



## ENHANCING SCIENCE EDUCATION FOR SUSTAINABLE DEVELOPMENT IN A DWINDLING ECONOMY IN NIGERIA

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### ABSTRACT

The study focused on enhancing science education for sustainable development in a dwindling economy in Nigeria. The paper explained that enhancing science education for sustainable development in a dwindling economy can only be achieved in Nigeria if teachers at all levels of education are empowered economically. It also went further to assert that no nation can improve its economy without education and educational goals cannot be attained without the stakeholders. The paper explained the myths of science education to include: Large percentage of teachers not being competent, teachers not being properly motivated to teach science, lack of good curriculum among others. The paper also discussed challenges of a sustainable science education in a dwindling economy in Nigeria. It concluded that the development of any nation depends directly on education and its level of scientific literacy. Science education if fully implemented will accelerate sustainable development in Nigeria by providing the bedrock upon which technological advancement of the nation can be built. Recommendations were made among which are that there should be proper funding of schools in order to achieve positive outcomes and there should be improvement in the working conditions of science teachers in Nigeria so that they can put in their best in teaching the students.

**Keywords:** *Science, Education, Sustainable, Development and Dwindling Economy.*

### INTRODUCTION

Enhancing science education for sustainable development in a dwindling economy can only be achieved in Nigeria if the teachers, instructors and the lecturers are empowered economically. No nation can improve its economy without education and educational goals cannot be attained without the stakeholders such as, the teachers, instructors, lecturers,

parents and the government. Science education according to Pember and Humbe (2009) is a process of teaching or training especially in school, to improve one's knowledge about environment and to develop one's skill of systematic inquiry as well as natural attitudinal characteristics. Science education has been recognized worldwide as a pre-requisite in technological development, Science education involves the study of science, educational knowledge and concepts (Okoli, Obiajulu and Ella 2013). This means that no nation can globally be recognized without putting science education and its scientific advancements in a proper shape.

Despite the fact that science education is important and paramount for sustainable and national development in a dwindling economy, Nigeria has not been able to sustain science education since independence and as a result, science education has been unable to move the country into industrialization and above poverty level. According to Momeke (2007), science education has failed to produce skilled human resources needed for transformation into national prosperity. This implies that most of Nigeria's development in the direction of modernization has been haphazard leading to acquisition of obsolete technology. Sustainable science education development in a dwindling economy therefore represents a process for social educational training and public awareness. The values, behaviour and lifestyles required for a sustainable future development in a dwindling economy in Nigeria cannot be achieved without science education.

### **Different Views on Science Education and Sustainable Development in Nigeria**

Okoli, Obiajulu and Ella (2013) carried out a study on science education for sustainable development in Nigeria: challenges and prospects. They opined that sustainable development in Nigeria can be actualized through science education. In their study, they looked at the myths and the benefits of science education, roles of the science teachers, the challenges and prospects of science education. They recommended among others that the government should provide necessary science research equipment in the research institutes so that Nigerian scientists can carry out research work without tears especially with respect to the economy of the country. They also posited that science teachers should be well paid so that they can put in their best in teaching the students.

Omole and Ozoji (2014) explained that content and years of basic education differs around the world. They noted that low quality of education is often received in poor regions or in countries where resources are not properly managed. Quality education which in their view leads to acquisition of relevant skills and knowledge required for sustainable development can be achieved through formal and informal education. The key factor is for the knowledge to be relevant to the society and be able to solve the unemployment challenges for the economic empowerment of an ever-growing population. To achieve this in Nigeria, the relevant focal points for sustainable development must be identified and addressed. The non-formal aspect of education has to be looked into. Science and entrepreneurship education must be strengthened and admission policies into relevant courses that address societal needs should be reviewed.

Larai, Christine, Christiana, Jimwan, and Adamu (2017) examined development of science education in a globally depressed economy. They explained that effective and stimulating science education is fundamental for both the future of science and the ongoing development of our global knowledge society. Yet there is concern in the majority of countries that the overall level of scientific literacy is poor and that children are not being attracted to scientific studies and eventful careers as Scientists. Given its mission of strengthening international science for the benefit of society, science education is an area of obvious interest. The need for a scientifically literate populace is increasingly recognized as critical in many countries, as they face the consequences of increasing population pressures, global economic depressions, limited resources and environmental degradation. There is a consensus that in many places around the world, science education is facing serious challenges. As countries face the demands of expanding populations under economic constraints, education as a whole is frequently one of the first areas in which funding is cut to free up resources for other apparently more pressing demands. This trend is amplified in the area of science, since often those in political decision making sector have limited appreciation of scientific disciplines and their importance to the vitality of their country's economy. It is clear that developing countries face greater challenges in science education than economically developed countries due to lack of teaching materials including books, computing communication technologies, community based science centers, laboratory facilities and equipment, as well as shortage of skilled teachers.

Given this world scenario, and the needs of society, there is an urgent need to improve the preparation of scientists of tomorrow, not only through widespread access to quality instruction, facilities, research, opportunities for all students, but also to improve the economies.

Christiana (2012) carried out a study on revisiting science education and national development: Nigerian situation and the way forward. She explained that a good science education programme is expected to achieve an appreciable national development. But, it is a reality that Nigeria as a nation is not developed in spite of the proposals of successive governments as contained in the national policy on education. This means that the Nigerian science education programme is not contributing to national development contrary to expectation. The impotence and disabilities are attributable to defects inherent or associated with certain factors like: historical evolution, aims and objectives, parental influence, gender factors, curriculum factors, teachers and teaching methods, availability of resources, evaluation processes, research and review among others. This situation is tantamount to a lack of agreement between intents and implementations. Christiana's recommendations include proper use of research findings, adequate and proper training and retraining of teachers in contents and processes of science education, revisiting and off-loading the existing science curricula, elimination of gender biases; counseling parents and youths on the much needed national development, and ensuring that all practices in science education are monitored and evaluated from time to time, with shift of emphasis away from paper certificates and rote learning, to an integration of science, technology and society.

Ayoola, Ayoola and Balogun (2017) examined achieving national stability and economic survival in Nigeria through science, vocational and technical education. It was stated that as the government pushes ahead to make Nigeria a global economic giant, many companies and agencies are playing various roles in the quest to diversify the revenue base of the nation. In their explanation, there was an attempt to assess the economic performance in Nigeria with a view to identifying what went wrong with the nation's economy. It also focused on the importance of science education to development and economic survival of Nigeria and viewed vocational and technical education as having major roles to play in the nation's economic development. They suggested that science, vocational and technical education are means of salvaging a mono-economic nation

like Nigeria and concluded that factors militating against effective teaching and implementation of science, vocational and technical education be removed.

Garuba, Agweda and Abumere (2012) stated that in order to enhance Science and Technology Education, it is necessary to understand the contribution of Science and Technology Education to national development. They examined the contribution of science and technology education to national development; The Nigerian experience, with a view to making it a tool for national development. Since societies that discriminate technical education among its counterpart pays a high price in their ability to reduce poverty and development. Enhancing national development depends on improving the situation of technical education. Reducing the gap in education reduces individual poverty, encourages economic growth and enhances national development. Problems and Challenges to National Education Policies were also discussed as they relate to difficulty in utilizing research findings, training and retraining of well qualified science teachers, difficulty in keeping up with emerging science and changing teaching practices, public perceptions related to science, difficulty in maintaining a relevant science curriculum at all levels, funding and lack of information.

### **Myths of Science Education in Nigeria**

Bower and Pine (2009), as cited by Okoli, Obiajulu and Ella (2013) identified many myths of science education. Other scholars are also in agreement that the myths include:

**1. Incompetence of large percentage of teachers:** Nada (2008) observed that the status of competency in secondary school science education in Nigeria appears very low. He went ahead to report that majority of teachers who are already in the system seem to lack initiatives and skills that are imperative to move the standard of science education forward to meet global educational challenges. Modebelu, (2007) in support of the above, indicated that majority of these teachers who lacked competencies were as a result of inadequate remuneration and substantial professional development. Gardner (2005) as cited by Okoli et.al (2013) agreed that a good percentage of teachers (scientists) lacked desired competency for imparting science education. This is to say that with inadequate remunerations, sustainable development through science education in a dwindling economy cannot be achieved in Nigeria.

**2. Teachers are under motivated to teach science:** Okebukola (2006) as cited by Okoli et.al (2013) reported that teachers already consider science to be one of the contemporary fields of study and that attempts to transfer the excitement of science through lectures give teachers the opportunity to experience the thrill of doing science themselves instead of presenting science as a purview of the elite. Okeke, (2009) noted that programmes that combine “science excitement lectures” with “hands on” experiments usually re-reinforce unproductive attitudes. There should be a laboratory in a sharp contrast to inquiries, which gives teachers opportunities for real open ended scientific discoveries. It should be noted that in “real science” the answer is never simple, singular, and stable or in many cases even known. When the focus of science education was changed from science content to science process, the hesitation of teachers to teach science greatly diminished.

**3. Supplementary teacher training is necessary in sciences:** Research has shown that a teacher with adequate materials, enough time, good classroom and science experiment as well as management skills can actually provide their students with an excellent science education with remarkable little science content knowledge. This was collaborated by Bower and Pine (2009) who found that the more college science courses the teachers have taken, the more likely they should be to model their teaching on the lecture based approach in science professions.

**4. Lack of good curriculum:** This implies that there is no good readily available inquiry-based curriculum. It has been observed that it is much easier to reform a curriculum than to develop a new curriculum. Curriculum development is costlier and time consuming. It also requires long term revision, field testing and evaluation by a highly talented, motivated, experienced and educated development team to develop a new curriculum.

**5. To provide complex information in a digestive form as possible.** This indicates that disturbing simplified scientific information is about the last thing a Scientist should do. Watered down lectures only serve to reinforce in teachers, the sense of incapability of understanding scientific principles, reinforcing the insecurity that many teachers already feel about science. It is also noted that “classroom management” skills required to organize time and materials or help students work in cooperative groups are not

something that most Scientists know anything about. However, what Scientists seem to know is how to conduct investigations.

### **How Science Education can be used to attain Sustainable Development in a Dwindling Economy in Nigeria.**

Sustainable development in a dwindling economy in Nigeria can be achieved with a better science education for the students. This means better future for the society as students will develop into more responsible citizens who can help to build a strong economy, contribute to a healthier environment, and bring about a brighter future for everyone. The more science-literate individuals are, the stronger their society can be. Specifically, the lessons and skills science gives can have effects that will help make more responsible citizens, a strong economy, a healthier environment, and a positive future for all. Students who have learned to think critically and have a healthy dose of skepticism can better make their own informed decisions, which can make them more enlightened, informed voters and stronger consumers. Also, the sense of responsibility and caution that science provides-along with the understanding of how things work (be they chemical reactions, human development, or nutritional needs) can help future parents to provide safe, healthy environments for their own children, and be more responsible pet owners and neighbours.

### **Challenges of a Sustainable Science Education in a Dwindling Economy in Nigeria**

The following are the challenges of a sustainable science education in a dwindling economy in the country:

1. Poor Funding
2. Lack of instructional materials
3. Large class size
4. Poor work conditions of science teachers
5. Use of ineffective teaching methodologies
6. Political Instability

### **CONCLUSION**

The paper looked at enhancing science education for sustainable development in a dwindling economy in Nigeria. It explained that the development of any nation depends directly on education and its level of scientific literacy. Science education policies if fully implemented will accelerate the sustainable development of Nigeria by providing the

bedrock upon which technological advancement of the nation is built. The paper also listed some of the challenges to science education for sustainable development in Nigeria.

## RECOMMENDATIONS

The following recommendations were made:

1. Proper funding of our schools in order to achieve positive outcomes in science education.
2. There should be improvement in the working conditions of science teachers in Nigeria so that they can put in their best in teaching.
3. There should be training and retraining of science teachers in other for them to acquire new experiences in terms of their profession.
4. The government, individuals and cooperate organizations should give scholarships to candidates wishing to take up careers in the fields of science education.
5. There should be utilization of findings and recommendations from scholarly works in science education in Nigeria.

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