
SCIENCE EDUCATION AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

The paper examines the concept of Science Education in Nigeria and how it can enhance Sustainable development in the Country. It also discusses the History of Science Education in Nigeria and takes a cursory look at Science Education in Nigeria today in relation to the implementation of the curriculum. The paper further examines prospects for Science Education in the country and factors hampering the effective development of Science Education in the country. The paper concluded that effective Science Education in the country is the key to Sustainable development especially as the country strives towards becoming one of the top 20 economies in the world by the year 2020.

Keywords: *Science Education, Nigeria, Sustainable development*

INTRODUCTION

The world population turned the 7 billion bend on Monday, 31st October, 2011 and is expected to reach 8.5 billion by 2025 (Merkel, 1998 and Blewitt, 2011). This increasing population continues to pose great challenge to the human race. This is because it will lead to increased global challenges as the newly industrialized countries of Asia and Latin America are currently experiencing very rapid economic growth that has increased global energy requirement and bringing new environmental problems, including air and water pollution and waste problems, to wider areas of the globe. Other attendant consequences of increasing population are: Climate change, ozone-layer depletion, and loss of desertification, deforestation and worsening social conditions in developing countries, Nigeria. It is estimated that more than 1 billion people globally now live in poverty without sufficient food, adequate educational opportunities, or any possibility of political participation (Merkel). It is in a bid to forestall some of these challenges that the 1992 UN Conference on Environment and Development had embraced sustainable development as the key aim of the 21st century (Merkel, 1998). Sustainable development seeks to reconcile environmental protection and development; it basically refer to using resources no faster than they can regenerate themselves, and releasing pollutants to no greater extent than natural resources can assimilate them (Merkel, 1998). It has been consistently stressed that initiatives on sustainable development must mobilize appropriate science and technology. Thus, this paper focuses on the importance of Science Education and how it can enhance sustainable development.

HISTORY OF SCIENCE EDUCATION IN NIGERIA

Science Education is that aspect of education that leads to the acquisition of practical and applied skills as well as basic scientific knowledge (Garba, 2009). The teaching of Science in Nigeria began as far back as 1842 with the teaching of Nature Study in Badagry (Okebukola,

2009). In 1859, schools in Lagos started teaching General Science. Natural Science subjects like Chemistry were introduced in 1861 and 1948 in Lagos and Ibadan respectively (Okebukola, 2009). As at 2009 Science-based subjects were taught in over 40,000 secondary schools and 96 universities. About 125,000 students were enrolled for Chemistry (a Science subject) in the Nigerian university system (Okebukola, 2009).

CHALLENGES OF SCIENCE EDUCATION IN NIGERIA TODAY

In Nigeria today, Science Education has been divided into three levels:

- i. Basic Education
- ii. Senior Secondary Education and
- iii. Higher Education

Despite the huge number of Universities of Science and Technology, Polytechnics and Federal Colleges of Education (Technical) in the country, we are still bedeviled with a plethora of problems hampering the effective development of Science Education as Nigeria has failed to provide the enabling environment for its true development. Some identified problems are:

- i. Lack of good and adequate facilities
- ii. Curriculum:
- iii. Students
- iv. Teachers
- v. Our value system:

Lack of Good and Adequate Facilities: In our secondary schools, there are inadequacies in laboratory and library facilities. At the Higher Education level, that is in the Polytechnics, Colleges of Education and Universities, there is a dearth of library resources, no modern equipment and instrument and lack of technical know-how on how to operate some of these instrument where they are available.

Curriculum: The country has one of the best curriculum in the world. The Intended curriculum is excellent but as is the case with our other aspects of life, the Implementation of the Curriculum is poor and as a result the achieved Curriculum is very poor The Curriculum Delivery is:

- Teacher-centred; mainly note taking
- There is scanty focus on practical work
- Little attention is paid to the teaching of environmental issues (Idowu, 2011)

Consequently, the achievement of the Curriculum is poor at all levels of Science Education that is the Basic, Secondary and Higher Education levels.

Students: Less than 30% of basic education students are interested in studying science (2008 National Survey) About 25% opt to be streamed into the science class after Basic 9 (2008 National Survey) and most of the students are keen on cheating in examination because of poor reading habit; good video-watching habit (Odia and Omofonmwan, 2007).

Teachers: Most of the teachers in secondary schools have shallow content knowledge and are weak in physical sciences and in solving science-based problems. They also have poor practical skills. In the University, the lecturers have shallow content knowledge (especially young lecturers). They also have: Weak research skills, Poor in practical skills, Poor assessment skills and Knowledge of environmental issues not impressive

Our Value System: Institutions that teach Science and Technology like the polytechnics are unattractive and unacceptable to most Nigerians. Even parents do not encourage their wards to go for Science Education. So, only students who could not secure admission into the University go to the polytechnics and as a result, it becomes a dumping ground for bad students..

PROSPECTS OF SCIENCE EDUCATION IN NIGERIA

Despite the present shortcomings, Science Education in Nigeria is improving and the prospects seem very bright if honestly and dedicatedly pursued by all stake holders. In the Basic and Senior Secondary School levels, the federal government and most states are making efforts to improve the teaching of Science Education as instructional and other educational materials are now being distributed. Also, Unity Schools are benefiting from STEP-B and other funds like the PTDF.

In the Higher Education level, there is steady improvement in Science Education as a consequence of NBTE, NCCE and NUC accreditations. The institutions are also benefiting from STEP-B funds, PTDF, TETFUND and other agencies.

MEETING THE CHALLENGES OF SCIENCE EDUCATION IN NIGERIA

In order to meet the challenges and provide effective Science Education to Nigerians: The following are prerequisites:

- i. Our value system has to be changed. There is need for people to be encouraged to attend Polytechnics and Technical Schools so that the country can have quality manpower in Science and Technology.
- ii. Only qualified and properly screened students should be admitted into the higher education level of Science Education.
- iii. The regulatory agencies at all levels should ensure that the curriculum is well implemented so that 100% curriculum delivery could be achieved.
- iv. The government at all levels should ensure that only qualified teachers are employed at the Basic, Senior Secondary and Higher Education levels and that teachers are constantly attending conferences, workshops, seminars and other training to improve their practical skills.
- v. The government should also ensure that the required facilities are provided and well-trained staff are employed to operate them.

THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs

(Holbrook, 2009). It can also be seen as balancing the fulfilment of human needs with the protection of the natural environment so that these needs can be met not only in the present, but in the indefinite future (Brundtland Report, 1987).). The figure below shows that it is clearly represented by the intersection of the social, environmental and economic factors.



Sustainable development is very wide in scope and tackles environmental issues such as:

- Climate Change
- Pollution
- Biodiversity loss
- Desertification
- Acid Rain
- Waste Management
- Flooding

Sustainability could be measured using the following parameters:

- ❖ Environmental Sustainability Index (ESI)
- ❖ Pilot Environmental Performance Index (EPI)
- ❖ Genuine Progress Index (GPI)
- ❖ Happy Planet Index (HPI)

The paper will only discuss on Happy Planet Index, which is an index of human well-being and environmental impact (Okebukola, 2009). Each country's HPI value is a function of its average subjective life satisfaction, life expectancy at birth, and ecological footprint per capita. In 2009, HPI Scores range from 0, the worst, to 100. To get a perfect score, a country should have high levels of life satisfaction and life expectancy, as well as a small ecological footprint. Nigeria is ranked in the 115th (30.3) position (Okebukola, 2009).

EFFECTS OF UNSUSTAINABLE DEVELOPMENT

It has been shown by studies that unsustainable development has a lot of detrimental effects on the globe. Its effects include:

- Rising of Temperatures and sea levels. It has been reported that global average temperature could rise by between 2.4°C and 5.8°C between 2007 and 2100 (Okebukola, 2009).
- Declining of ice and snow cover.
- Also, it has been reported that by the 2080s the annual number of people at risk from coastal flooding due to surges could increase from about 10 million to as many as 80 million worldwide (Okebukola, 2009).

- Already, a lot of communities in Nigeria has just suffered from massive flooding and are still reeling from it effects.
- Food insecurity
- Global security
- Increased desertification
- Biodiversity loss

Nigeria is currently working towards achieving its vision 20:20:20, that is becoming one of the top 20 economies in the world in the year 2020. This, coupled with our increasing population could lead to unsustainable development if not tackled rightly.

SCALING THE HURDLES OF UNSUSTAINABLE DEVELOPMENT

Sustainability science is not yet an autonomous field or discipline, but rather a vibrant arena that is bringing together scholarship and practice, global and local perspectives and disciplines across the natural and social sciences, engineering, and medicine. However, in the drive towards autonomy and in ensuring sustainability in development especially in a country like Nigeria, it is obvious that the teaching of Science Education should be emphasized at all levels. Thus, topics on causes, effects, prevention and control, mitigation of environmental challenges like climate change, pollution, biodiversity, flooding, desertification, waste management, acid rain, etc should be taught at all levels of Education. This is important because Alebiosu and Ifamuyiwa (2008) posit that Science education plays a vital role in the lives of individuals and the development of a nation scientifically and technologically and is generally acknowledged as the gateway to the scientific and technological survival of a nation. So the students should be introduced to it right from the Basic level of education.

CONCLUSION

In conclusion, it could be seen that effective Science Education in the country is key to Sustainable development especially as the country strives towards becoming one of the top 20 economies in the world in the year 2020.

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