects on quality of teacher preparation in emerging private primary teacher training colleges. Three research questions guided the study, and the descriptive survey design was adopted for the study. The sample of the study was selected using simple random and purposive sampling techniques. The sample comprised of 8 college principals, 43 tutors and 416 second year teacher trainees. Data was collected through questionnaires and observation checklists. The SPSS computer package was utilized in the analysis of descriptive statistics such as frequencies and percentages. The findings established that there is non-availability in adequacy of facilities/materials for teaching and learning in most schools which has adverse effect on the achievement of the expected objectives.

Afework (2014) studied the availability of school facilities and their impacts on quality of education with three research questions serving as a guide to the study. Descriptive survey design was adopted. The sample of the study was selected using simple random sampling technique. School principals, district and regional education bureau heads in the region constituted the population from where the sample of the research was drawn. The study was carried out in 24 primary schools in Eastern Hararghe zone and 12 primary schools in Harari regional state in Ethiopia The data collection instruments were questionnaire, interview and observation. The data analysis was done using statistical tools such as percentages, frequencies, means and grand means. Research result showed that school facilities and instructional materials were less available, less in quantity and quality which poses a great challenge on teaching and learning activities with a negative impact on the improvement of the quality of education.

In a study Okafor (2014) that investigated the relationships between utilization of laboratory facilities and academic performance of students in Basic science in junior secondary schools in Zamfara State, Nigeria, three null hypotheses guided the study. Descriptive survey

design was used. A total of sixty three (63) schools were sampled from the four Educational Zones of the State. Three hundred and seventy five (375) students and one hundred and fifty-five (155) teachers were selected using stratified sampling technique. The research instruments were Basic science laboratory facility checklist (BSLFC) for teachers and students utilization of Basic science laboratory facilities (SUBSLF). The students' utilization of Basic science laboratory facilities had a reliability coefficient of 0.71 which was used. Data collected were analyzed using Spearman's Rank order and t-test statistics to determine relationship and differences at $p \leq 0.05$. The findings from the study showed that; there are no adequate functional Basic science laboratory facilities in the junior secondary schools in Zamfara state. Also, result indicated that there is a significant relationship in the mean scores of utilization of Basic science laboratories facilities and students' performance in Basic science in junior secondary schools in Zamfara state. Again, there was no significant difference in the availability of Basic science laboratory facilities in female and male public schools.

Igu, Ogba and Igwe(2012) carried out a study to ascertain the effects of instructional materials on students' achievement in social studies in lower Basic education in Nigeria using Ebonyi state College of education Ikwo staff school and Christ the king primary school, Ikwo as the case study. The design of the study was quasi experimental. The population of the study comprised all the students in primary five of the two schools used for the study totaling two hundred (200). Due to the smallness of the number, no sampling was carried out on the population. However, simple random sampling technique was applied to choose the experimental and control groups. The instrument for data collection was Social Studies Achievement Test (SSAT) questionnaire. It contained a twenty (20) item multiple choice questions based on the topics selected for the study. Kuder Richardson -20 statistic was used to test the reliability of the

instrument and it yielded 0.80 which was deemed high enough for the study. The research questions were analyzed using adjusted mean and standard deviation. Analysis of covariance (ANCOVA) was used to test the null hypotheses. The result revealed that those taught with instructional materials performed significantly better than those taught without instructional materials.

The four studies reviewed above are useful to this present study because they provide relevant information related to availability and functionality of teaching facilities. Although, the studies are not directly concern with the availability and functionality of facilities for teaching basic science, as instructional material they become related since they play the same role in curriculum implementation. However, the intended research design, population and area of study of this present study, could be different from those employed in the above study. The intended method of data analysis could also be different; hence this present study is highly imperative.

Aliyu et al (2015) examined the influence of teachers' qualifications on performance in further mathematics among secondary school students in Kaduna state. By purposive sampling, 12 senior secondary schools were selected from four inspectorate divisions in the state. A random sample of 160 further mathematics students was later selected across the four divisions. Two instruments: Teacher Self-Assessment Test (TSAT) with reliability index of 0.87 and a 30-item four option multiple choice Further Mathematics Achievement Test (FMAT) constructed by the researchers (with cronbach's alpha of 0.87 and item difficulty of $0.40 < p < 0.82$) were administered. Two research questions and one hypothesis were formulated to guide the study. The data collected were analyzed using Analysis of Variance (ANOVA). The findings revealed that significant difference exists between students performance on account of their teachers' qualifications.

Zuzovsky (2003) conducted a study on teachers' qualifications and their impact on student achievement. Using data collected as part of TIMSS-2003 in Israel made it possible to validate the assumptions regarding the relationship between some teachers' characteristics and students' achievements. The findings revealed that, lack of participation in content-focused professional development, lack of mastery of the subject matter and poorly trained teachers are the causes of poor teaching of science in schools.

More so Abe (2014) examined the effect of teachers' qualification on students' performance in mathematics. The three hypotheses guided the study. Quasi-experimental design was adopted for the study. Three hundred (300) students were randomly selected from ten schools purposively selected from sixteen secondary schools in Ikere Local Government Area of Ekiti State and used as sampled for the study. The qualification of the teachers was used as the criteria for selection of mathematics teachers. The results showed that a significant difference existed in the performances of students taught by professional teachers and non professional teachers, between students taught by NCE teachers and B.Sc Ed. Teachers and also between B.Sc teachers and B.Sc Ed. teachers at $P < 0.05$.

Again, in a study (Fakeye, 2012) on the extent to which teachers 'qualification and subject mastery predicts students' achievement in English language among senior secondary students in Ibarapa Division of Oyo state. The study adopted a descriptive research design of survey type to provide answers to four research questions. The study covered twenty (20) senior secondary schools randomly sampled. In each of the schools, a total number of fifty (50) senior secondary II students were selected to participate in the study making a total of one thousand (1000) S.S.II students in all. All the S.S. II English language teachers in the selected schools also participated in the study. Subject Mastery(r=.74) Questionnaire and English Language

Achievement Test(r=.72) were used in data collection. Data collected were analyzed using frequency counts and simple percentage. Multiple regression analysis was also used for data analysis. Data were analyzed at 0.05 level of significance. The findings of this study showed that: Teachers' teaching qualification has a significant relative contribution to students' academic achievement in English language.

The studies reviewed above are relevant to this present work in terms of teacher's qualification which makes the studies related to this one. However the studies differ from the present work in purpose and procedure. Therefore this work is pertinent.

In a study (Okolie, Elom, & Inyiagu, 2014) designed to identify factors affecting students' performance in basic technology in Junior Secondary School Certificate Examination in Nigerian public schools, four research questions were raised to guide the study. The quantitative research design was employed. The population of the study consisted of three thousand one hundred and twenty six (3126) basic technology teachers and students. A sample of three hundred (300) was selected through random sampling. The instrument used for data collection was a researcher structured questionnaire. The data collected were analyzed using mean. Findings revealed that students has low interest in studying basic technology, teachers' methods of teaching also effect students' performance, insufficient number of qualified staff, poor training materials, poor administration and supervision of schools affects students' performance in basic technology.

A study (Osuolale, 2014) was also conducted to determine the problems of teaching and learning science in junior secondary schools in Nasarawa state, Nigeria. Two research questions were raised. (1) What factors are responsible for the difficulty in the teaching and learning of basic science in secondary schools? (2) What strategies could be adopted to enhance better

teaching and learning of basic science in junior secondary schools? Descriptive survey design was adopted. Two different questionnaires were administered to a sample of one hundred and fifty (150) students and twenty (20) science teachers drawn from ten (10) secondary schools in Nasarawa State in order to collect data. The data collected were analyzed using mean. Findings revealed that; the teaching and learning environment is not conducive, the foundation of teachers in science subjects is poor, and the Students have poor foundation in science.

Samuel, Bandele and Faremi, (2012) investigated the challenges facing the implementation of the Technical College Curriculum in South West, Nigeria. The study employed survey research design; the sample consisted of 120 Basic Science Teachers and Technical Instructors selected from Technical Colleges in two States using multistage sampling technique. Questionnaire on Challenges Facing Curriculum Implementation (QCFCI) with reliability coefficient of 0.72 was used to collect necessary data. The data collected were analyzed using descriptive and inferential statistics. The study revealed that 65.83 percent of the Teachers and Instructors are professionally qualified to teach in Technical Colleges. The study also revealed some challenges facing the implementation of the Curriculum to include; lack of in-service training and poor condition of service of Teachers and Instructors, outdated equipment, unstable government policy; lack of standard workshop for practical work and lack of related modern instructional materials. The study as well revealed that there is no significant difference between the view of the Instructors and Teachers on the challenges facing the implementation of the curriculum.

The three works reviewed above are related to this present study as they are basically concerned with the challenges or factors affecting curriculum implementation which is the subject matter of this study. But the works were not aimed at evaluating the effectiveness of the

implementation of the basic science curriculum, hence the need for this research work. Nonetheless, the procedure or methods of research may vary.

In a meta-analysis (Schroeder, Scott, Tolson, Huang, & Lee, 2007) of U.S. research published from 1980 to 2004 on the effect of specific science teaching strategies on student achievement, studies revealed the following science teaching strategies with effect sizes in parentheses: Questioning Strategies (0.74); Manipulation Strategies (0.57); Enhanced Material Strategies (0.29); Assessment Strategies (0.51); Inquiry Strategies (0.65); Enhanced Context Strategies (1.48); Instructional Technology (IT) Strategies (0.48); and Collaborative Learning Strategies (0.95). All these effect sizes were judged to be significant. Also, regression analysis of the studies revealed that internal validity was influenced by Publication Type, Type of Study, and Test Type. While the external validity was not influenced by Publication Year, Grade Level, Test Content, or Treatment Categories.

Aneke (2015), carried out a study to assess the instructional methods adopted by teachers of agricultural science in secondary schools for enhanced skill acquisition for self-reliance in Enugu State. Two research questions and two null hypotheses guided the study. The study adopted survey research design. The population for the study was 131 made up of 38 male and 93 female teacher of agriculture from the zones under study. A sample of 122 respondents comprising 90 agricultural science teachers, teaching in urban schools and 32 teachers, teaching in rural schools was used for the study. A structured questionnaire made up of 28 items was used to elicit responses from the sample. In the data analysis, mean with standard deviation was used to answer the research questions, while t-test was used to test the null hypotheses at 0.05 level of significance. The results of the study showed that teachers used demonstration, action research method, individual teaching method, field experience (farm) teaching, field trip methods of

teacher, etc to a great extent. The result also indicated that instructional methods adopted by teachers did not differ significantly.

In a study (Bimbola & Daniel, 2010) aimed at examining the effectiveness of constructivist-based teaching strategy on academic performance in integrated science by Junior Secondary School students in South-West Nigeria, two hypotheses guided the study. The Quasi experimental research design was used to achieve the purpose of the study. Participants were 120 Junior Secondary School Students randomly selected from four out of the 25 co-educational Junior Secondary Schools in Ijebu-ode local government area of Ogun state, South-west Nigeria. Data were analyzed using t-test statistic. Findings revealed that the constructivist instructed students had higher scores on the post test and the delayed post test, compared to those exposed to conventional (lecture) method of teaching.

In another study (Auwal, 2013) that determined the effect of two teaching methods (demonstration and discussion) on student's retention of Agricultural science knowledge in secondary schools of Bauchi metropolis, two research questions and three null hypotheses guided the study. Specifically, Ho1; stated that, there is no significant difference between the mean scores of students taught with the discussion method and those taught with demonstration method on an achievement test administered at the conclusion of the instructional unit. The Quasi experimental design was adopted. All the students from three intact SS II classes were used; one class each from three randomly selected schools. A 20 item multiple choice achievement test was the instrument administered to the two treatment groups before and after the treatment, and the scores obtained were analyzed using mean, standard deviation and t-test. The findings revealed that both the two teaching methods have significant effect on student's

retention of Agricultural Science knowledge. But, demonstration method was found to be more effective in making the students to remember Agricultural Science knowledge.

A study was conducted by Auta, (2015) to identify strategies for evaluation of students' proficiency in practical skills in NCE (technical) Building Technology Education. Two research questions and one hypothesis guided the study. The descriptive survey research design was adopted for the study. The population for the study comprised the 51 Technical Teachers in the School of Technical Education, Federal College of Education (Technical), Potiskum. There was no sampling employed for this study due to small size of the population. A questionnaire was the instrument used in collecting data from respondent. The data obtained were analyzed using mean and standard deviation and t-test. The study findings revealed that oral and written test, preparation of observation with checklist, questioning, and assessing students independence in handling practical task, assessing students ability in following the proper steps of procedure, assessing the overall quality of the completed task were some of the strategies adopted for the effective evaluation of students. The result of the study also showed that there was no significant difference in evaluation techniques adopted by teachers.

In the forgoing studies reviewed, it is important to note that the studies gave insight on teaching methods and evaluation techniques. But this present study will like to determine the teaching methods evaluation techniques adopted during the implementation of the basic science curriculum and whether they are actually utilized which is not the case with the above studies reviewed. However, the studies differ from this research in purpose and methods, thus this present study is important.

Summary of Reviewed Literature

This chapter was organized and reviewed under the following subheadings: conceptual framework, theoretical framework, empirical studies and summary of literature review. The conceptual framework was concerned with explanation of basic concepts related to the topic of this study. The concept of curriculum is generally defined as Curriculum a document with selected activities, experiences and situations that the school selects or organizes systematically to bring about positive changes in the behaviour of individual(s) culminating in the totality of his personal, social and professional development. The concept of evaluation has been defined as the as the process of making a value and objective judgment about a programme or project. Different types of evaluation were discussed to include diagnostic evaluation applied to determine the strength and areas of improvement of a programme, the formative evaluation which takes place during the course of the programme to monitor progress, the summative evaluation which measures the final outcome of the programme and the goal-free evaluation which measures the extent of unintended goals achieved. S

However, Evaluation is generally considered as an essential tool for determining the effectiveness of any given programme in line with the set goals. In specific terms the purposes of evaluation as identified by many researchers include; for decision making/judgment, course improvement, accountability of objective, and measurement/assessment. The evaluation process is guided by different available models. These models include; the goal attainment model, judgmental model, Countenance model, and the CIPP model.

The goal attainment model was developed by Tyler in 1942 and its major focus is to determine whether or not the instructional objectives of a given curriculum are being achieved. The Judgmental Model by Scriven (1967) believes that the purpose of evaluation is to make

decisions and to establish justification for such decisions. More so Stake's (1967) Countenance Model proposed that evaluation is based on three contiguous dimensions through which success or failure of any educational program is measured. Whereas, the Stufflebeam's (2000) Context, Input, Process and Product (CIPP) Model believe that evaluation is to provide service to decision makers about a programme. These models can be applied in evaluating any curriculum implemented.

Moreover, the concept of curriculum implementation is defined as the process of putting the various decisions made in the planning stage of the curriculum development process into practice. It is also viewed as the interaction of the teacher, the learner and the curriculum document and the educational environment or what happens in the classroom. The major importance of curriculum implementation is identified as to help in the achievement of set goals and objectives of the educational programme.

Furthermore, an overview of the basic science programme was done. Basic science is defined as a subject area that prepares a child adequately for higher studies by providing a solid foundation on which to build upon in the field of sciences. Some factors have been identified to impede the implementation of the basic science curriculum. these factors, teacher, learners, teaching / learning, gender , instructional material, teachers / student ratio, utilization of information and communication technology (ICT) service, environmental/infrastructural facilities and inadequate funding related factors. The principal actor in the implementation process is the teacher who can actualize or mar the entire curriculum depending on his educational qualification, and competence.

The theoretical framework explored three theories related to the study. They include; social meliorists curriculum theory by Sheldon Berman, John Dewey's curriculum theory and the

social efficiency educators' curriculum theory by Ross. The social meliorists theory explain that education is a tool to reform society and create change of the better. The curriculum theory by John Dewey suggests that the curriculum should ultimately produce learners who will effectively deal with the modern world. However, the social efficiency educators' curriculum theory proposes that a curriculum should epitomize the social utility of each individual in the society.

Empirical studies related to the subject matter of this study were reviewed. Studies reviewed reveal that curriculums implemented sometimes fail to produce the expected result due to lack of teachers' competencies, shortage of instructional materials, inadequate school facilities, and non availability of laboratory resources but did not consider the effectiveness of the implementation process as a whole. Hence, there is need for this present study to empirically provide evidence by evaluating the implementation of the basic science curriculum to determine its effectiveness. Moreover, it was also revealed that achievement is gender sensitive. However, it is evident that most of the studies are based on evaluation and basic science achievement which make them relevant to this present one. But, the studies did not indicate how effective the curriculums could be thereby necessitating this current research. However, the method of data analysis in this study will differ from those adopted by these studies, which also make this present study indispensable. Therefore, in the light of the foregoing issues raised, there is a need to evaluate the implementation of basic science curriculum for junior secondary schools in Enugu state.

CHAPTER THREE

RESEARCH METHOD

This chapter discussed the procedures adopted in carrying out this study and are discussed under the following headings; design of the study, area of the study, population of the study, sample and sampling techniques, instrument for data collection, validation of the instrument, reliability of instrument, method of data collection and method of data analysis.

Design of the Study

The study adopted an Evaluation research design. Evaluation design is the type of design which seeks to ascertain or judge the value of a programme or resources by a careful appraisal determined by a pre-stipulated standard (Okolo, 2011). According to Ali (2006), evaluation design is the type of design that makes value judgment on programs and projects based on certain predetermined criteria. This study adopted evaluation design because the study gathered information which were put together with set criteria to make judgment regarding the strength and weakness, merits or worth of an educational innovation and materials such as Basic Science curriculum, hence the researcher found this design useful in this study because it involved making value judgment on the appropriateness of Basic Science Curriculum implementation in junior secondary schools in Enugu State.

Area of the Study

The study was carried out in Enugu Education Zone of Enugu State. The state has six education zones namely: - Agbani, Awgu, Enugu, Nsukka, Obollo-Afor and Udi. Enugu Education Zone consists of three local government areas namely Enugu East with ten (10) schools, Enugu North has nine (9) schools and Isi-Uzo has eleven (11) schools see appendix A, page 100. Enugu East Local Government Area was used out of the three L.G.A in Enugu

Education Zone. The inhabitants of the zone are predominantly farmers, traders, artisans, civil servant, and public servants. Thus, the zone was selected because of its heterogeneous nature. The choice of the area was informed by the fact that no research have been carried out to evaluate the implementation of the basic science curriculum in the area even when the curriculum seem not to be producing the expected outcomes. The area also has urban and rural schools, mixed schools, teachers with different qualifications and level of experience, so it's suitable for this study.

Population of the Study

The population of the study comprised of all the Basic Science Teachers and the JSSIII students in all the government owned secondary schools in Enugu Education Zone of Enugu State. A total number of 74 Basic Science teachers and 6,386 JSSIII Students made up the population. (Source: planning, research and statistics department, post primary schools management board (PPSMB) Enugu 2015. The JSSIII students were used because they have been exposed to basic science concepts for at least two years and are at the verge of graduating from junior secondary school.

Sample and Sampling Technique

The sample size for this study was 356 respondents. The sample comprised of 319 (123 male and 196 female) JSSIII students and 37 (15 male and 23 female) Basic Science teachers. A multistage sampling technique was adopted for the study. In the first stage, one Local Government area (Enugu East) was drawn out of the three Local Government Areas in Enugu education Zone using simple random sampling technique. In the second stage, three schools with two streams of JSSIII classes were drawn out of the ten (10) governments owned secondary co-educational schools in Enugu East L.G. A using purposive sampling technique and the criteria

for the choice of purposive sampling techniques is that the study need schools with good population of JSS III and schools that covered their scheme of work from JSS I –JSSIII. All the students in the intact classes formed the sample of students for the study. All the 37 basic science teachers in Enugu Education Zone were used for the study, hence no sampling was done for teachers.

Instrument for Data Collection

Basic Science Achievement Test (BSAT), and a researcher constructed questionnaire titled Basic Science Curriculum Implementation Process Questionnaire (BSCIPQ), were used for collecting data for the study. These instruments are described below:-

Basic science achievement test (BSAT)

The BSAT consists of 30 objective test items with 5 options developed using past questions on Basic Science and Basic Science text books. The contents were drawn from the following units in the junior secondary school basic science curriculum.

1. Environmental conservation
2. Elements, compounds and mixtures
3. Digestion in man and simple food text

To determine the number of items to be generated from a particular unit, the researcher made use of table of specification. The first three cognitive levels were used in constructing the items. They are knowledge k, comprehensive C, and application A. The objective levels were limited to the first three based on the fact that at junior secondary school level, emphasis is on the lower levels of the cognitive domain. The test blue print for the BSAT is shown in Appendix B page 127, the achievement test for the BSAT is shown in Appendix C page 128 while the marking guide is shown in Appendix D page 132.

Basic Science Curriculum Implementation Process Questionnaire (BSCIPQ)

The Basic Science Curriculum Implementation Process Questionnaire is made up of two parts. Part one sought information about respondents personal data such as: gender, name of school, class taught, local government area of school and highest educational qualification.

Part two contains statements structured according to the research questions and was grouped into 5 clusters viz A,B,C,D, E, F and G. Cluster A has 10 items which sought information on the extent of achievement of basic science objectives by the teachers. Its response options include: very high extent, high extent, low extent, very low extent. Cluster B, C and D has 54 items each which were on the availability, functionality and utilization of basic science facilities in the schools with response options of available, not available, functional, not functional (for availability and functionality) and very often, sometimes, rarely and not at all (for utilization). Clusters E,F and G have 19, 5 and 19 items respectively and sought information on the teaching and evaluation techniques being adopted by basic science teachers in teaching and evaluating basic science learning outcomes in junior secondary school respectively. Their response options include: always, often, rarely, never (for teaching methods) and high extent, moderate extent, low extent and not used (for evaluation techniques) and cluster E has 16 items on the problems of implementation of basic science curriculum. The response options are strongly agree, agree, disagree, and strongly disagree. Each cluster has a four point scale. These four points have scores (1, 2, 3 and 4) respectively for negative statements and the reverse (4,3 ,2 and 1) for positive statements. The teachers were expected to respond according to their degree of agreement with the statement by ticking (√) against the response option (see Appendix E page 133). For Cluster B and C, the bench march for acceptance is 50%.

Validation of the Instruments

The instruments were face and content validated by three experts, one from measurement and evaluation and two from science education of the University of Nigeria Nsukka. These experts were requested to examine the instruments BSCIPQ and BSAT in terms of; suitability of the language used in the instrument in terms of clarity and comprehension, appropriateness and adequacy of the items in measuring what they are intended to measure and extent to which the statements assess achievement in the specified topics.

Based on their observations, criticisms and corrections, the research instruments were modified appropriately. In other words, the advice of the experts was used by the researcher to delete and modify the test items. This was done to ensure the correctness of the answers and suitability to the research questions and hypothesis. Moreover, the content validity of the achievement test BSAT was done using the test blue print as in Appendix B page 127.

Reliability of the Instruments

The reliability of the instruments BSAT and BSCIPQ was established by trial testing them on a group of 40 JS3 students and 4 Basic Science teachers from one secondary schools in Agbani Zone which is outside the area of the study. The scores obtained from trial testing were used in determining the reliability of the instruments. Estimates of internal consistency were computed for the BSAT using Kuder Richardson formula 21 (K-R21) and a reliability index of 0.81 was obtained. Cronbach's alpha was used to determine the reliability of BSCIPQ and the coefficients of 0.83, 0.86, 0.83, 0.81 and 0.89 were obtained for cluster A, B, C, D and E respectively. (See Appendix F, Page 143 and Appendix G, Page 145 respectively.

Method of Data Collection

Copies of BSAT and BSCIPQ were administered by the researcher on the spot to the respondents with the help of two research assistants who were given one day training by the researcher on how to administer and retrieve the achievement tests and questionnaires. The use of these research assistants helped to ensure that the actual respondents for whom the instruments were meant were reached. Also on the spot retrieval was to ensure high percentage return of the instruments.

Method of Data Analysis

Data obtained from research question 1, 4, 5, 6, 7, 8 and 9 were analysed used mean and standard deviation. A criterion level of 2.50 and above is set for accepting the mean ratings of an item or otherwise. Also, data obtained from research question 2 and 3 were analysed using frequency and percentage and the bench mark for acceptance is 50%. The null hypothesis was tested using t- test statistics, at 0.05 level of significance.

CHAPTER FOUR

RESULTS

This chapter presented the results of data collected based on the nine research questions and one hypothesis the guided the study. The results were presented individually in line with the research questions and one null hypothesis that guided the study.

Research Question 1:

To what extent do teachers align their teaching strategies to achieve the instructional objectives of Basic Science curriculum?

Table 1: Mean and Standard Deviation of Respondents on the extent teachers align their teaching strategies to achieve the instructional objectives of Basic Science curriculum

S/N	Item Statements	N	Mean	SD	Dec.
1	I teach with appropriate instructional materials to enable the students develop interest in Basic Science and this is in line with the curriculum objectives	37	1.78	0.67	LE
2	I expose students to practical classes which aids in the achievement of curriculum objectives	37	2.00	0.57	LE
3	I teach students basic knowledge and skills in Basic Science to help them think and reason in a logical manner which aids transfer of knowledge	37	1.78	0.58	LE
4	I always get prepared for the Basic Science lesson to enable the students develop more interest in science	37	1.86	0.67	LE
5	I try to cover the scheme of work to enable the students acquire more knowledge in Basic Science	37	2.40	0.55	LE
6	I expose students to development of interest in science by giving them constant assignments and other forms of assessment	37	2.45	0.55	LE
7	I encourage students to take advantage of the numerous career opportunities offered by the study of science such as in Medicine, Pharmacy, Engineering etc which helps in the achievement of curriculum objectives	37	2.08	0.64	LE
8	I inculcate in the students the spirit of preparedness for further studies in science which will help in the achievement of the objectives	37	2.29	0.66	LE
9	I instill in the students the development of survival strategies that will enable them learn to live effectively within the global community	37	1.48	0.50	LE
10	I promote learning by doing and skill development in the students which aids in the realization of the objectives of Basic science.	37	2.37	0.86	LE
	Cluster mean	**37**	**2.05**	**0.23**	**LE**

Result in Table 1 showed the mean and standard deviations of respondents on the extent teachers align their instruction to achieve the objectives of Basic Science curriculum in junior secondary schools. Result showed that Items 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 had mean ratings of 1.78, 2.00, 1.78, 1.86, 2.40, 2.45, 2.08, 2.29, 1.48 and 2.37 with corresponding standard deviations of 0.67, 0.57, 0.58, 0.67, 0.55, 0.55, 0.64, 0.66, 0.50 and 0.86 respectively. However, the cluster mean of 2.05 with a standard deviation of 0.23 was obtained. Since the mean ratings for all the items in table 1 and the cluster mean are within the range of 1.50 to 2.49 for low extent, these mean that the extents to which teachers align their instructions to the achievement of the objectives of Basic Science curriculum in junior secondary schools is low.

Research Question 2:

What are the available facilities for teaching Basic Science in junior secondary schools?

Table 2: Frequency (F) and Percentage (%) on Availability of Facilities for Teaching Basic Science in Secondary Schools

s/no	Item statements	F	%	Decision
1	Basic science laboratory	35	94	A
2	Wall charts	28	75	A
3	Models	31	83	A
4	Measuring cylinder	20	54	A
5	Beakers	29	78	A
6	Test tubes	21	56	A
7	Test tube holders	18	48	NA
8	Test tube rack	29	78	A
9	Pictures	30	81.1	A
10	Films	26	70	A
11	Wheels and axle	29	78	A
12	Connecting wires	21	56	A
13	Iron rod	23	62	A
14	Painted cans	22	59.5	A
15	Preserved animal specimens	24	64	A

16	Specimen of crude oil	22	59.5	A
17	Cork	21	56.8	A
18	Bunsen burner	24	64.9	A
19	Conical flasks	18	48.6	NA
20	Thermometer	22	59	A
21	Indicators	25	67.6	A
22	Tripod stand	23	62.2	A
23	Funnels	28	75	A
24	Filter papers	21	56.8	A
25	Retort stand and clamp	14	37.8	NA
26	Meter rule	29	78.4	A
27	Stop watch	23	62.2	A
28	Tongs of magnesium ribbon	11	29.7	NA
29	Safety goggles	8	21.6	NA
30	Spring balance	12	32.4	NA
31	Dissecting board	29	78.4	A
32	Evaporating flask	8	21.6	NA
33	Evaporating dish	12	32.4	NA
34	Magnifier	26	70.3	NA
35	Pulley	9	24.3	NA
36	Spatula	28	75.7	NA
37	Wire gauze	26	70.3	A
38	Stove	27	73.0	A
39	Screw driver	23	62.2	A
40	Gear	20	54.1	A
41	Car jack	21	56.8	A
42	Scissors	28	75.7	A
43	Battery	30	81.1	A
44	Torch bulbs	20	54.1	A
45	Fuses	22	59.5	A
46	Science text books	25	67.6	A

47	Microscope	28	75.7	A
48	Reagent bottles	27	73.0	A
49	Petri dishes	29	78.4	A
50	Fehling's solution	15	40.5	NA
51	iodine solution	13	35.1	NA
52	Millions reagent	16	43.2	NA
53	Biuret's reagent	23	62.2	A
54	Soil samples	25	67.6	A

Key: *=FFrequency; % = Percentage: N=Number of the Respondents =37*

Data in table two on available facilities for teaching basic science in secondary schoolsl showed that out of the 54facilities listed, only 14 (7,19,25,28,30,32,33,34,35,36,50,51 and 52) has percentage score below the benchmark of 50%, while 40 items (1,2,3,4,5,6,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,26,27,29,31,37,38,39,40,41,42,43,44, 45,46,47,48,49,53 and 54) have percentage scores above50%. This showed that most of the facilities are available for teaching basic science curriculum in secondary schools.

Research Question 3:

Are the functional facilities for teaching Basic Science in junior secondary schools functional?

Table 3: Frequency (F) and Percentage (%) on Functionality of Facilities for Teaching Basic Science in Secondary Schools

s/no	Facilities	F	%	Decision
1	Basic science laboratory	35	94.6	F
2	Wall charts	14	37.8	NF
3	Models	17	45.9	NF
4	Measuring cylinder	20	54.1	F
5	Beakers	7	18.9	NF
6	Test tubes	4	10.8	NF
7	Test tube holders	3	8.1	NF
8	Test tube rack	9	24.3	NF
9	Pictures	9	24.3	NF
10	Films	8	21.6	NF
11	Wheels and axle	8	21.6	NF
12	Connecting wires	6	13.5	NF
13	Iron rod	6	16.2	NF
14	Painted cans	9	24.3	NF
15	Preserved animal specimens	8	21.6	NF
16	Specimen of crude oil	10	27.0	NF
17	Cork	9	24.3	NF
18	Bunsen burner	13	35.1	NF
19	Conical flasks	5	13.5	NF
20	Thermometer	9	24.3	NF
21	Indicators	12	32.4	NF
22	Tripod stand	10	27.0	NF
23	Funnels	12	32.4	NF

24	Filter papers	9	24.3	NF
25	Retort stand and clamp	6	16.2	NF
26	Meter rule	12	32.4	NF
27	Stop watch	23	62.2	F
28	Tongs of magnesium ribbon	11	29.7	NF
29	Safety goggles	8	21.6	NF
30	Spring balance	12	32.4	NF
31	Dissecting board	6	16.2	NF
32	Evaporating flask	8	21.6	NF
33	Evaporating dish	12	32.4	NF
34	Magnifier	8	21.6	NF
35	Pulley	6	16.2	NF
36	Spatula	14	37.8	NF
37	Wire gauze	13	35.1	NF
38	Stove	14	37.8	NF
39	Screw driver	9	24.3	NF
40	Gear	8	21.6	NF
41	Car jack	10	27	NF
42	Scissors	10	27	
43	Battery	14	37.8	NF
44	Torch bulbs	10	27.0	NF
45	Fuses	14	37.8	NF
46	Science text books	15	40.5	NF
47	Microscope	17	45.9	NF
48	Reagent bottles	15	40.5	NF
49	Petri dishes	17	45.9	NF
50	Fehling’s solution	11	29.7	NF
51	iodine solution	10	27.0	NF
52	Millions reagent	8	21.6	NF
53	Biuret’s reagent	13	35.1	NF
54	Soil samples	16	43.2	NF

Key: *=F = Frequency; % = Percentage: N=Number of the Respondents =37*

Data in table two on functional facilities for teaching basic science in secondary schoolsl showed that out of the 54 facilities listed, only 3 (1, 4 and 27) have percentage scores above the benchmark of 50%, while 51 items (2,3,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21, 22,23,24,25,26,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53 and 54) have percentage scores below 50%. This showed that most of the facilities are not functional for teaching basic science curriculum in secondary schools.

Research Question 4:

What are the educational qualifications of teachers who implement the Basic Science curriculum at junior secondary schools level?

Table 4: Educational qualifications of teachers who implement the Basic Science curriculum at junior secondary schools level

Qualifications	Number	Percentage
Ph.D	–	0
M.Sc	–	0
M.Ed	–	0
PGDE	2	5.41
B.Sc Ed	5	13.51
B.Sc	10	27.03
B.Ed	8	21.62
NCE	12	32.43
TCII	–	0
Total	37	100

The Result on Table 4 showed that the number and percentages of teachers teaching basic Science for Ph.D is 0(0%), M.Sc 0(0%), M.Ed 0(0%), PGDE 2(5.41%), B.Sc Ed 5(13.51%), B.Sc 10(27.03%), B.Ed 8(21.62%), NCE 12(32.43%), TCII 0(0%), foreducational qualifications

of teachers implementing the Basic Science curriculum at junior secondary schools level. From the result it can be deduced that there are no teachers with Ph.D, M.Sc, M.Ed and TCII qualifications in implementing the Basic Science curriculum at junior secondary schools level, teachers with other qualifications like PGDE and B.Sc Ed are few, while those with NCE, B.Sc and B.Ed are in majority.

Research Question 5:

To what extent do Basic Science teachers utilize the facilities and instructional materials in teaching Basic Science at junior secondary schools?

Table 5: Mean and Standard deviation of respondents on the extent to which Basic Science teachers utilize the facilities and instructional materials in teaching Basic Science at junior secondary schools

Teachers	N	$\bar{x}$	**SD**	**Dec.**
Male	17	2.33	0.17	LE
Female	20	2.12	0.11	LE
Grand mean	37	2.22	0.14	LE

Key: N = Number of respondents, $\bar{X}$= mean, SD = Standard Deviation,

Result in Table 5 showed the mean and standard deviations of the extent to which Basic Science teachers utilize the facilities and instructional materials in teaching Basic Science at junior secondary schools. The result showed that a cluster mean of 2.33 with a standard deviation of 0.17 for Male teachers and mean of 2.12 with standard deviation of 0.11 for Female teachers was obtained. The grand mean and standard deviation was 2.22 and 0.14. This cluster mean ratings as presented in Table 5 for the extent to which Basic Science teachers utilize the facilities and instructional materials in teaching Basic Science is less than 2.50 set as benchmark. This means that, there is low extent of utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools.

Research Question 6:

What methods do teachers adopt in teaching Basic Science at the junior secondary schools?

Table 6: Mean and Standard Deviation of Respondents on the Methods Teachers Adopt in Teaching Basic Science at the Junior Secondary Schools

S/N	Items	N	Mean	SD	Dec.
1	Lecture	37	2.37	0.86	R
2	Demonstration	37	2.18	0.46	R
3	Project	37	2.51	0.50	O
4	Field trip	37	1.56	0.50	R
5	Guided inquiry (discovery)	37	3.45	0.64	O
6	Discussion	37	3.29	0.57	O
7	Process based learning	37	2.70	0.57	O
8	Active learning approach	37	2.16	0.72	R
9	Brain storming	37	3.29	0.66	O
10	Team teaching	37	2.10	0.73	R
11	Scaffolding method	37	2.35	0.48	R
12	Computer assisted learning	37	1.51	0.50	R
13	Simulation and games	37	1.54	0.69	R
14	Experimental method	37	3.29	0.90	O
15	Problem solving	37	2.67	0.70	O
16	Cooperative learning	37	3.16	0.60	O
17	Use of Analogy	37	1.72	0.45	R
18	Concept Mapping	37	1.45	0.50	N
19	Focus Group Discussion	37	2.81	1.07	O
	Cluster mean	**37**	**2.43**	**0.17**	**R**

Note: A = Always, O = Often, R = Rarely, N = Never

The Result in Table 6 showed the mean and standard deviations of respondents on the methods adopted in teaching Basic Science at the junior secondary schools. Result showed that items 3, 5, 6, 7, 9, 14, 15, 16, and 19 had mean ratings of 2.51, 3.45, 3.29, 2.70, 3.29, 3.29, 2.67, 3.16 and 2.81 with standard deviations of 0.50, 0.64, 0.57, 0.57, 0.66, 0.90, 0.70, 0.60 and 1.07 respectively. The mean ratings are within the range of 2.50 – 3.49 for “often”. These mean that; Project method, Guided inquiry (discovery) method, Discussion method, Process based learning

method, Brain storming method, Experimental method, Problem solving method, Cooperative learning method and Focus Group Discussion method are often adopted by some Basic science teachers in teaching Basic science. However, Table 5 also showed that items 1, 2, 4, 8, 10, 11, 12, 13, 17 and 18 had mean ratings within the range of 1.50 -2.49 for "rarely", meaning that the teachers rarely Lecture method, Demonstration method, Field trip method, Active learning approach, Team teaching method, Scaffolding method, Computer assisted learning method, Simulation and games method, Use of Analogy method and Concept mapping method. The cluster mean of 2.43 with a standard deviation of 0.17 showed that Basic science teachers rarely adopt these teaching methods as presented in table 7 in teaching Basic science.

Research Question 7:

What are the evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools?

Table 7: Mean and Standard Deviation of Respondents on the Evaluation Techniques Adopted by Basic Science Teachers in Evaluating learning outcomes in Junior Secondary Schools

S/N	Item Statements	N	Mean	SD	Dec.
1	Written test (Essay and Objective)	**37**	2.91	0.68	HE
2	Oral test (questions)	**37**	2.70	0.77	HE
3	Project (Team & individual Work Report)	**37**	2.78	0.94	HE
4	Observation report e.g interview	**37**	2.62	0.98	HE
5	Practical test	**37**	2.45	0.86	ME
	Cluster mean	**37**	2.69	0.38	**HE**

HE = High Extent, ME = Moderate Extent

The Result in Table 7 showed the mean and standard deviations of the evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools. Result showed that items 1, 2, 3, and 4 had mean ratings of 2.91, 2.70, 2.78 and 2.62 with standard deviations of 0.68, 0.77, 0.94 and 0.98respectively. This result showed that to a high extent, the evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools include; Written test (Essay and Objective), Oral test

(Questions), Project (Team & individual Work Report) and Observation report e.g interview. Table 9 also showed that item 5 had a mean rating of 2.45 with a standard deviation of 0.86. This result showed that Practical test is moderately adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools. The cluster mean of 2.69 with a standard deviation of 0.38 showed that most of the evaluation techniques are adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools to a high extent.

Research Question 8:

What are the mean achievement score of male and female students in Basic Science?

Table 8:Mean and Standard Deviation of Respondents on the achievement score of male and female students in Basic Science

Variable	N	$\bar{X}$	SD
Male	123	19.38	5.04
Female	196	17.88	4.46

Key: N = Number of Students, $\bar{X}$= mean, SD = Standard Deviation

The result presented in Table 8 shows the mean achievement score of male and female students in Basic Science. The result shows that Male students had a mean achievement score of 19.38 with a standard deviation of 5.04 and the Females had a mean achievement score of 17.88 with a standard deviation of 4.46. The mean difference between male and female students in Basic Science was 1.50. This is an indicative that male students had a higher mean achievement score than females in Basic Science.

Hypothesis 1:

H_{O1}: There is no significant difference in the mean achievement scores of male and female students in Basic science.

Table 9:t-test analysis of the difference in the achievement score of male and female students in Basic Science

Variable	N	$\bar{X}$	SD	df	t-cal	Sig	Dec
Male	123	19.38	5.04	317	2.79	0.01	S
Female	196	17.88	4.46				

Key: N = Number of Students, $\bar{X}$= mean, SD = Standard Deviation, t-cal= t-test value calculated, Df= degree of freedom, Sig= level of Significance, Dec = Decision.

The result in Table 9 showed that t-value of 2.79 with associated probability value of 0.01 and a degree of freedom of 317 was obtained. This associated probability value of 0.01 was less than 0.05 level of significance set as benchmark for testing the hypothesis, and this was found to be significant. Hence, the null hypothesis was rejected, and inference drawn that there was a significant difference between the mean achievement scores of male and female students in Basic science.

Research Question 9:

What are the problems affecting the implementation of Basic Science curriculum?

Table 10: Mean and Standard Deviation of Respondents on the problems affecting the implementation of Basic Science curriculum

S/N	Item Statements	N	Mean	SD	Dec.
1	Some Basic Science teachers do not have the necessary qualification to teach Basic Science	37	2.72	0.73	A
2	Some qualified teachers are not properly trained lacking good knowledge of the content and skills required for the implementation of Basic Science curriculum	37	3.21	0.67	A
3	Strike action due to non- payment of salaries, allowances and non- promotion of teachers	37	3.56	0.50	A
4	Teaching periods for Basic Science is too small	37	3.02	0.83	A
5	Use of lecture method ie talk chalk approach all the time in teaching Basic Science lessons	37	3.29	0.57	A
6	Students – teacher ratio exceeding 40:1	37	2.70	0.57	A
7	Use of innovative and brain tasking approach in teaching Basic Science	37	2.72	0.76	A
8	Some parents prefer the education of male children to that of female children	37	3.29	0.66	A
9	Some cultural belief breeds segregation between male and female learners being together in the classroom	37	2.75	0.79	A
10	Sexual harassment on the part of the female learners leading to low class performance/ achievement or even total withdrawal from school	37	2.94	0.77	A
11	No in-service training, workshops and seminars provided for Basic Science teachers to update their knowledge	37	3.24	0.72	A
12	Incentives are not given to Basic Science teachers to enhance their performance	37	3.08	0.72	A

13	Non- availability of classrooms and Basic Science laboratory in schools	37	3.21	0.62	A
14	Non availability or inadequate teaching materials/laboratory facilities for teaching Basic Science	37	3.08	0.43	A
15	Inability to utilize the available Basic Science facilities by teachers	37	3.16	0.60	A
16	Inadequate funding/budgetary allocation for Basic Science teaching	37	3.13	0.63	A
17	Inability to improvise on the part of the Basic Science teachers to ensure effective teaching/learning	37	3.51	0.55	A
18	Host communities do not support the school in providing the basic facilities for the teaching of Basic Science	37	3.37	0.68	A
19	Non–monitoring of Basic Science teachers on the part of Ministry of Education.	37	2.75	0.98	A
	Cluster mean	**37**	**3.09**	**0.21**	**A**

HE = High Extent, ME = Moderate Extent

Result in Table 10 showed the mean and standard deviations of respondents on the problems affecting the implementation of Basic Science curriculum. Result showed that all the items in table 13 had mean ratings above 2.50 set as criterion for accepting an item. However, the cluster mean of 3.09 with a standard deviation of 0.21 means the respondents agreed that all the items as presented in table 13 are problems affecting the implementation of Basic Science curriculum.

Summary of Findings

Based on the results of data analysis, the following major findings emerged

1. There is low extent to which teachers align their teaching strategies to the achievement of instructional objectives of Basic Science.
2. Most of the facilities are available for teaching basic science curriculum in secondary schools
3. Most of the available facilities are not functional for teaching basic science curriculum in secondary schools

4. there are no teachers with Ph.D, M.Sc, M.Ed and TCII qualifications in implementing the Basic Science curriculum at junior secondary schools level, teachers with other qualifications like PGDE and B.Sc Ed are few, while those with NCE, B.Sc and B.Ed are in majority.

5. The result showed that there is low extent of utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools.
6. Basic science teachers rarely adopt one particular teaching method in teaching Basic science.
7. Result showed that Basic Science teachers, to a high extent adopt the evaluation techniques .in teaching Basic Science.
8. The respondents agreed that all the problems listed affect the implementation of Basic Science curriculum.

CHAPTER FIVE

DISCUSSION OF FINDINGS, IMPLICATIONS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presented the discussion on the major findings of the study, the conclusions, implications of the findings, recommendations, limitations of the study and suggestions for further studies as well as summary of the study.

Discussion of the Findings

The discussions were carried out in line with the major findings of the study and are organized under the following sub-headings.

- Extent to which teachers align their teaching to the achievement of objectives of Basic Science curriculum in junior secondary schools
- Availability and functionality of facilities for teaching Basic Science in junior secondary schools
- Educational qualifications of teachers implementing the Basic Science curriculum at junior secondary schools level
- Extent of Basic Science teachers utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools
- Methods adopted by teachers in teaching Basic Science in junior secondary schools
- Evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools
- Achievement scores of male and female students in Basic Science
- Problems affecting the implementation of Basic Science curriculum

Extent to which teachers align their teaching to the of achievement of objectives of Basic Science curriculum in junior secondary schools

Result of the study showed that there was low extent to which teachers align their teaching strategies to the achievement of instructional objectives of Basic Science. The basic science education curriculum is an innovation in Nigerian education system and teachers are critical factor in the successful implementation of any educational innovation. With regard to the above finding, it could be as a result of the newness of the curriculum or as a result of teacher's lack of understanding of the policy behind the innovations in basic science curriculum. This finding is in line with Nwosu and Ibe (2012) who revealed among others that: teachers have problems of implementation of the curriculum which in turn affect the achievement of the curriculum objectives. Hence, this may be as a result of teachers' attitudes to the use of curriculum and they depend on the school's copy which is not readily available. Many teachers are reluctant to have a personal copy of the curriculum, with the effect that they prepare their lesson plans without consulting the curriculum.

This finding is also consistent with Patrick (2009), who found that insufficient time allocation in school time table, persistent use of lecture method in science teaching, persistence of teacher dominated teacher-student interaction in science classroom, non-coverage of science schemes of work, non-regular giving and marking of assignments, non-proper supervision of instructions, non-conduction of practical lessons and non-assessment of students in all the domains are issues confronting science teaching and learning and this in turn affects the achievement of curriculum objectives. Furthermore, according to Nwosu and Ibe (2012) teachers have problems of implementation of the curriculum due to inadequate supply of curriculum modules, inability to organize activities as a result of large class size, lack of teaching aids and

skipping of unfamiliar topics. The finding of this study therefore revealed that the achievement of the objectives of Basic Science curriculum in junior secondary schools is to a low extent.

Available and functional facilities for teaching Basic Science in junior secondary schools

The finding of the study on the availability of resources for teaching Basic science, result revealed that; some of the facilities are available for teaching Basic science laboratory, while a good number of the facilities are not available. This level of availability could be as a result of governments commitments towards ensuring that schools are better equipped to ensure sustainability of the new basic science. Secondarily, school authorities and other stakeholders in schools are also committed to ensure that schools are equipped with facilities. On the functionality of material resources for teaching basic science, results showed that some of the facilities found in the various schools are not functional. This could be as a result of lack of training on the part of the for teachers to ensure that they learn how to carry out activities using the available instructional material. This may have led to some of the facilities not functional. Oftentimes, the government/school administrator who provided these training are not forthcoming. Year after year the government will not supply materials for the teaching of science subjects. They only talk of science and technology on news media, without backing it up with actions that will lead to its full realization. In this respect, the finding of the study is consistent with Likoko, Mutsotso, & Nasongo, (2013) who carried out a study to determine the adequacy of instructional materials and physical facilities and their effects on quality of teacher preparation in emerging private primary teacher training colleges and found that there is non-availability and adequacy of facilities/materials for teaching and learning in most schools which has adverse effect on the achievement of the expected objectives. The result of the study is also in agreement with Afework (2014) who carried out a study on the availability of school facilities and their

impacts on quality of education and found that school facilities and instructional materials were less available, less in quantity and quality which poses a great challenge on teaching and learning activities with a negative impact on the improvement of the quality of education.

Educational qualifications of teachers implementing the Basic Science curriculum at junior secondary schools level

The findings of this study revealed the qualification of teachers that teach Basic science in junior secondary schools. Their qualifications include NCE, B. Ed and PGDE. The findings of this study agrees with that of (Bola, 2004) who reported that in Nigeria, teachers who are academic and those that are professionally qualified are employed to carry out instruction in the classroom. Academic are the non-professional teachers, it means teachers who have academic training as a result of enrolment into higher educational institution. While professionally qualified teachers, are teachers who get professional training they undergo which are given in educational institutions, which gives them professional knowledge, skills, techniques, aptitude as different from the general education. Therefore, it is expected that level of qualification can make a difference in the teachers who teach basic science and most importantly on the implementation of the curriculum in junior secondary schools. However, the dominance of NCE graduates teaching basic science will likely affect the achievement of the objectives of the curriculum. The finding of the study is consistent with Aliyu et al (2013) who examined the effects of teachers' qualifications on students' performance in further mathematics among secondary school students in Kaduna state and found that significant difference exists between students' performance on account of their teachers' qualifications. Secondly, the finding is in consonant with Abe, (2014) who examined the effect of teachers' qualification on students' achievement in mathematics and found that there was a significant difference in the

performances of students taught by professional teachers and non-professional teachers, between students taught by NCE teachers and B.Sc Ed. teachers and also between students taught by B.Sc teachers and B.Sc Ed. teachers.

The result also agrees with Zuzovsky, (2003) who carried out a study on teachers' qualifications and their impact on student achievement and found that, lack of participation in content-focused professional development, lack of mastery of the subject matter and poorly trained teachers are the causes of poor teaching of science in schools. The finding also supports the result of Abe, (2014) who examined the effect of teachers' qualification on students' performance in mathematics and found that a significant difference existed in the performances of students taught by professional teachers and non-professional teachers, between students taught by NCE teachers and B.Sc Ed. teachers and also between B.Sc teachers and B.Sc Ed. teachers. The result showed that teachers' qualification have significant relative effect on students' academic achievement.

Extent of Basic Science teachers' utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools

The result showed that there is low extent of utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools. This may be as a result of non-availability of these facilities in our schools or because the facilities are not functional. This result is in line with Okafor (2014) who revealed that there are no adequate functional basic science laboratory facilities in the junior secondary schools. Similarly, Afework (2014) reported that school facilities and instructional materials were less available, less in quantity and quality which poses a great challenge on teaching and learning activities with a negative impact on the improvement in the quality of education. The result also is in agreement with Bebebiafiai (2008) who observed

that great lapses in terms of availability, utilization and adequacy of instructional materials, non-availability and utilization of laboratory resources such as: Kitchen equipment, ingredients and other facilities are due to gender. The result of this present study could be due to the fact that male and female teachers perceive things differently, and have distinct attitude towards the utilization of facilities and instructional materials in the teaching of basic sciences.

Methods adopted by teachers in teaching Basic Science in junior secondary schools

The findings revealed that the basic science teachers use various methods to implement the basic science curriculum in the classroom learning environment. They employ Project method, Guided inquiry (discovery) method, Discussion method, Process based learning method, Brain storming method, Experimental method, Problem solving method, Cooperative learning method and Focus Group Discussion method are often adopted by teachers in teaching Basic science, which when appropriately utilized inculcates the desired reflective, critical thinking and problem solving skills to the learner. According to Ikwumelu (2014), a wide spectrum of methods are best for use in teaching basic science, as the choice of many apt teaching methods would not only accommodate the varying needs, interest and background of the learners, but also take cognizance of the essential criteria for selecting basic science teaching methods which include relevance to the needs of the society, the individual learner and the objectives of the programme. This finding was confirmed by Aneke (2015) who also reported that teachers use demonstration, action research, individual teaching method, field experience (farm) teaching etc. to a great extent in teaching. This may be due to the fact that some of these methods adopted in teaching basic science are suitable for the available instructional contents in basic science. Secondarily, Aneke (2015) reported that instructional methods adopted by teachers did not differ significantly. This finding could be as a result of the fact that the male and female teachers undergo the same

professional training and are exposed to the same methods of teaching which influence their decision making in terms of methods to be adopted in teaching Basic Science.

Evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools.

The findings of the study showed that to a high extent, the evaluation techniques adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools include; Written test (Essay and Objective), Oral test (Questions), Project (Team & individual Work Report) and Observation report e.g interview. It also showed that Practical test is moderately adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools. The cluster mean of 2.69 with a standard deviation of 0.38 showed that most of the evaluation techniques are adopted by Basic Science teachers in evaluating learning outcomes in junior secondary schools. The finding was in agreement with Schroeder, Scott, Tolson, Huang, & Lee, (2007) who found that Questioning Strategies and other assessment strategies such as test, interview and observation were adopted to a high extent in evaluating learning outcomes especially in the science subjects. This result was later confirmed by Auta, (2015), who reported that oral and written test, preparation of observation with checklist, questioning, and assessing students independence in handling practical task, assessing students ability to follow procedures, assessing the overall quality of the completed task were some of the strategies adopted for the effective evaluation of students.

The finding of the study is also in line with Schroeder, Scott, Tolson, Huang, & Lee, (2007) who carried out a meta-analysis on the effect of specific science teaching strategies on student achievement and found that Questioning Strategies and other assessment strategies such as test, interview and observation were adopted to a high extent in evaluating learning outcomes

especially in the science subjects. The finding was also in line with Auta, (2015) whose result showed that there was no significant difference in evaluation techniques; oral and written test, observation with checklist, questioning, and strategies in assessing students' independence in handling practical task adopted by teachers. Therefore, since both the male and female teachers undergo the same professional training and are exposed to the same evaluation techniques, there is the likelihood that they will use the same techniques.

Achievement scores of male and female students in Basic Science

The result showed that male students had a mean achievement score of 19.38 with a standard deviation of 5.04 and the Females had a mean achievement score of 17.88 with a standard deviation of 4.46. The mean difference between male and female students in Basic Science was 1.50. This is an indicative that male students had a higher mean achievement score than females in Basic Science. The finding is in agreement with those of Joseph (2001), and Abubakar and Adegboyega (2012) who reported that there was a difference in the mean performance of male and female primary school pupils in Basic science and technology in favour of the male. The result was however contrary to the finding of Arts, Soc, & Oludipe, 2014 that gender have no effect on students' academic achievement in basic science. Thus, in most cases differences are reasonably thought to exist in the performances of male and female in different school subjects. However, while the male students are usually taken to perform highly in science related subjects, the female are perceived to perform better than the male in art subjects. Hence, gender differences in school favour one gender against the other on certain learning tasks depending on the subject matter as is the case with the subject matter of this study.

From the test of hypothesis five which revealed that there was a significant difference between the mean achievement scores of male and female students in Basic science. The

significant difference noticed may be as a result of teachers' qualification, teaching methods, evaluation techniques, extent of utilization of instructional materials and so on. The finding of the study is consistent with Joseph (2001), and Abubakar and Adegboyega (2012) who found that a significant difference exist in the mean achievement scores of male and female students.

Problems affecting the implementation of Basic Science curriculum

The finding of the study showed all the problems listed affect the implementation of Basic Science curriculum. This could be as a result of consistent government's insensitivity to the needs and demands of schools in terms of provision of infrastructure and personnel. Or as a result teacher's lack of knowledge of what is expected of them. The finding of the study is consistent with Nwosu and Ibe (2012) who submitted among others that: teachers have problems of implementation of the curriculum due to inadequate supply of curriculum modules, inability to organize activities as a result of large class size, lack of teaching aids and skipping of unfamiliar topics, male teachers teach better in topics tagged 'difficult' than the females (i.e. gender influence), years of experience influences teachers performance on difficult topics of the curriculum and that teachers do not engage students in performance of real world tasks in assessment of learning outcomes. Also, Osuolale (2014) noted that the teaching and learning environment is not conducive, the foundation of teachers in science subjects is poor, which in turn gives the students poor foundation in science. Hence, most schools in the country are not very conducive for teaching and learning, some are poorly equipped, and lack the required facilities for providing and enhancing the implementation of the different school curricular.

The result was also in agreement with Nwosu and Ibe (2012) who found that: inability to organize activities as a result of large class size, lack of teaching aids and skipping of unfamiliar topics, male teachers teach better in topics tagged 'difficult' than the females (i.e. gender

influence), years of experience influences teachers performance on difficult topics of the curriculum and that teachers do not engage students in performance of real world tasks in assessment of learning outcomes. Furthermore, Osuolale (2014) observed no differences in the rating of people on inadequate instructional facilities, the teaching and learning environment not being conducive and the foundation of teachers in science subjects being poor are among the problems most teachers face during implementation of the curriculum. This may be due to the fact that most teachers suffer the same challenges during the implementation of the curriculum.

Conclusions

Based on the findings of this study, the following conclusions were drawn.

1. There is low extent to which teachers align their teaching strategies to the achievement of instructional objectives of Basic Science.
2. Most of the facilities are available for teaching basic science curriculum in secondary schools
3. Most of the available facilities are not functional for teaching basic science curriculum in secondary schools
4. there are no teachers with Ph.D, M.Sc, M.Ed and TCII qualifications in implementing the Basic Science curriculum at junior secondary schools level, teachers with other qualifications like PGDE and B.Sc Ed are few, while those with NCE, B.Sc and B.Ed are in majority.
5. The result showed that there is low extent of utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools.
6. Basic science teachers rarely adopt one particular teaching method in teaching Basic science.
7. Result showed that Basic Science teachers to a high extent adopt the evaluation techniques .in teaching Basic Science.

8. The respondents agreed that all the problems listed affect the implementation of Basic Science curriculum.
9. Male students achieved higher than their female counterparts in Basic science

Educational Implications

The findings of this study have provided empirical evidence on the implementation of Basic Science Curriculum in junior secondary schools in Enugu Zone. The findings of the study have some implications for teachers and students, policy makers as well as curriculum developers.

Since effective/proper implementation of the basic science curriculum promotes learning, enhance student-student participation in the learning process, poor implementation of the basic science curriculum by teachers will not allow the student benefit from the subject.

Also poor implementation of teaching methods by basic science teachers can mar the essence of learning, which is to make learning more interactive and more effective for better academic performance.

The result of the study showed that the achievement of the objectives of Basic Science curriculum in junior secondary schools is to a low extent. This implies that some facilities for teaching Basic Science in junior secondary schools are neither available nor functional. This also was influenced by teachers' qualification and lack of instructional materials to teach basic science.

The finding of the study also showed that basic Science teachers utilize the facilities and instructional materials in teaching Basic Science at junior secondary schools to a low extent. This implies that the teachers may not teachers may not be able teach will and students may not be able to achieve high in basic science examinations.

Recommendations

Based on the findings of the study, these recommendations are made.

1. Since the result of the study showed that the achievement of the objectives of Basic Science curriculum in junior secondary schools is to a low extent, the government and ministry of education should organize workshops for teachers to update their knowledge on how to achieve the curriculum objectives, provide the necessary things needed for such implementation.
2. The planners and developers of the Basic Science curriculum should try as a matter of urgency to determine the extent to which the plan or program developed is actually been executed in the State. Based on the information, they would be able to make necessary provisions, amendments and or modifications, not only in the Basic Science curriculum but also in future science and non-science curricula.
3. The Universal Basic Education Commission UBEC should organize more workshops and seminars for Basic Science teachers in particular and other science teachers in general to equip them with the necessary knowledge needed on the implementation of basic science curriculum.
4. The teachers who are the implementers of Basic Science curriculum should assess themselves with respect to Basic Science teaching. They should try to compare what they actually do and what is expected of them. Supervisors as well as principals of schools should employ only teachers who have the necessary qualification and experience to teach basic science. This will help in the implementation of the objectives of basic science curriculum.

Limitations of the Study

Research of this nature involving human elements is subject to some limitations. Such limitations may include;

1. Possibly, there could be some faking of responses to the items on the questionnaire. This might affect the findings of this study.
2. Another limitation of this study was finance. The fund was inadequate. The cost of materials used for this research such as journals, textbooks, internet browsing and so on was not favourable at all.

Suggestions for Further Studies

Based on the limitations of the study, the following suggestions were made for further studies.

1. There is need to replicate the study with a large population and in different geographical areas.
2. Another area of interest for further studies is Evaluation of the implementation of science subjects in senior secondary schools in Enugu state.
3. Availability and extent of utilization of instructional materials for the implementation of basic science curriculum in junior secondary schools in Enugu state, Nigeria.

Summary of the Study

The basic aim of science is to help man to systematically examine natural events in order to discover facts about them and formulate laws and principles based on these facts. This cannot be achieved without providing the young people with experiences that will foster their physical, social, emotional and intellectual growth through Basic Science. Hence, basic science is fundamental to the learning of all science and science related subjects since it combine aspects of science. Nonetheless, basic science introduces the children to logical thinking and the scientific

method, due to the fact that learning at this stage is crucial since brain development occurs during the first few years of life. On this note, the main purpose of this study was to evaluate the implementation of Basic Science Curriculum in junior secondary schools in Enugu Zone. Specifically, the study was guided by eight purposes. Nine (9) research questions were answered and also one (1) null hypothesis was tested at 0.05 level of significance.

However, related literature were organized and reviewed under: conceptual framework, theoretical framework, empirical studies and summary of literature review. Most studies revealed that achievement is sensitive to gender. The studies provided adequate insights which enabled the researcher to support the findings of the present study. The study adopted an Evaluation research design. Evaluation design is the type of design which seeks to ascertain or judge the value of a programme or resources by a careful appraisal determined by a pre-stipulated standard. The study was carried out in Enugu Education Zone of Enugu State. The population of the study comprised of all the Basic Science Teachers and the JSSIII students in all the government owned secondary schools in Enugu Education Zone of Enugu State. A total number of 74 Basic Science teachers and 6,386 JSSIII Students make up the population. A sample of 319 JSSIII students and 37 Basic Science teachers were used for the study. Basic Science Achievement Test (BSAT), and a researcher constructed questionnaire titled Basic Science Curriculum Implementation Process Questionnaire (BSCIPQ), were used for data collection for the study.

The instruments were face and content validated by three experts, one from measurement and evaluation and two from science education of the University of Nigeria Nsukka. Based on their observations, criticisms and corrections, the research instruments were modified appropriately. The reliability of the instruments BSAT and BSCIPQ were established by trial

testing them on a group of 40 JS3 students and 4 Basic Science teachers from one secondary school in Agbani Zone which is outside the area of the study. Estimates of internal consistency were computed for the instruments using Kuder Richardson formula (K-R20) for BSAT and Cronbach's alpha for BSCIPQ with a reliability index of 0.74 and 0.81 respectively

Copies of BSAT and BSCIPQ were administered by the researcher on the spot to the respondents with the help of two research assistants who were given one day training by the researcher on how to administer and retrieve the achievement tests and questionnaires. Scores obtained from the instruments BSAT and BSCIPQ were analyzed using mean (x) and standard deviation (SD) in order to provide answers for the research questions while the null hypotheses were tested using t- test statistics at 0.05 level of significance. The findings of the study among others showed that; there is low extent to which teachers align their teaching strategies to the achievement of instructional objectives of Basic Science. Most of the facilities are available for teaching basic science curriculum in secondary schools. Most of the available facilities are not functional for teaching basic science curriculum in secondary school. There are no teachers with Ph.D, M.Sc, M.Ed and TCII qualifications in implementing the Basic Science curriculum at junior secondary schools level, teachers with other qualifications like PGDE and B.Sc Ed are few, while those with NCE, B.Sc and B.Ed are in majority. The result showed that there is low extent of utilization of facilities and instructional materials in teaching Basic Science at junior secondary schools. Basic science teachers rarely adopt one particular teaching method in teaching Basic science.

The implication of the above findings were highlighted and it was recommended among others that since the result of the study showed that the achievement of the objectives of Basic Science curriculum in junior secondary schools is to a low extent, the government and ministry

of education should organize more workshops for teachers to update their knowledge on how to achieve the curriculum objectives, provide the necessary things needed for such implementation. This will help the government to assess and judge their preparedness in the implementation and support for Basic Science Programme in the State. The limitations of this study were highlighted and suggestions were made for further studies.

REFERENCES

Abe, T. O. (2014). The Effect of Teachers' Qualifications on Students' Performance in Mathematics, *Journal of Science Teachers Association of Nigeria(JSTAN) 36* (1), 110-114.

Abubakar, R. B., & Adegboyega, I. (2012). Age And Gender As Determinants Of Academics Achievement of Students, *International Journal Of Educational Research (INJER). 1(2),* 121–127.

Adejoh, M.J. (2006). Evaluation of Integrated Science and Introductory Technology Programme in Secondary Schools in Benue State. *An Unpublished Ph.D Thesis, Faculty of Education University of Jos.*

Adejoh, M.J. (2008). Improving the Quality of Integrated Science and Introductory Technology Curriculum in Secondary Schools. *Nigeria Journal of Teachers Education & Teaching.*4(1), 43-51.

Adekunle, O.E. (2011). *Computer Studies for Beginners* Ibadan: Bounty Press Limited.

Adeniyi, E.O. (2007). *9-Year Basic Science Curriculum.* Abuja, NERDC.

Adeyegbe, U.(2004). *Curriculum Leadership Development and Implementation.* London: Sage Publications.

Adodo, S. O., & Gbore, L. O. (2012). Prediction of Attitude and Interest of Science Students of Different Ability on their Academic Performance in Basic Science, *4*(June), 68–72. Http://Doi.Org/10.5897/IJPC10.049

Afework, T. H. (2014). The Availability of School Facilities and their Effects on the Quality of Education in Government Primary Schools of Harari Regional State and East Hararghe Zone , *Nigeria Journal of Curriculum Studies.* 8(1), 115-121.

Agina, T.N. (2003). *Fundamentals of Curriculum Theory and Development.* Port Harcourt: Integrated Services.

Agusiobo, B.C (2003). Early Childhood Core Curriculum Development. *Nigeria Journal of Curriculum Studies.*10 (2), 30-40.

Ajagun, G.A. (2001). A Study of Performance of Science Students in the Senior School Certificate Examination in Selected Schools in Kaduna State. *Tambari Kano Journal of Education. 6* (2), 114-126.

Ajaja, O.P. (2005). Evaluation of Science Teaching in Secondary Schools in Delta State. *International Journal of Educational Research.* 1 (2), 119-129.

Akinsinde, S.I. (2000). Access of Women to Science and Technology Education in Nigeria.*42nd Annual Conference Proceedings of Science Teachers Association of Nigeria (STAN).*

Aliyu, et al (2013). Effects of Teachers' Qualifications on Performance in Further Mathematics among Secondary School Students, *Journal of Education and Practice, 4*(1), 57–62.

Amadi, O.D. (2004). Evaluation of Bachelor of Education Sandwich Programme of Rivers State College of Education. *Unpublished M.ED Thesis, Department of Science Education, University of Port Harcourt.*

Aneke C. U. (2015).Assessment of Instructional Methods Adopted by Teachers of Agricultural Science in Secondary Schools for Enhanced Skill Acquisition for Self-Reliance in Enugu State, Nigeria. *British Journal of Education, 3 (11), 97-206.*

Anwukah, G.I. (2001). *Curriculum Development for Responsive Education in Third World Countries.* California Cape Publishers, Int'l Ltd.

Arts, S. J., Soc, H., & Oludipe, D. I. (2014). Gender and Science Anxiety as Predictors of Nigerian Junior Secondary Students'Academic Achievement in Basic Science,*Scholars Journal of Arts , Humanities and Social Sciences 2, 197–203.*

Auta, M. S. A. (2015). Strategies for Evaluation of Students' Proficiency in Practical Skills in NCE (Technical) Building Technology Education. *International Journal of Vocational and Technical Education, Vol. 7(9), 96-99.*

Auwal, A. (2013). Effects of Teaching Method on Retention of Agricultural Science Knowledge in Senior Secondary Schools of Bauchi Local Government Area , Nigeria, *4*(4), 63–69. Http://Doi.Org/10.5897/IJSTER2013.0206

Babajide, V.F.T. (2010) Gender Differences in Small Group Discussion in Physics. *International Journal of Science Education.*19 (4), 393-406.

Babalola, V.O. (2004). *Curriculum Implementation and Professionalizing Teaching in Nigeria.* Lagos: Central Education Services 110-119.

Bebebiafiai, B. (2008). Evaluation of the Implementation of the Home Economics Programme at the Junior Secondary Level in Ogbia and Yenagoa L.G.A of Bayelsa State. *An Unpublished M.Ed Thesis. Department of Vocational Education, University of Benin.*

Bimbola, O., & Daniel, O. I. (2010). Effect of Constructivist-Based Teaching Strategy on Academic Performance of Students in Integrated Science at the Junior Secondary School Level, *International Journal of Science Education. 19*(4), 347–353.

Bloom, B.S. (2000).*Taxonomy of Educational Objectives. The Classification of Educational Goals.* New York: David Mckay Co.

Bola, T. O. A. (2004), An assessment of the implementation of the 6-3-3-4 system of Technology Curriculum in Nigeria Junior Secondary schools, *European Journal of Scientific Research* 24(1)112-118 http://www.eurojournals.com/ejsr.htm

Braide, W.I. (2006). Implementation of Senior Secondary School Chemistry Curriculum in Rivers State. *An Unpublished M.Ed Thesis. Department of Science Education, University of Port Harcourt.*

Bruner, J.S. (1960). *The process of Education.* Cambridge: Harvard University Press.

Cronbach, L.J. (2000). *Coefficient Alpha and The Internal Structure of Tests.* Psychometrics, 16 (3), 297-334.

Danladi, N.E. (2006). *Introduction to Curriculum and Instruction.* New York: Joyce Graphic Printers and Publishers Co.

Didi, K.D & Wonu, N. (2010).Assessment of Teachers Computer Literacy Level for Computer Studies Curriculum Implementation. *Journal of Vocational Education and Technology. 7 (1), 85-92.*

Dike, S.C. (2004).Science Curriculum Relevance and Sustainable Development. The Case of Secondary Education in Calabar Nigeria. *Journal of Curriculum Organization of Nigeria* (CON). 1 (1), 54-63.

Doll, C. R. (1974). *Curriculum Improvement: Decision Making and Process.* Boston: Allyn and Bacon.

Ezeudu, F.O(2008) Enrichment of Junior Secondary School Integrated Science Curriculum in a Globalized World. *Proceedings of First International Conference of Faculty of Education, University of Nigeria Nsukka.*

Fafunwa, A.B. (2004). *History of Education in Nigeria (2nd Ed).*Ibadan: NPS Education Publishers Ltd.

Fakeye, D. O. (2012). Teachers' Qualification and Subject Mastery as Predictors of Achievement in English Language in Ibarapapa Division of Oyo State, *12*(3), 0–6.

Fariwontan, E.B. (2008). Evaluation of the Implementation of the National Physics Curriculum for Senior Secondary Schools in Kogi State. *Unpublished Ph.D Thesis Department of Science Education, University of Ilorin.*

Federal Republic of Nigeria (FRN), (2004).*National Policy on Education.* Lagos: NERDC Press.

Garba, G.(2005). Curriculum Reform and Innovation in African Tertiary Institutions for Quality Teaching and Research. *Nigeria Journal of Curriculum Studies* 19 (2) 136-144.

Glaser,R.(2004).Issues on Implementation Process. Http/Www.Searchcom.Techtarget.Com.

Grupta,V. (2014). Gender Stererotypes.Http://Www.Unicef Org/Teachers/Learners/Gender.

Hamza, F.M. (2007).Problems of Realization of Integrated Science Objectives in Nigerian Secondary School, Kano. *The Nigerian Journal of Educational Review.* 6 (6), 98-108.

Idoko, C. E. (2001). Evaluation of the Implementation of the Primary Education Science Core Curriculum. *Unpublished Ph.D Thesis, Department of Science Education, University of Nigeria Nsukka.*

Igu, N. C. N., Ogba, F. N., & Igwe, I. O. (N.D.). Effects of Instructional Materials on Students' Achievement in Social Studies in Lower Basic Education in Nigeria. *International Journal of Educational Research (INJER). 3(1) 37–44*.

Ikwumelu, S.N. (2014). Effects of Self-Directed Instructional Method on Secondary School Students' Achievement in Social Studies *International Journal of Learning & Development 5 (1), 11-18*

Iloputaife, E.C, Maduewesi, B.U & Igbo, I.O (2010). *Issues and Challenges in Nigerian Education. Enugu:* West and Solomon Corporate Ideals Ltd.

Ivowi, U.M.O. (2004). Curriculum and the Total Person. *Journal of Curriculum Organization* JCON 16(1) 1- 8.

Jeremiah, S. (2004). Quality Control and Continues Assessment of Teacher Education in Nigeria. *Journal Of Education (*2),23-25.

Jeremiah, S & Alamina J. I. (2007). *Educational Principles of Curriculum Process and Planning,* Owerri: Career Publishers.

Joseph, E.U. (2001). Gender Differences in Senior Secondary School Chemistry Performance. *Journal of Research in Science Teaching 38 (3) 215-224.*

Lewy, J.B. (2009).*Conducting Small Scale Investigations in Educational Management. L*ondon: Harper and Row Publishers.

Likoko, S., Mutsotso, S., & Nasongo, J. (2013). The Adequacy of Instructional Materials and Physical Facilities and their Effects on Quality of Teacher Preparation in Emerging Private Primary Teacher Training Colleges in Bungoma County , Kenya, *2*(1).

Longe, R.S & Adedeji, 5.0.(2003). Increasing Girls' Access to Technical and Vocational Education in Nigeria. *The Millennium-Innovations in Theory and Practice, Ibadan.* Macmillan Publishers.

Madu, B.C & Orji, E. (2012). From Integrated Science to Basic Science, the Much Needed Transformation in Upper Basic Schools in Nigeria. *International Journal of Educational Research (INJER).11 (1), V57-67.*

Maduewesi, E.J. (2005). *Benchmarks and Global Trends in Education.* Benin: Dasylva Influence Enterprises.

Mailer, A.C. (2011). *Information and Communication Technology.* Http//Www./Cesie.Ie/Ktgu/What.Hmt.

Mbajiogu, N.M (2003). Science, the Teachers' Perspective. (An Introduction to Science Education).44th Annual Proceedings of Science Teachers Association of Nigeria.77-85.

Michael, J.P. (2013). Evaluation of the Implementation of Computer Education Curriculum in Rivers State. *Unpublished ME.D Thesis Department of Science & Computer Education, Enugu State University of Science and Technology.*

Millennium Development Goals Project (2011). *Manual for the Re-Training of Junior Secondary School Teachers*, Kaduna. National Teachers Institute.

Mkpa, M.A (2005). *Curriculum Development and Implementation* Owerri: Tofan Publishing Ltd.

Mustapha, M.T. (2012). Appraisal of the Nigerian Junior Secondary Basic Science Curriculum for Attainment of Universal Basic Education Goals.*53rd Annual Proceedings of Science Teachers Association of Nigeria.*135-141.

Nakpodia E.D (2011). Integrative Funding and Effective Implementation of Universal Basic Education Programme in Central Senatorial District of Delta State. *Journal of Economics and International Finance*. 3 (3), 157-167.

National Teachers Institute, (2011), Reforms and Innovations in Science Education. Kaduna. *Manual for the Re-Training of Junior Secondary Teachers on Basic Science and Technology.*

Nigerian Educational Research and Development Council (NERDC).*Education Curriculum for Junior Secondary Level.*

Njoku, Z.C. (2004). Fostering the Application of Science Education Research Findings in Nigerian Classrooms; Strategies and Need for Teaching Professional Development. *Journal of Science Teachers Association of Nigeria* 39, (1&2) 45-50.

Nnadi, J. (2015). Availability and Utilization of Instructional Materials for the Implementation of the New Biology Curriculum in Senior Secondary Schools in Lagos, Nigeria, *3*(7), 78–86.

Nnorom, C.O. (2011). Availability and Usability of the Basic Science Laboratory Facilities for Teaching Basic Science in Upper Basic Secondary Schools in Anambra. *An Unpublished M.Ed Thesis, Department of Science Education, Nnamdi Azikiwe University (UNIZIK) Awka.*

Nwagbo, R.C (2008). Science, Technology and Mathematics (STM) Curriculum Development: Focus on Problems and Prospects of Biology Curriculum Delivery. *Proceedings of the 49thh Annual Conference of Science Teachers Association of Nigeria 77-81.*

Nwana, P.O. (2007).*Social Studies Foundation Methods and Contemporary Social Problems.* Owerri. Spring Field Publishers Ltd.

Nwankwoala, B. (2009). Evaluation of the Implementation of Social Studies Curriculum in Secondary Schools in Rivers State. *Unpublished M.ED Thesis, Department of Art Education, University of Port Harcourt*.

Nworgu B.G. (2004). *Measurement and Evaluation. Enugu:* University Trust Publishers.

Nworgu, B,G, (2006). *Educational Research Basic Issues and Methodology. (2ed):* Enugu. University Trust Publishers Ltd.

Nworgu, B.G & Agbo, C.N (2000).Gender Differences in School Environment. Any Change in Trend. *Journal of Science Teachers Association of Nigeria (JSTAN), 9 (2)15-28.*

Nworgu, L.N. (2004). Effect of Gender Sensitization of Science Teachers on Gender Gap in Science Achievement and Interest among Students. *Unpublished Ph.D Thesis, Department of Science Education, University of Nigeria Nsukka.*

Nwosu, A.A & Ibe, E. (2012). Assessment of Teachers Level of Implementation of Basic Science Curriculum: Implications for Professional Development. *53rd Proceedings of the Annual Conference of Science Teachers Association of Nigeria (STAN).*190-197.

Nzewi, U.M (2008) Practical Approach to Effective Teaching to Local and Major Biotic Communities (Biomes) to Secondary School Students, for Sustainable Development. J*ournal of Science Teachers Association of Nigeria (JSTAN).*43, 1-6

Obioma, G. (2007). *9- Year Basic Education Curriculum*. Abuja: NERDC Press.

Odo, J.N.(2012). Science Education and Transformation in Nigeria Secondary Schools: The Place of Physics Education. *International Journal of Education Research (INJER).*11(1), 135-142

Offorma, G.C. (2006). *Curriculum Implementation and Instruction* Onitsha: Uni- World Education Publishers Ltd

Ofoegbu, T.O. (2003). Challenges of Implementing Senior Secondary one (SS1) Biology Curriculum in Nigeria. *Journal of Science Teachers Association of Nigeria (JSTAN)* 38 (1&2) 46-50.

Ogunleye, B.O & Babajide, V.F.T (2011).Commitment to Science and Gender as Determinants of Students Achievement and Practical Skills in Physics. *Journal of Science Teacher Association of Nigeria (JSTAN)* 46 (1) 125-133.

Okebukola, P.A. (2000). Level of Process Skill Development among Students & Implications for Science in Nigeria. *26th Annual Proceedings of STAN* 121-125

Okoli, J.N. & Ugbaja, J.N. (2011). Needed Reform for Junior Secondary School Basic Science Curriculum for the Attainment of MDGs. *52nd Annual Proceedings of STAN.192-197.*

Okolie, U. C., Elom, E. N., & Inyiagu, E. E. (2014). Factors Affecting Students' Performance on Basic Technology in Junior Secondary School Certificate Examination, *1*(September), 22–31.

Okoro, A.(2006). Education: it's Contributions to National Development. *Association of Business Education of Nigeria. Book of Readings* 1(6), 10-15

Okoye, P.O. & Igboabuchi, A.N. (2011).Preparedness of STM Teachers Towards the Reform in STEM Education Through Basic Science Teaching in Junior Secondary Schools. 52nd Annual *Proceedings of Science Teachers Association of Nigeria,* 167-174

Olagunju, A.M.& Akanbi, A.A. (2009). Promoting Girl's Participation in Science Technology and Mathematics: Strategies for Entrepreneurship Education in Nigeria. *Gender and STM Education Series* (3) 25-39.

Olaitan, S.O. & Ali, A. (2000).*The Making of a Curriculum; Theory, Process, Product and Evaluation.* Onitsha: Noble Graphic Press Publishing Unit.

Omiko A. (2011). Reforming Science and Technology Curriculum to Meet the Challenges of the Emerging World Order.*52nd Annual Proceedings of the Science Teachers Association of Nigeria (STAN), 30-36*

Omiko, A. (2012). Resources for Effective Implementation of the Universal Basic Education (UBA) in Nigeria: Challenges and Remedies. *53rd Annual Proceedings of Science Teachers Association of Nigeria.*34-39.

Omosewo, T.A & Akanbi, M.C (2009).Availability and Utilization of Instructional Resources for Teaching Basic Science in Kwara. *An Unpublished M.Ed Thesis, Faculty of Education.*

Onah, A.O. (2003). Science Education and Poverty Eradication in Nigeria. *Journal of Eha-Amufu School of Education.*3 (1), 30-38

Onwuachi, W.C. (2012). Quality Assurance in Basic Science Teacher Production. An Imperative for Meeting the Challenges of UBE in Nigeria.*53rd Annual Proceedings of Science Teachers Association of Nigeria.*142-145.

Onwuka, U. (2000). *Curriculum Development for Africa.* Onitsha. African Publishers Ltd.

Osuala, R.C. & Ogoamaka, P.M.C. (2005).Effects of Some Teaching Methods on Students Performance in Senior Secondary School Chemistry. *Alvana Journal of Science,* (5) 25-30.

Osuolale, O. J. (2014). Problems of Teaching and Learning Science in Junior Secondary Schools in Nasarawa State , Nigeria. *Journal of Research in Science Teaching 5(34), 109–119.*

Patrick, A. O. (2009). Evaluation of Science Teaching in Secondary Schools in Delta State 2 - Teaching of the Sciences, *1*(2), 119–129.

Provus, M.M (2000). *Discrepancy Evaluation.* California: Mcutcheon Publisher.

Salau, M.O. (2001). Implementation of the Universal Basic Education Scheme of the Junior Secondary School Level. Issues, Problems & Prospects, *Journal of Curriculum Organization of Nigeria* (JCON). 8 (11), 25-35.

Samuel, P., Bandele, O., & Faremi, Y. A. (2012). An Investigation into the Challenges Facing the Implementation of Technical College Curriculum in South West , Nigeria, *3*(16).

Schroeder, C. M., Scott, T. P., Tolson, H., Huang, T., & Lee, Y. (2007). A Meta-Analysis of National Research : Effects of Teaching Strategies on Student Achievement in Science in the United States, *44*(10), 1436–1460. Http://Doi.Org/10.1002/Tea

Stufflebeam, D.L. (2000) *An Introduction of the PDK Books Educational Evaluation and Decision –Making.* California: Bloomington Ind.

Tahir, G.(2005). The UBE Programme: Issues and Challenges and Implication for Teacher Education Institutions. *Convocation Lectures Delivered at Federal College of Education Kano*

Tay, S., & Hong, S. (2006). Curriculum Evaluation; An Evaluation of Teaching of Science in English in a Rural School in Sabah 1–20.

Taylor, G.O. (2003). *Foundation of Behavioral Research.* Abuja: NERDC Press.

Tuoyo, I.B. (2007). Challenges and Prospects of Using Information and Communication Technology (ICT) in Teaching and Learning of Electronically/Electronics in Technical Colleges in Anambra State. *International Journal of Educational Research* (INJER) 11 (1), 154-161.

Tyler, R.W. (2000). *Basic Principles of Curriculum and Instructions. Http/Www. Instructional Design.Org/Learning Instructions*.

Ugwu, A.N (2004) Science Education in Nigeria Secondary Schools: Implications for Quality Education. The Science Today. *Journal of School of Science, Federal College of Education, Eha-Amufu,* 2(1), 77-81.

Universal Basic Education, (2004).*Addressing the Problems of Basic Education in Nigeria. Abuja: Federal Ministry of Education.*

Webster, F, (2000).Information Technology. Washington: Norwood Press.

Wheeler, D.K (2000). *Curriculum Process.* London*:* University Press.

Wikipedia Free Encyclopedia, (2010).Curriculum Theory Development Http//En.Wikipedia.Org/Curriculum Theory Development.

Wikipedia Free Encyclopedia, (2011).Science Daily Http/Www. Science Daily.Com / Releases.

Zuzovsky, R. (2003). Teachers' Qualifications and their Impact on Students' Achievement : Findings From Timss 2003 Data for Israel, *2003*(Timss), 37–62.

APPENDIX A

List of Government Owned Secondary Schools in Enugu Education Zone

S/No	L.G.A	Name of Schools
1	**Enugu East**	National Grammer School Nike
2	Enugu East	St Patricks Secondary School Emene
3	Enugu East	Girls Secondary School Abakpa Nike
4	Enugu East	Trans-Ekulu Girls Secondary School Enugu
5	Enugu East	New Haven Secondary School Enugu
6	Enugu East	Community Secondary School Ugwogo Nike
7	Enugu East	Girls Secondary School Emene
8	Enugu East	Annunciation Secondary School Nike –uno
9	Enugu East	Community High School Emene
10	Enugu East	Community High School Umuchigbo Iji Nike
11	**Enugu North**	Queens School Enugu
12	Enugu North	Community Secondary School Iva-valley
13	Enugu North	Urban Girls Secondary School Enugu
14	Enugu North	Metropolitan Girl's Secondary School Enugu
15	Enugu North	City Girl's Secondary School Enugu
16	Enugu North	New layout Secondary School Enugu
17	Enugu North	Day Secondary School Independence Layout
18	Enugu North	Government Secondary School Enugu
19	Enugu North	Coal Camp Secondary School Enugu
	ISI UZO	
20	ISI UZO	Ogor community secondary school Ikem
21	ISI UZO	Community Secondary School Neke
22	ISI UZO	Community Secondary School Eha-Amufu
23	ISI UZO	Community Secondary School Mbu
24	ISI UZO	Community Secondary School Umuhu
25	ISI UZO	Community Secondary School Eha-Ohuala
26	ISI UZO	Community Secondary School Umualor
27	ISI UZO	Isi Uzo Secondary School Ikem –Neke
28	ISI UZO	Community Secondary School Isioroto Ikem
29	ISI UZO	Community Secondary School Emeora Neke
30	ISI UZO	Agumade Community Secondary School Ikpakpara

APPENDIX B

TEST BLUE-PRINT FOR (BSAT)

Content	**40% Knowledge**	**30% Comprehension**	**30% Application**	**Total 100%**
Elements, compounds and mixtures 30%	4 (1,3,9,22)	3 (8,10,23)	3 (2,12,20)	10
Environmental Conservation 30%	4 (11,19,25,26)	3 (13,28,30)	3 (7,15,27)	10
Digestion in man and simple food test 40%	2 (4&29)	4 (5,6,14,24)	4 (16,17,18,21)	10
Total 100%	10	10	10	30

APPENDIX C

BASIC SCIENCE ACHIEVEMENT TEST (BSAT)

Name of School ----------

Gender: Male Female

Instruction:

Each question below is followed by a five response options labeled A-E. Select one option that best answers the question and circle with pencil the correct answer. Give only one answer to each question.

Erase completely any answer you wish to change.

QUESTIONS

1. The clear liquid coming out of the funnel during filtration process is called the
   a) Filtrate (b) Impurity (c) Residue (d) Solvent (e) Waste
2. How would you separate a mixture of salt and sand?
   a) Dissolve in alcohol and distill fractionally
   b) Dissolve in alcohol, filter and dry
   c) Dissolve in water and filter
   d) Dissolve in water, filter and evaporate to dryness
   e) Heat the mixture and filter
3. Which of these substances would not dissolve in water?
   a) Acid (b) Paint (c) Salt (d) Soap (e) Sugar
4. The removal of undigested solid material from the body through the anus is called ----------
   a) Egestion (b) Ingestion (c) Inhalation (d) Immutability (e)Respiration
5. Which of the following food items mainly supplies energy?
   a) Beans (b) Butter (c) Meat (d) Milk (e) Yam
6. Which of the following food substances would give a deep blue coloration when iodine is added?
   a) Glucose (b) Lactose (c) Protein (d) Starch (e)Sucrose
7. Conservation of natural resources is important because
   a) It helps man to enjoy
   b) It makes man strong
   c) It makes natural resources available for future use

d) The environment is polluted through conservation

e) Natural resources is a source of energy

8. Fractional distillation is used to separate two liquids with

a) Different boiling points

b) Different chemical composition

c) Equal boiling points

d) Same physical composition

e) Similar chemical and physical properties

9. The following are elements except?

a) Hydrogen (b) Iron (c) Sulphur (d) Water (e) zinc

10. The following are obtained by the fractional distillation of crude oil except?

a) Bitumen (b) Diesel oil (c) Kerosene (d) Light oil

(e) Naphtha

11. Erosion can be controlled by

a. Overgrazing (b) Terracing (c) Road construction (d) Farming (e) shifting cultivation

12. What method is most suitable for separating the different components of school ink?

a. Chromatography (b) Crystallization (c) Distillation (d) Filtration (e)Fractional distillation

13. An indiscrimate destruction of forest without replacement is called -----

a) Deforestation (b) Afforestation (c) Desertification (d)Bush fallowing (e) Crop rotation

14. The process of digestion helps to

a) Acidify our food (b) Add energy to our food (c) Break down our food into small molecules (d) Make our food taste sweet (e) Sort the food we eat into atoms

a) Acids (b) Alkalis (c) Colloids (d) Enzymes (e) Mucin

15. Bush burning can be regulated through

a) Planting of cover crops (b) Crop rotation system

(c) Public awareness (d) Special adaptation (e) Planting of special crops

16. Which of the following is not a part of the digestive system

a) Gullet (b)Liver (c) Mouth (d) Small intestine (e) Stomach

17. In human beings, the absorption of digested food takes place in the

    a) Large intestine (b) Mouth (c) Oesophagus (d) Small intestine (e) Stomach

18. The enzymes ptyalin does not act on all of the following food items except?

    a) Carbohydrates (b) Fats & oils (c) Minerals (d) Proteins (e)Vitamins

19. One of the following is a way of controlling desertification

    a) Overgrazing (b) Bush burning (c) irrigation (d)Deforestation (e) Tillage

20. Which of the following is a product of destructive distillation of coal?

    a) Bitumen (b) coke (c) Diesel oil (d) Kerosene (e) Petrol

21. After digestion, fatty acids, glucose and amino acids are absorbed in the

    a) Anus (b) Large intestine (c) Mouth (d) Small intestine

    (d) Stomach

22. Which of these is not a product of traditional distillation of crude oil?

    a) Diesel (b) Kerosene (c) Naphtha (d) Petrol (e) Soap

23. Which of the following separation methods is used to extract dyes from plants?

    a) Chromatography (b) Decantation (c) Distillation (d)Filtration (e) Sublimation

24. Which of the following is not a digestive juice?

    a) Bile (b) Intestinal juice (c) Pancreatic juice (d) Saliva (e) synovial fluid

25. A constituent of the exhaust gases of motor vehicles which causes serious air pollution is----

    a) Water vapour (b) Carbon dioxide (c) Oxygen (d) Carbon monoxide (e) Ozone

26. The following are the major causes of water pollution except?

    a) Refuse (b) Crude oil spillage (c) Industrial wastes (d) Sewage (e) Smoke

27. Which of the following pairs is the most effective measure in checking massive erosion of a steep slope?

    a) Construction of dam and contour farming
    b) Strip cropping and contour farming
    c) Contour farming only
    d) Terracing and planting of trees
    e) Terracing and strip cropping

28. A source of pollution which affects land and sea is

    a) Application of fertilizers on farmlands

b) Burning of waste

c) Bush burning

d) Oil spillage

e) Use of chemical in fishing

29. The part human alimentary canal where food is chewed is the

a) anus (b) large intestine (c) mouth (d) stomach (e) small intestine

30. Floods can be controlled by the following except?

a) Building high walls to check overflow

b) Building of high bridges (c) Building of reservoirs

d) Diversion of streams

e) Widening of the river

APPENDIX D

MARKING GUIDE

1. A
2. D
3. B
4. A
5. E
6. D
7. C
8. A
9. D
10. D
11. B
12. A
13. A
14. C
15. C
16. B
17. D
18. A
19. C
20. B
21. D
22. E
23. A
24. E
25. D
26. E
27. C
28. D
29. C
30. B

APPENDIX E

Basic Science Curriculum Implementation Process Questionnaire (BSCIPQ)

Letter to Respondent

School of Post-Graduate Studies,
Faculty of Education,
University of Nigeria Nsukka.
July, 2014.

Dear Respondent,

Request for Completion of Questionnaire

I am a post graduate student of the above named institution. This questionnaire is designed to elicit information that will be used for carrying out a study aimed at evaluation the implementation of Basic Science Curriculum (BSC) in junior secondary schools in Enugu State.

You are please requested to assist the researcher accomplish this task by responding honestly and objectively to the attached questionnaire items. Every information supplied will be treated as confidential and will be used specifically and only for the purpose of this study.

Thanks for your anticipated co-operation.

Yours faithfully,

Chukwunta Regina Ugochi
(Researcher)

THE QUESTIONNAIRE

Part one: GENERAL INFORMATION

Please indicate with a tick (√) in the boxes provided, the demographic data that best apply to you.

1. Gender Male ☐ Female ☐
2. Name of School ……
3. Class taught JS1 ☐ JSII ☐ JSIII ☐
4. Local Government Area of School ……
5. Highest qualification.

   (a)TC11 ☐ (b) NCE ☐ (c) B.Ed ☐ (d) BSC ☐

   (e) BSC Ed ☐ (f) PGDE ☐ (g) M.Ed ☐ (h)MSC ☐ (i) Ph.D ☐

Part two

Questionnaire on Extent of Achievement of Basic Science Objectives (QEASCO)

Instructions: tick against the option that best describes the extent of achievement of the objectives of Basic science curriculum

Note; VHE= Very high extent, HE= High extent, LE= Low extent, VLE= Very low extent

S/NO	ITEM STATEMENT	VHE	HE	LE	VLE
1	I teach with appropriate instructional materials to enable the students develop interest in Basic Science				
2	I expose students to practical classes which aids in the achievement of curriculum objectives				
3	I teach students basic knowledge and skills in Basic Science to help them think and reason in a logical manner				
4	I always get prepared for the Basic Science lesson to enable the students develop more interest in science				
5	I try to cover the scheme of work to enable the students acquire more knowledge in Basic Science				
6	I expose students to development of interest in science by giving them constant assignments				
7	I encourage students to take advantage of the numerous career opportunities offered by the study of science such as in Medicine,				

	Pharmacy, Engineering etc which helps in the achievement of curriculum objectives				
8	I inculcate in the students the spirit of preparedness for further studies in science which will help in the achievement of the objectives				
9	I instill in the students the development of survival strategies that will enable them learn to live effectively within the global community				
10	I promote learning by doing and skill development in the students which aids in the realization of the objectives of Basic science.				

Checklist on Available Facilities for Teaching Basic Science in School (CAFTBSS)

Availability

s/no	Basic science facilities	Available	Not Available
1	Basic science laboratory		
2	Wall charts		
3	Models		
4	Measuring cylinder		
5	Beakers		
6	Test tubes		
7	Test tube holders		
8	Test tube rack		
9	Pictures		
10	Films		
11	Wheels and axle		
12	Connecting wires		
13	Iron rod		
14	Painted cans		
15	Preserved animal specimens		
16	Specimen of crude oil		
17	Cork		
18	Bunsen burner		
19	Conical flasks		
20	Thermometer		
21	Indicators		
22	Tripod stand		
23	Funnels		
24	Filter papers		
25	Retort stand and clamp		
26	Meter rule		
27	Stop watch		
28	Tongs of magnesium ribbon		

29	Safety goggles		
30	Spring balance		
31	Dissecting board		
32	Evaporating flask		
33	Evaporating dish		
34	Magnifier		
35	Pulley		
36	Spatula		
37	Wire gauze		
38	Stove		
39	Screw driver		
40	Gear		
41	Car jack		
42	Scissors		
43	Battery		
44	Torch bulbs		
45	Fuses		
46	Science text books		
47	Microscope		
48	Reagent bottles		
49	Petri dishes		
50	Fehling's solution		
51	iodine solution		
52	Millions reagent		
53	Biuret's reagent		
54	Soil samples		

Checklist on Functional Facilities for Teaching Basic Science in School (CFFTBSS)

s/no	Item statements	Functional	Not Functional
1	Basic science laboratory		
2	Wall charts		
3	Models		
4	Measuring cylinder		
5	Beakers		
6	Test tubes		
7	Test tube holders		
8	Test tube rack		

9	Pictures		
10	Films		
11	Wheels and axle		
12	Connecting wires		
13	Iron rod		
14	Painted cans		
15	Preserved animal specimens		
16	Specimen of crude oil		
17	Cork		
18	Bunsen burner		
19	Conical flasks		
20	Thermometer		
21	Indicators		
22	Tripod stand		
23	Funnels		
24	Filter papers		
25	Retort stand and clamp		
26	Meter rule		
27	Stop watch		
28	Tongs of magnesium ribbon		
29	Safety goggles		
30	Spring balance		
31	Dissecting board		
32	Evaporating flask		
33	Evaporating dish		
34	Magnifier		
35	Pulley		
36	Spatula		
37	Wire gauze		
38	Stove		

39	Screw driver		
40	Gear		
41	Car jack		
42	Scissors		
43	Battery		
44	Torch bulbs		
45	Fuses		
46	Science text books		
47	Microscope		
48	Reagent bottles		
49	Petri dishes		
50	Fehling's solution		
51	iodine solution		
52	Millions reagent		
53	Biuret's reagent		
54	Soil samples		

Questionnaire on Utilization of Facilities for Teaching Basic Science (QUFTBS)

s/no	Item Statement	Very often	Sometimes	Rarely	Not at all
1	Basic science laboratory				
2	Wall charts				
3	Models				
4	Measuring cylinder				
5	Beakers				
6	Test tubes				
7	Test tube holders				
8	Test tube rack				
9	Pictures				
10	Films				

11	Wheels and axle				
12	Connecting wires				
13	Iron rod				
14	Painted cans				
15	Preserved animal specimens				
16	Specimen of crude oil				
17	Cork				
18	Bunsen burner				
19	Conical flasks				
20	Thermometer				
21	Indicators				
22	Tripod stand				
23	Funnels				
24	Filter papers				
25	Retort stand and clamp				
26	Meter rule				
27	Stop watch				
28	Tongs of magnesium ribbon				
29	Safety goggles				
30	Spring balance				
31	Dissecting board				
32	Evaporating flask				
33	Evaporating dish				
34	Magnifier				
35	Pulley				
36	Spatula				
37	Wire gauze				
38	Stove				
39	Screw driver				
40	Gear				

41	Car jack				
42	Scissors				
43	Battery				
44	Torch bulbs				
45	Fuses				
46	Science text books				
47	Microscope				
48	Reagent bottles				
49	Petri dishes				
50	Fehling's solution				
51	iodine solution				
52	Millions reagent				
53	Biuret's reagent				
54	Soil samples				

Methods of Teaching Basic Science

What method(s) do you employ in teaching basic science and how often do you employ it/them?

s/no	Teaching method	Method employed	Rate of usage			
			Always	Often	Rarely	Never
1	Lecture					
2	Demonstration					
3	Project					
4	Field trip					
5	Guided inquiry (discovery)					
6	Discussion					
7	Process based learning					
8	Active learning approach					
9	Brain storming					
10	Team teaching					
11	Scaffolding method					

12	Computer assisted learning					
13	Simulation and games					
14	Experimental method					
15	Problem solving					
16	Cooperative learning					
17	Use of Analogy					
18	Concept Mapping					
19	Focus Group Discussion					

Cluster (D): Evaluation Techniques.

Identify by ticking (√) in the space provided the different ways you evaluate Basic Science lesson.

s/no	Evaluation Techniques	Rating Scale			
		High extent	Moderate extent	Low extent	Not used
1	Written test (Essay and Objective)				
2	Oral test (questions)				
3	Project (Team & individual Work Report)				
4	Observation report eg interview				
5	Practical test				

Problems of Implementation

Please indicate the degree to which you accept or reject these items as problems facing basic science curricular implementation

Note: SA= Strongly Agree, A=Agree, D= Disagree, SD= Strongly Disagree

S/NO	**ITEMS**	**SA**	**A**	**D**	**SD**
1	Some Basic Science teachers do not have the necessary qualification to teach Basic Science				
2	Some qualified teachers are not properly trained lacking good knowledge of the content and skills required for the				

	implementation of Basic Science curriculum				
3	Strike action due to non- payment of salaries, allowances and non- promotion of teachers				
4	Teaching periods for Basic Science is too small				
5	Use of lecture method ie talk chalk approach all the time in teaching Basic Science lessons				
6	Students – teacher ratio exceeding 40:1				
7	Use of innovative and brain tasking approach in teaching Basic Science				
8	Some parents prefer the education of male children to that of female children				
9	Some cultural belief breeds segregation between male and female learners being together in the classroom				
10	Sexual harassment on the part of the female learners leading to low class performance/ achievement or even total withdrawal from school				
11	No in-service training, workshops and seminars provided for Basic Science teachers to update their knowledge				
12	Incentives are not given to Basic Science teachers to enhance their performance				
13	Non- availability of classrooms and Basic Science laboratory in schools				
14	Non availability or inadequate teaching materials / laboratory facilities for teaching Basic Science				
15	Inability to utilize the available Basic Science facilities by teachers				
16	Inadequate funding / budgetary allocation for Basic Science teaching				
17	Inability to improvise on the part of the Basic Science teachers to ensure effective teaching / learning				
18	Host communities do not support the school in providing the basic facilities for the teaching of Basic Science				
19	Non –monitoring of Basic Science teachers on the part of Ministry of Education.				

APPENDIX F

Scores for Computation of Reliability co-efficient BSAT (K-R21)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
VAR00001	40	4.00	28.00	15.8000	6.83205	46.677
Valid N (listwise)	40					

Using Kudder Richardson R_{21} Formula

$$K\text{-}R_{21}: r_{xx} = \frac{n}{n-1}\left[1 - \frac{\bar{X}(n-\bar{X})}{nS_x^2}\right]$$

$n = 40$

$\bar{X} = 15.80$

$nS_x^2 = 46.68$

$$\frac{40}{39}$$

1.025641025641

40 – 15.8

24.2

40 · (46.68)

1867.2

$$\frac{24.2}{1867.2}$$

$$\frac{121}{9336}$$

0.0129605826907

0.0129605826907 · (15.8)

0.20477720651306

0.2047772065131

1 – 0.2047772065131

0.7952227934869

1.025641025641 · (0.7952227934869)

0.815613121525250052506976029

0.815613121525

APPENDIX G

RELIABILITY COMPUTATION USING CRONBACH ALPH FOR BSCIPQ

```
GET
  FILE='C:\Users\CHRIS\Documents\EzeAfam 2.sav'.
DATASET NAME DataSet7 WINDOW=FRONT.
DATASET CLOSE DataSet6.
DATASET ACTIVATE DataSet1.
RELIABILITY
  /VARIABLES=Item1 Item2 Item3 Item4 Item5 Item6 Item7 Item8 Item9 Item10
  /SCALE('ALL VARIABLES')  ALL/MODEL=ALPHA.
```

Reliability

```
[DataSet1] C:\Users\CHRIS\Documents\Chukwunnta.sav
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded(a)	0	.0
	Total	40	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.792	10

```
RELIABILITY
  /VARIABLES=Item11 Item12 Item13 Item14 Item15 Item16 Item17 Item18 Item19
  Item20 Item21 Item22 Item23 Item24 Item25 Item26 Item27 Item28 Item29
  /SCALE('ALL VARIABLES')  ALL/MODEL=ALPHA.
```

Reliability

```
[DataSet1] C:\Users\CHRIS\Documents\Chukwunnta.sav
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded(a)	0	.0
	Total	40	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.904	19

```
RELIABILITY
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  /SCALE('ALL VARIABLES')  ALL/MODEL=ALPHA.
```

Reliability

```
[DataSet1] C:\Users\CHRIS\Documents\Chukwunnta.sav
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded(a)	0	.0
	Total	40	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.656	5

```
RELIABILITY
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  Item44 Item45 Item46 Item47 Item48 Item49 Item50 Item51 Item52 Item53
  /SCALE('ALL VARIABLES')  ALL/MODEL=ALPHA.
```

Reliability

```
[DataSet1] C:\Users\CHRIS\Documents\Chukwunnta.sav
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded(a)	0	.0
	Total	40	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.904	19

```
RELIABILITY
  /VARIABLES=Item1 Item2 Item3 Item4 Item5 Item6 Item7 Item8 Item9 Item10
  Item11 Item12 Item13 Item14 Item15 Item16 Item17 Item18 Item19 Item20
  Item21 Item22 Item23 Item24 Item25 Item26 Item27 Item28 Item29 Item30
  Item31 Item32 Item33 Item34 Item35 Item36 Item37 Item38 Item39 Item40
  Item41 Item42 Item43 Item44 Item45 Item46 Item47 Item48 Item49 Item50
  Item51 Item52 Item53
  /SCALE('ALL VARIABLES')  ALL/MODEL=ALPHA.
```

Reliability

```
[DataSet1] C:\Users\CHRIS\Documents\Chukwunnta.sav
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded(a)	0	.0
	Total	40	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.957	53