

## Science Education in Primary School Education in Nigeria: Problems and the way Forward

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**Abstract:** Science education is one of the education offer in the Nigerian educational system. Science education starts from primary school till higher education in Nigeria. Science education in the Primary school education in Nigeria is plagued with many problems. This paper is aimed to discuss the problems facing science education in the Nigerian primary schools. To do this, secondary data were sorted and used to support the various points raised in the paper. The secondary data were sourced from online publication and print materials. This paper concluded that inadequate funding, shortage of science teachers, inadequate infrastructural facilities, shortage of instructional materials, Negative attitude of students towards Science education, lack of motivation for science teachers, outdated curriculum are the problems facing science education in the Nigerian primary school. To address these problems, the paper suggested that the Federal, States and Local government should increase the funding of science programme in the primary school education in Nigeria and provide all the materials and human resources needed for the implementation of the programme at the school level. More Science teachers should be employed and deploy to the primary schools across the country and government should provide adequate infrastructural facilities in all primary school schools in Nigeria etc.

**Keywords:** Science, Programme, Education

### 1. Introduction

Basic Education is the education given to children aged 0-15 years. It encompasses the Early Child Care and Development Education (0-4) and 10 years of formal schooling. Early Child Care and Development Education however is segmented into ages 0-4 years, situated in daycare or creches, fully in the hands of the private sector and social development services, whilst ages 5-6 are within the formal education sector. Basic Education, to be provided by Government, shall be compulsory, free, universal and qualitative. It comprises: 1-year of Pre-Primary, 6 years of Primary and 3 years of Junior Secondary Education. The primary school education is one of the component of basic education. The National policy on education (2014) defines primary Education as the education given to children aged 6 — 12 years. Osiesi, (2020), observed that primary education, globally, is the basis of formal education. It is the thread that connects other higher levels of learning, developing in young minds the very skills, experiences and knowledge for a tougher and higher pursuit in academics. Through primary education, the art and act of writing, reading, acquisition of necessary skills, attitudes and the basic information needed for appropriate adjustment into the society and the world in general is imbibed. This level of education is paramount to the core advancement of many economies, a reason for its inclusion into the Millennium Development Goals of the universal primary education. Various problems ranging from insecurity, illiteracy, religious violence, ignorance and political servitude in Nigeria for example, can be curbed or eradicated by the aid of primary education. This has caused most governments (Nigeria included) to make primary education free and declare it universal and compulsory (Kubiat, 2018).

The functions/importance of primary education across Nigeria is: To help learners master the art of writing, reading and Arithmetic; To help learners develop and be of good conduct and behavior, to help learners in acquiring vital skills and appreciate the worth of manual labour (Osiesi, 2020). The objectives of primary education according to National policy on education (2014), are to: Inculcate permanent literacy, numeracy and the ability to communicate effectively; lay a sound basis for scientific, critical and reflective thinking; promote patriotism, fairness, understanding and national unity; .instill social, moral norms and values in the child; .develop in the child the ability to adapt to the changing environment; and Provide opportunities for the child to develop life

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manipulative skills that will enable the child function effectively in the society within the limits of the child's capability. In pursuance of these objectives: Primary education shall be compulsory, free, universal and qualitative; and curriculum for primary education shall be as follows: primary 1-3 and 4 to 6. Science subjects are among the subjects offered in the Nigerian primary schools (NPE, 2014). The science subjects include; Mathematics, Basic Science and Technology, Basic Science, Basic Technology, Information Technology and Physical and Health Education.

The science subjects or programme are unique programme that are meant to the develop the scientific skills and knowledge of the students. The teaching of sciences is vital to the social, economic and technological advancement of the country. Science programme are offer in the all the phases of educational institutions in Nigeria from the basic education to the higher institutions. The primary school education is the foundation education designed to prepare the learners holistic education that covers science education. It is unfortunate that the teaching of science education in Nigerian primary schools is faced with many problems. Emechebe, (2012), observed that there are no shortcomings in science education, good knowledge of science principles and facts are vital for a comprehensive education. Although there has been tremendous increase in the net enrolment of learners, the question is whether this increase has translated to qualitative education. This paper will discuss the problems facing the teaching of science education in the Nigerian primary schools.

## 2. Concept of Science Programme

The science subject offered in the Nigerian primary schools include; Mathematics, Basic Science and Technology, Basic Science, Basic Technology, Information Technology and Physical and Health Education. They are referred as science subject because they are scientifically inclined and they are designed to help instill on the young children science knowledge and skills to able to contribute positively to the social, economic and technological development of the country. Ezechi & Ogbu (2017), and Akpan, (2012), submitted that Science was first introduced in Nigerian schools in 1859 and from that time to the present time, emphasis has shifted from science as a mere subject in the school curriculum to its use as the vehicle towards national economic development. It is to this effect that we need to educate all young people to be scientifically literate citizens. Ogunode (2020) and Agbowuro & Joseph (2014), observed that Science education promotes intellectual respect for Mother Nature. This action can inform choices with regard to how technology is used to enhance the current living conditions for humans and other living things while Ezechi & Ogbu (2017), and Eze and Oluba (2010), listed five main objectives of teaching science to the youths which include training the youths; to be able to observe, measure, record, collect, analyze data, hypothesize and predict data and events in an accurate and honest manner, these are the scientific skills necessary for further work in science later in life, to acquire the ethics of science which include honesty, skepticism, perseverance, objectivity, rationality etc, to give the youths sufficient doses of scientific literacy capable of preparing them for some worthwhile vocations in the fields of science and technology, to groom a preponderant number of youths for future adult roles by equipping them with skills and competence to identify societal issues and problems and possible resolutions of such socio-scientific and technological problem, to produce a scientifically literate populace, some of when will be professional scientists and technologists while others will be well informed, attentive citizens whose daily activities are guided by the products, ethics and processes they have acquired.

Harry, (2011), noted that Science education encourages learners to reason critically so as to make decisions that are well informed. Agbowuro & Joseph (2014), observed that the search, collaboration, reporting and communication skills provided by science education can yield a whole generation of people who are more prepared for their careers, such people can make better contributions to the society. Furthermore, learners who have an in-depth knowledge in science education are more willing to use new ideas and technologies that can enhance and strengthen the economy. Through explaining and emphasizing the reliance of living organisms on one another and also on the environment, science education promotes intellectual respect for Mother Nature, This action can inform choice with regards to how technology is used to enhance the current living conditions for both humans and other living things.

The achievement that came about due to science education have resulted in longer and healthier lives. People who understand and honor or celebrate past scientific achievement are more likely to herald future inventions and discoveries that will enhance mental and physical health, beside, a healthier general public means a highly productive society. Science education encourages learners to reason critically so as to make better decisions that are well – informed. This makes them even more enlightened voters. The caution and responsibility provided by science education also assists people to become more responsible parents. There are no shortcomings of science education (Agbowuro & Joseph 2014).

### 3. Problems Facing Science Education in Primary schools in Nigeria

Inadequate funding, shortage of science teachers, inadequate infrastructural facilities, shortage of instructional materials, Negative attitude of students towards science education, lack of motivation for science teachers and outdated curriculum and poor capacity development programme will be discussed as the problems facing science education in the primary schools in Nigeria.

#### 3.1 Inadequate funding

Inadequate funding is a major problem responsible for poor development of science education. Science education is very expensive and cost effective. The annual budgetary allocation for the primary school education is inadequate. Science programme in the primary school drives their funds from the general budget of the primary school education. Ogunode (2021) submitted that basic education receives the least budgetary allocation in Nigeria and this is affecting the development of basic education in Nigeria. Ezechi & Ogbu (2017), submitted that funding science programmes and science related research has been a major problem facing technological growth and self-reliance in Nigeria. Government do not adequately fund science and science related programme and research. In addition to this, the little fund provided relapse and are embezzled by top officials in charge of its implementation.

#### 3.2 Shortage of Science Teachers

Shortage of science teachers is one of the major challenge facing the development of science education in the Nigerian primary schools. Inadequate professional teachers have been identified as a major problem facing the basic education by Ogunode (2020). Ogunode (2020) did a study with the aims of investigating the challenges facing the administration of STEM Education in Gwagwalada junior secondary schools of FCT, Nigeria. The study revealed that challenges are facing the administrations of STEM Education in Gwagwalada junior secondary schools and these challenges include; shortage of science teachers, inadequate infrastructural facilities, lack of instructional materials, lack of motivation, inadequate fund, poor supervision, high population, poor capacity development program for science teachers and negative attitude of students towards STEM education. The result also revealed that 100% of the respondents agreed that the implications of the challenge facing the administration of STEM Education are responsible for poor implementation of STEM education in Gwagwalada junior secondary schools of FCT, Nigeria.

#### 3.3 Inadequate Infrastructural Facilities

Inadequate infrastructural facilities is a major problem hindering the growth and development of science education in the Nigerian primary schools. Ogunode & James (2021) viewed infrastructural facilities as social capital within the school environment. They include school buildings/complexes such as classrooms, tables, exam hall, chairs, auditoria, desks, staff offices, seminar/conference/board rooms, laboratories, workshops, studios, farms, gymnasia, central libraries, specialized/professional libraries, faculty libraries, departmental libraries, etc., Institute/centers' specialized facilities e.g. ICT infrastructure, special laboratories, conference facilities, etc., and Boards e.g. interactive, magnetic, screen and chalk, etc., ICT that is computer laboratories and services, network connectivity, multi-media system, public address system, slide, and video projectors, and Ergonomics furnishing in laboratories, libraries, and lecture rooms/theaters, moot courts, and studios, etc. Students' hotels or accommodation include Boys and Girls hostels; municipal/physical infrastructure i.e. power supply, water supply, good road networks, sports, health and sanitation, staff schools, security facilities, etc. Ogunode & James (2021), also observed that the importance of infrastructural facilities in educational institutions include: It aids effective delivery of administrative functions in schools; it makes the delivery of services fast and reliable; it enables teachers to deliver lessons fast; infrastructural facilities provide a conducive working environment for both teachers and students; infrastructural facilities enable learners to learn at ease and learn well; infrastructural facilities enable the teachers to teach well, prepare their lessons, and deliver them online (ICT). The importance of school infrastructural facilities in the realization of educational goals cannot be underestimated. School facilities aid the delivery of the teaching and learning process in the schools. The school offices provide a conducive working environment for teachers, the classrooms help the learners to learn while the school fence protects students, the teachers, and school administrators from criminals. These infrastructural facilities are inadequate in many primary schools in Nigeria (Ogunode, 2020). Laboratories is an important segment of school facility that is another problem hindering effective teaching of science education in the Nigerian primary schools. Laboratories are specialized room or hall designed for carrying or conducting practical with the aims of inculcate science skills and knowledge to the students. Laboratories are social capital that aids the teaching of science education. It is unfortunate that as important as the laboratories to the development of science education in the educational institutions that many public primary schools do not have adequate laboratories. This submission is attested to by Ezechi & Ogbu (2017), who submitted that majority of Nigerian schools lack laboratory spaces, those who have spaces lack equipments and

necessary infrastructure for proper teaching and learning of science. Science therefore is not miracle where something happen out of nothing.

### 3.4 Shortage of Instructional Materials

Shortage of instructional materials is a very big problem preventing effective teaching of science education in the primary schools across the country. Instructional materials is vital to the development of science education. Instructional materials provide the science teachers to teach well and students to understand more. Mkpa (1989), opines that children at the junior secondary school level are often young learners who require to be stimulated to learn through a variety of instructional materials. Opara & Etukudo (2014), observed that the objectives of basic science may not be attained without the availability and use of adequate instructional materials. Akubue (1993), posits that with the use of instructional materials, the teacher will be able to give students the chance to learn through their senses of hearing, smelling, tasting, seeing and feeling. Opara & Etukudo (2014), did a study with the purpose of investigating into the factors that affect teaching and learning of Basic Science and Technology in primary schools. The study revealed that most of the instructional materials were not available for teaching basic science in primary schools. The non-availability of material implies their non-utilization. Primary school administrators should encourage classroom teachers to produce and use instructional materials in teaching. Teachers should not wait for the Government to do everything, they should go extra mile in the provision of instructional materials for their pupils.

### 3.5 Negative Attitude of Students towards Science programme

Another problem facing the teaching and learning of science education in primary schools in Nigeria is the negative attitude of students toward science programme. Many students are afraid of science subjects like mathematics and Basic sciences. This submission is attested to by Ezechi & Ogbu (2017), who submitted that science knowledge is by nature abstract and theoretical. It is often developed through controlled experiments in artificial and “unnatural” and idealized laboratory settings. Learning science often requires hard work and intellectual efforts. Concentration and hard work is not part of present youth culture. In a world where so many “channels” compete about the attention of young people, such subject become untrendy. Ogunode (2020) and Abubakar, (2015) who discovered that majorities of students have a negative attitude towards science programs in secondary schools.

### 3.6 Lack of Motivation for Science Teachers

Science teachers are poorly motivated in the Nigerian educational institutions especially at the Basic schools. A Study was conducted by Ezechi (2016) and the result revealed that science teachers in Nigeria are not motivated. Science teachers are faced with poor condition of service, their salaries are not paid regularly, they are not given oped teachers’ performance in contributing towards learning. Ezechi & Ogbu (2017), observes that Teachers are the pivot on which educational process hang. They can influence the teaching/learning outcomes either positively or negatively because they determine the quality of instructional delivery and also influence the quality of Education when it comes to implementation of the curriculum and educational policies. Teachers are to be considered when addressing issues such as quality assurance, qualitative delivery (teaching), quality context and quality learning outcomes (Onucha, 2002). Adelabu (2005), found in Nigeria that teacher's motivation is very poor and teachers are also dissatisfied with their working environment and salary conditions. The reason behind the poor motivation of teachers is that they having low salaries as compared to other professionals, poor work environment, no decision making authority, and also not allowing them to develop their career

### 3.7 Outdated Curriculum

Another problem facing the teaching and learning of science education in the Nigerian Primary school education is the poor development of curriculum. The curriculum for the science programme are not innovative and creative. This submission is confirmed by Ezechi & Ogbu (2017), who submitted that many studies show that students perceive school science as lacking relevance. It is often described as dull, authoritarian, abstract and theoretical. The curriculum is often overcrowded with unfamiliar concepts and law. The curriculum is intensive with insufficient time allocation for Science Education. It leaves little room for enjoyment, curiosity and searching for meaning. It often lacks a cultural, social and historical dimension and it seldom treats the contemporary issues.

### 3.8 Poor Capacity Development Programme

Poor capacity development programme of science teachers in Nigerian primary schools is another fundamental problem affecting the development of science education at that level. The national policy on education (2013), states that” no educational system may rise above the quality of its teachers.” This is in tandem with the National Policy on Education which stated that the purpose of teacher education is to produce highly motivated, conscientious and effective classroom teachers while boosting the spirit of creativity and enquiry and assisting them to adapt the current societal



ways of life; making available teachers with sound professional and intellectual background which will be applicable in their daily teaching obligations and ensuring their adaptability in an ever changing society and the world at large and to enhance their commitment to the teaching profession. Kolo (2009), observed that teachers fundamentally need a continued and lifelong learning as to be able to shoulder their duties in and outside the classroom and be capable of positively inducing pupils' behaviours, way of life and the way they think. Similarly, Jokthan (2012), suggests: Teachers are expected to be prospectors, inspirers, critics and appreciators of excellence and enemies of shoddiness. It is sadden to know that science teachers in the Nigerian primary schools are not constantly going for training. Ogunode, Adah, Audu & Pajo (2020) submitted that the primary school teachers in Nigeria do not enjoy staff development programme as planned by the federal, states and local government authorities due to many challenges. Some of the challenges include; inadequate funding, lack of strategic plans, poor implementation of staff development policies, institutional corruption, poor internal school administration of staff development programme for teachers, unstable educational policies, political instability and lack of data/information on training need gaps of schools (Ogunode, Adah, Audu & Pajo 2020). Abubakar, (2015) who submitted that teachers in Nigeria lack capacity development programme for effective teaching in the school.

#### 4. Way Forward

The following recommendations were suggested for the development of science education at the primary schools in Nigeria:

1. The federal, states and local government should increase the funding of science programme in the primary school education in Nigeria. This will help to provide all the materials and human resources needed for the implementation of the programme at the school level.
2. More Science teachers should be employed and deploy to the primary schools across the country.
3. The government should provide adequate infrastructural facilities in all primary school schools in Nigeria. Primary schools should be provided with more and well equipped science teaching and research infrastructures like computers, office space, classroom space and laboratories. Stakeholders in Education like UNICEF, UNESCO, Religious bodies and private individual should help to provide science laboratories in various primary schools.
4. The government should provide adequate instructional materials in all primary school schools in Nigeria.
5. Science clubs and societies should be on ground to encourage the children to offer the science subjects.
6. Science teachers should be motivated by increasing their salaries and make provision for other allowances to boost their moral. Science teachers' salary should be regular. They should also be paid approved science allowance.
7. Science clubs and societies should be on ground to encourage the children to offer the science subjects.
8. The government should ensure that science curriculum of Primary schools are reviewed regularly.
9. Training and retraining of science teachers should be done regularly to improve the knowledge and skills of the teachers. The Science Teachers Association of Nigeria (STAN) can organize seminars, workshops and conferences for serving science teachers. This can be done by providing subventions to STAN enabling the association enrich its seminars and workshops.

#### Conclusion

In conclusion, science education is vital to the social, economic and technological advancement of Nigeria. The foundation of science education is crucial to the development of science in the post-primary school education. This paper discussed the problems facing science education in the primary schools in Nigeria. Problems like inadequate funding, shortage of science teachers, inadequate infrastructural facilities, shortage of instructional materials, negative attitude of students towards Science education, lack of motivation for science teachers, outdated curriculum were identified. To address these problems, the paper suggested that the Federal, States and Local government should increase the funding of science programme in the primary school education in Nigeria and provide all the materials and human resources needed for the implementation of the programme at the school level. More Science teachers should be employed and deploy to the primary schools across the country and government should provide adequate infrastructural facilities in all primary school schools in Nigeria etc.

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