

## ENSURING QUALITY SCIENCE EDUCATION FOR SUSTAINABLE NATIONAL SECURITY AND DEVELOPMENT

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### Abstract

*Science education is an important key to achieving a sustainable national security and development, for any state or society to achieve a sustainable security and development then the quality of its science education programme should be improved. The development of skills, knowledge and competence through functional education is the main focus of science education. The purpose of this paper is aimed at providing strategies for ensuring quality and functional science education programme for sustainable national security and development. The paper adopted a literature review approach. It highlights the concepts of science education, quality education, quality science education, national security and sustainable development. It also discusses the importance of science education to sustainable national security and development, challenges hindering the development of science education in Nigeria as well as the strategies for confronting the problems. It was concluded that science education should be given adequate attention by the government so that sustainable national security and development can be ascertained. In view of this it was concluded that sustainable national security and development can only be achieved when quality and functional science education is delivered to the citizenry. It was then recommended among others that there should be recruitment of academically and professionally qualified science teachers by the government, setting of quality assurance units in all institutions of learning, proper monitoring and supervision, laboratory facilities should be well equipped as well as provision of funds by the government and stake holders in education for the training and retraining of science teachers.*

**Keywords:** Quality Education, Science Education, Quality Science Education, National Security, Sustainable Development.

### Introduction

Education is a crucial process that enables social, economic, and political development in a country. It empowers people and strengthens society, and high-quality education is essential for sustainable development. Science education, a branch of education, focuses on disseminating scientific knowledge and methods, aiming to change students' behavior by exposure to nature and natural phenomena. It is crucial for a country's growth and promotes sustainable national security and development. Science education has been instrumental in many developed nations' scientific and technological advancements. It emphasizes problem-solving and decision-making abilities to ensure effective development.

In Nigeria, the persistent violence and complex socioeconomic, political, and security issues are pressing problems. To address these issues, several actions must be implemented, including sustained literacy, quality and funding of science education, adequate medical facilities, food security, housing, respect for social justice, political stability, admirable social behavior, improved living standards, and a stable economy. Addressing these issues is essential for national security and development, as

advancement is impossible without a peaceful atmosphere.

Therefore goals of science education by the National policy on education include:

- i. To cultivate, inquiring knowledge and rational mind for the conduct of a good life and democracy.
- ii. Produce scientist for national development and
- iii. Service studies in technology and the cause of technological development.
- iv. Promote interest in science.
- v. Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life.

Science education is seen as an instrument per excellence for achieving MDGs (FRN in Boris, Adigun and Awodun, 2021).

### **Quality Education**

Quality is that thing that differentiates something; it is also the degree of goodness of a thing (Boris, Adigun & Awodun, 2021). Ahmed in Boris, Adigun and Awodun (2021) defined quality as the freedom from deficiencies. Quality is defined by advanced learner's dictionary as the level of excellence. Quality is considered as a baseline standard in education that can be measured on a scale of preference, standard, accepted principles, rules, guidelines or levels established by group of people, organizations or society.

Quality education is closely linked to accountability and the efficacy of educational systems. The efficiency of educational programs is often determined by the calibre of human resources, particularly instructors. Sufficient staffing, well-equipped classrooms, and a supportive teaching atmosphere are indicators of a high-quality education. Efficient instruction is the yardstick for 21st-century excellent education. High-quality education creates healthy, well-fed students who contribute to the country's economic revival. However, many graduates lack comprehensive understanding of their fields, leading to a decline in educational quality in Nigeria. Quality education equips students with the skills necessary to become economically productive, create sustainable livelihoods, and support democratic and peaceful communities. It also helps people evaluate environmental and developmental challenges and support sustainable development. Education and sustainable development (ESD) aims to prepare the younger generation for responsible citizenship and societal shaping.

### **Quality Science Education**

Quality science education is crucial for a nation's social, political, and economic development. Nigeria can improve its science education by making the curriculum dynamic and equipping graduates with necessary skills. These programs equip students with theoretical and practical knowledge, enabling them to face life challenges, become self-reliant, contribute to national development, and meet global challenges. Ensuring quality, relevant, and sustainable science education is essential for both scientific and non-scientific communities.

### **National Security**

National security is the ability of a nation to overcome challenges and ensure free movement among citizens without real or imaginary dangers. It is a condition of peace, stability, order, and progress, involving international economy and long-term national development goals. National security and development are symbolized by sustainable high literacy rates, quality science education, adequate medical facilities, food security, housing, and respect for social justice, political stability, commendable social behavior, improved standard of living, and a healthy economy. Nigeria faces significant security challenges such as political assassination, armed robbery, human trafficking, terrorism, and judicial killing of innocent citizens. The high unemployment rate in Nigeria is due to

government neglect in promoting quality and functional science education programs, which puts national security at risk. Addressing these issues is crucial for sustainable development and transforming society.

### **Causes of Insecurity**

Insecurity in Nigeria constitutes a major threat to the growth and development of the country. Though the country is highly blessed but the government is yet to prefer a lasting solution to the problem of insecurity. Some of the causes of insecurity according to Gabriel and Ibrahim (2023) are:

1. Corruption - Corruption of all kind ranging from bribery, fraud, nepotism, stealing of public property and embezzlement can lead to crisis which can in turn lead to insecurity of life and property.
2. Political instability - The instability of political system of governance in Nigeria can lead to insecurity of life of people and property.
3. Religious intolerance - This is a disagreement between two groups of different religion that struggle against coherent existence. Any doctrine that is against the principle of nationhood is likely to be a source of insecurity to the nation. In Nigeria most of the violence experienced on some parts of the country is linked to religious undertone and this can lead to lose of life and property.
4. Influx of fire arms - The selling of arms by smugglers at the borders of the country create insecurity problems because kidnapers, armed robbers and terrorists use the arms to destroy life and property of people.
5. Ethnicity issues - The diverse ethnic groups in Nigeria do not cause insecurity but it is the political and religious leaders that sometimes use ethnic sentiments to pursue their selfish ambition to create mistrust and resentment between ethnic groups and religion.
6. Unemployment - The overwhelming unemployment rate is capable of causing panic especially when it comes Nigerian youth. Graduate unemployment is a serious threat to national security

### **Sustainable Development**

Sustainable development is a concept that focuses on progress, advancement, conservation, and preservation of gains for the present and future. It encompasses personal and national growth, including economic, agricultural, educational, social, religious, and cultural institutions. It satisfies current demands without compromising future generations' capacity to meet their own needs. Sustainable development aims to improve people's lives and the country's growth, ensuring sustained growth over time. This concept encompasses social, economic, and environmental aspects.

The United Nations Millennium Declaration emphasizes social, economic, and environmental advancements as crucial for human progress. Sustainable development aims to meet human needs while protecting the environment for future generations. It requires initiative, resourcefulness, inventiveness, and self-discipline. High-quality science education is essential for sustainable development, as it fosters environmental sustainability and economic growth. The Agenda for 2030 Sustainable Development Goals (SDGs) recognize quality science education as a primary tool for their implementation. Self-reliance and development are closely linked, and a more sustainable world is necessary for society and the planet. Sustainable development focuses on social inclusion, economic growth, and environmental protection, while unsustainable development prioritizes personal interests over the environment. The 2030 Agenda for Sustainable Development includes 17 development goals addressing poverty, hunger, poor health, and gender inequality, access to clean energy, water, sanitation, industry, innovation, infrastructure, reduced inequality, sustainable cities, responsible consumption, climate change action, and peace, justice, and strong institutions.

### **Importance of Science Education to Sustainable National Security and Development**

Science education is crucial for a country's development, particularly in the field of science and

technology. It helps address unemployment, improve national security, and equip individuals with the necessary skills for various industries. Physics graduates can work as electronic technicians, radiologists, teachers, or lecturers. Information and communication technology (ICT) relies on science education, as it provides the fundamental subjects required for engineering, medicine, and architecture. Biology education is essential for developing nations like Nigeria, where graduates can work as self-employed contractors, employers of labor, or teachers in fields like bioinformatics, bioremediation, biofuels, and bio fermentation. Chemistry education can be applied in various industries, such as agriculture, soap and detergent production, metallurgy, petroleum, ceramics, plastics, glass, medicines, cement, food and beverage production, and education. Chemistry is a bedrock subject for all sciences and science-related courses in postsecondary education, as it is required for students pursuing engineering, agriculture, pharmacy, medicine, nursing, optometry, medical laboratories, and social sciences.

### **Challenges Hindering the Development of Science Education**

1. Insecurity - Insecurity issues in Nigeria has become very worrisome due to insurgency like terrorism, banditry, boko haram and kidnapping. These constitute serious threats to the peaceful coexistence of the citizens and are indeed hindering the development of science education. The lives of nationals including lecturers are in danger of abduction or kidnapping. The most recent example is the abduction of female students from federal university Dutsinma and Gusau, in another example some lecturers including a professor were murdered. Many science infrastructures were vandalized in the process and this is indeed affecting science education programme. Many parents have lost their jobs and many have been looted their wealth and this has caused many students to become dropouts and cannot complete their education because their school fees cannot be paid. These children if opportune to complete their education can become future science teachers or scientists such as engineers, Medical doctors and pharmacists, these children are then utilized by politicians to cause nuisance to the society. This indeed affects the development of science education in Nigeria.

2. Corruption - corruption is another significant factor that is hindering the development of science education in Nigeria. Examples include bribery, fraud, stealing of public fund and embezzlement.

3. Political instability - The stability of political system of government is very crucial to the educational development of any nation

Educational program change according to the taste of the government. Some of the leaders have no regard for education as a result of which many science equipment are lying in waste in our schools.

4. Inadequate teaching/learning resources - Most of our schools lack the teaching-learning resources and where there are these resources, they are inadequate. Science teaching is not interesting when learning resources are not available according to Ekanem and Obodon in (Ofordun and Onyekwena (2021)), Poor laboratory facilities and inadequate classrooms are the major constraint s to science education in Nigeria.

5. Lack of qualified science teachers - A science teacher is a key factor to be considered when talking about the development of science education in any nation. The so - called science teachers in Nigerian schools are not professionally qualified; they may have the knowledge of the science subject but lack the method of teaching it. Attitudes of many teachers to science teaching are discouraging. For example most of these teachers have been teaching science for many years without upgrading their certificate.

6. Lack of motivation - Science teachers are poorly remunerated and this is affecting the morale of these teachers, it also distracts and impede their commitment and efficiency.

7. Lack of proper monitoring - Proper monitoring of schools is very essential in the maintenance of standard because quality addresses the issue of accountability in educational practice in terms of the use of human and non - human resources. Monitoring and supervision should be carried out regularly.

8. Inadequate funding - Finance is a major resource that cannot be compromised in its utilization in schools, proper funding of science education results in numerous advantages such as the provision of instructional facilities like well-equipped laboratories and classroom furniture. Finance is crucial to the survival and success of every human organization (Afegena in Boris, Adigun & Awodun, 2021). Poor remuneration affects the morale of the teachers, distracts and impedes their commitment, efficiency and effectiveness. Underfunding of education is connected to factors like mismanagement of funds and lack of focus.

### **Strategies for Solving the Problems**

1. Provision of adequate instructional materials and laboratory equipment
2. There should be more employment opportunities to the citizenry
3. Qualified teachers should be employed for teaching sciences at both secondary and tertiary institutions
4. There should be curriculum reform at all levels of education with a view to providing its recipients broad based education in the development of the mind
5. The government should wage war against corruption such as bribery, fraud, embezzlement of public property etc.
6. The government should put an end to insurgency such as banditry, boko haram and kidnapping.
7. There should be adequate inspection and supervision of public schools.
8. Adequate provision of funds to science education program by the government and stake holders in education.
9. Teachers should be adequately motivated.
10. There should be a stable system of government.

### **Conclusion**

The country needs a quality science education program to address security challenges and promote self-reliance. Teachers should encourage students' interest in science and use effective teaching techniques. This program enhances entrepreneurial skills, prepares students for small-scale business management, and creates jobs, reducing poverty and employment. The government should prioritize science education as it is crucial for sustainable national security and development, as industrial and technological development are based on it.

### **Recommendations**

1. Government should find possible ways to put an end to the activities of insurgents like kidnapers and terrorists by proper modernization of security agencies through adequate training on how to use highly modernized technological weapons.
2. Corruption of all kinds ranging from bribery, fraud, stealing of government property etc should be prevented
3. Proper monitoring and supervision of schools must be done regularly
4. Science teaching - learning resources should be made available in schools .So that science teachers can engage their students in practical work.
5. Government should provide necessary funds for the training and retraining of science teachers so that they can be more competent, effective and efficient
6. Teachers should be more innovative in their utilization of teaching aids and equipment needed for teaching science subjects.
7. Government should ensure that teachers' salaries are adequately paid.



8. Scholarly opportunities should be awarded to science students.
9. There is need for diversification of Nigeria revenue sources through improvement in solid minerals and agriculture and tourism sectors to boost the economy
10. Professionally and academically qualified teachers should be recruited to teach science subjects
11. Science education curriculum should be reviewed in such a way as to collaborate with entrepreneurship.
12. More employment opportunities should be provided by the government so that the issue of unemployment can be drastically reduced.
13. There should be quality assurance units that involve the quality of the teachers, quality of instructional materials and facilities, school environment, students and quality of the academic programmes in all institutions of learning.

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