A Review of Problems Facing Science Education in Basic Education in Nigeria and Way Forward

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Abstract: Science education at the basic education is key to the development of science education in the future. The foundation of science education matters a lot in the development of science programme. Science education at the basic education in Nigeria is plagued with many problems. This paper intends to discuss the problems militating against effective teaching and learning of science education at the basic schools in Nigeria. Primary and Secondary data were used to provide empirical support for the points raised in the paper. The secondary data were sourced from print materials and online resources. The paper concluded that inadequate funding, shortage of science teachers, shortage of infrastructural facilities, corruption, lack of instructional materials and poor capacity building and insecurity problems were identified the problems militating against effective teaching and learning of science education at the basic schools in Nigeria. To address this problems, the paper among other things, recommended that the government at every level 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.

Keywords: Basic School, Education, Science Programme, School.

Introduction

The Universal Basic Education (UBE) programme is a nine year basic educational programme, which was launched and executed by the government and people of the Federal Republic of Nigeria to eradicate illiteracy, ignorance, poverty as well as stimulate and accelerate national development, political consciousness and national integration. Former president Olusegun Obasanjo flagged off the UBE programme on the 30th of September 1999 in Sokoto, Sokoto State. The UBE programme in Nigeria is a strategy for the achievement of Education for all (EFA) and the education related Millennium Development Goals (MDGs). The implementation process of the programme has been ongoing since 1999 but progress was hampered by lack of an enabling law to execute certain aspects of the programme. What a big relief it was when the president signed the UBE Bill into law on the 26th of May 2004 following its passage by the National Assembly. The UBE Act 2004 makes provision for basic education comprising of Early Childhood Care Education (ECCE) Primary and Junior Secondary Education (Christine & Joseph, 2014).

The UBE programme has laudable and specific objectives. These according to the Federal Republic of Nigeria (FRN, 1999) are to:

1. Develop in the entire citizenry a strong consciousness for education and a strong commitment to its vigorous promotion;
2. Provide free, compulsory Universal Basic Education for every Nigerian child of school-going age;
3. Reduce drastically, dropout rate from the formal school system through improved relevance and efficiency;
4. Cater for dropouts and out-of-school children/adolescents the provision and promotion of basic education;
5. Ensure the acquisition of the appropriate levels of literacy, numeracy, manipulative and life skills (as well as the ethical, moral and civic values) needed for laying the foundation for life-long learning;
6. Ensure unfettered access to nine years of formal basic education;
7. The provision of free, universal Basic Education (FUBE) for every Nigerian child of school-going age;
8. Reducing drastically the incidence of drop-out from the formal school system through improved, relevant, quality and efficient educational system.
9. Ensuring the acquisition of appropriate levels of literacy, numeracy, manipulative, communicative and life skills as well as the ethical, moral and civic values needed for laying a solid foundation for life-long learning (Christine & Joseph, 2014). The science subjects include; Mathematics, Basic Science and Technology, Basic Science, Basic Technology, Information Technology and Physical and Health Education. Ahmed, Ajemba & Ogunode (2021) observed that 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. This paper will discuss the problems facing the teaching of science education in the Nigerian primary schools.

Concept of Science Education

Science education is one of the basic education offered in the Nigerian basic schools. It is a major subject for the children. It is meant to stimulate their interest in science education. Ahmed, Ajemba & Ogunode (2021) observed that 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.

The main aims of teaching science to the youths according Ezechi & Ogbu (2017), and Eze and Oluba (2010) 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 will become 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.
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.

Ahmed, Ajemba & Ogunode (2021) opined that the science subjects or programme are unique programme that are meant to 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 all the phases of educational institutions in Nigeria from the basic education to the higher institutions.

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 choices 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).

**Problems Facing Science Education in Basic Schools in Nigeria**

There are many problems facing the teaching and learning of science education at the Basic schools in Nigeria. Some of these problems include; inadequate funding, shortage of science teachers, shortage of infrastructural facilities, corruption, lack of instructional materials and poor capacity building and insecurity problems.

**Inadequate Funding**

Inadequate funding is a challenge to the teaching and learning of science education in the Nigeria basic schools. Funding is critical to the implementation of science programme because of the cost implication of the resources. Annual budgetary allocation for the implementation of science programme in the basic schools is not adequate. This submission is confirmed by Ahmed, Ajemba & Ogunode (2021) who noted that 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. Also Ezechi & Ogbu (2017), reaffirmed the problem they 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. Ogunode (2021) noted that basic education receives the least budgetary allocation in Nigeria and this is affecting the development of basic education in Nigeria.

**Inadequate of Science Teachers**

Another major problem facing teaching and learning of science education at the basic schools in
Nigeria is the problem of inadequate sciences teachers. It has been observed that many basic schools across the country do not have professional science teachers. Some of the teachers delegated to teach science related subjects are not qualified science teachers. The success of science education to some extent depend on the quality of science teachers available. Ahmed, Ajemba & Ogunode (2021) noted that 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 facing the administrations of STEM Education in Gwagwalada junior secondary schools include; shortage of science teachers and other problems. Generally, Nigerian basic schools are faced with the problem of shortage of teachers. The 2018 National Personnel Audit (NPA), conducted by the Universal Basic Education Commission (UBEC), reported, there was a deficit of 135,319 teachers at the Early Childhood Care Development Education, 139,772 deficit in primary schools and 2,446 shortage in Junior Secondary Schools across the nation (Independent newspaper, 2019). Many public primary schools in the country do not have adequate professional teachers due to the high rate of corruption in the administration. The problem of shortage of teachers in basic schools was linked to corruption by Ogunode & Shofoyeke (2021). They observed that there are many corrupt practices responsible for the shortage of professional teachers in the public primary school across the country. Funds diversion is one of the factor, the money released for the recruitment of qualified teachers and other human resources services are diverted by some officials and political officeholders. Another corrupt practices in the educational administration that is responsible for shortage of teachers is the problem of ghost workers. The ghost workers syndrome is another factor responsible for shortage of teachers in many primary schools in Nigeria. Ghost workers, is a situation where fake names are been used to collect salaries for teachers that are supposed to be employed in the school.

**Shortage of Infrastructural Facilities**

Infrastructural facilities are very important in the teaching and learning of science education. 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, gymnasium, 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. Laboratory among the facilities is special to the teaching and learning of sciences.

Ahmed, Ajemba & Ogunode (2021) noted that 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 & Ogbe (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.
Corruption

Ogunode (2020), opined that corrupt practices in the Nigerian educational institutions is another major challenge preventing the implementation of primary school policies in Nigeria. Funds meant for the purchase of science resources like books, instructional aids, chemicals and capital projects are been diverted by some officials in the administration and management of basic schools. Ogunode & Shofoyeke (2021) submitted that corruption in Nigeria is a hydra-headed and multi-facet problem that ramifies every sector of our national life and the education sector has not being innocent. Corruption have penetrated the Nigerian education system including the Basic education administration. They identified; shortage of funds, inadequate teachers, shortage of infrastructural facilities, poor quality of education, large out of school children, poor capacity development, poor implementation of Basic education policies and increase in the cost of Basic education administration as the effects of corruption on Basic education administration in Nigeria.

Lack of Instructional Materials

Instructional materials are educational resources to aid the teacher to teach well and make students understand better. Akubue (1993), posited 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. As important as these instructional materials to the implementation of science in the basic schools, it unfortunate to see that many public basic school do not have adequate instructional materials to deploy for the teaching of science programme. Ahmed, Ajemba & Ogunode (2021) concluded that 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. 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.

Poor Capacity Building Programme

Ahmed, Ajemba & Ogunode (2021) observed that 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. Ogunode & Shofoyeke (2021) linked the poor capacity building programme of basic school teachers to corruption. They submitted that poor capacity development programme of teachers in the primary school across the country is also caused by the high rate of administrative corruption in the system. Capacity development programme is meant to develop the teachers’ capacity in term of teaching methodologies and subject mastery. Capacity development programme is one of the
instrument for achieving quality education in the educational institutions. Due to the high rate of corruption in the administration of primary schools in Nigeria, the problem is poorly implemented because of corruption. Gift (2018a), submitted that in September 2018, Anum Iho, former chairman of the State Basic Education Board (SUBEB) – an offshoot of the Universal Basic Education Commission in the states, established to address the inequality in educational opportunity at the basic level and improving the quality of its provision – was sentenced to 12 years imprisonment for embezzling funds meant for the training of teachers in Benue State. Iho was found guilty of misappropriating N91.5 million (€220,000), and of taking a bribe of N14.9 million (over €36,000). 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 which 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.

**Insecurity**

Insecurity is another problem affecting the teaching and learning of science education in many basic schools across the country especially the North east and south east Nigeria. Many basic school have been closed down because of attacks from bandits, Boko haram members and Ipobs. Tribune newspaper reported that Nigeria had shut down more over 4,000 public primary schools across the state, and over 4,000 public secondary schools were among the closed down schools. According to paper, over 300,000 to 400,000 thousand students and pupils are at home after the incidence of Chibok school students’ kidnap without considering the effects on the internal administration of the school especially the learners (Tribune, 2021). Ogunode & Ahaotu (2021) submitted that the effects of closure of schools on school administration in Northern Nigeria include poor learning, poor quality of education, loss of interest in education and disruption of academic calendar and learning loss were identified as the effects of closure of schools on school administration in Northern Nigeria.

**Recommendations**

1. To solve the identified problems facing the teaching and learning of science education at the Basic education in Nigeria, the paper recommended the following:

2. The government at every level 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.

3. More Science teachers should be employed and deploy to the primary schools across the country.

4. 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.

5. The government should provide adequate instructional materials in all primary school schools in Nigeria.

6. 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.
7. The government should establish anti-corruption units in the ministries and agencies of education to help checkmate corrupt practices among staff.

8. Government at all levels should be more proactive in dealing with security situation in the country to ensure that incessant closure of schools leading to disruption of academic calendar is controlled and School premises and their surroundings should be secured adequately in order to guaranty the safety and security of lives and properties.

Conclusion

Science education is very important to the socio-economic and technological advancement of the country. The foundation of science programme in the educational institutions matters. Basic schools is where the basic element of the science should be taught well to provide a solid foundation for the children. It is unfortunate that teaching and learning of science education at the basic schools are faced with many problems. Inadequate funding, shortage of science teachers, shortage of infrastructural facilities, corruption, lack of instructional materials and poor capacity building and insecurity problems were identified as the problems mitigating against effective teaching and learning of science education at the basic schools in Nigeria. The government should increase the funding of science education at the basic schools, more instructional materials teachers and infrastructural facilities should be provided in all basic schools. The government should employ more science teachers and capacity building programme should be ensured for all science teachers.

References


