

RE-ENGINEERING SCIENCE EDUCATION FOR EMPLOYMENT AND SELF-PRODUCTIVITY IN NIGERIA: THE WAY FORWARD

Helen Ngozi Ebeh

Abstract

Nigeria is a country that is endowed with huge natural resources. In spite of these endowment, the social well being of a large percentage of her citizens is characterized by clear signs of under development. This paper draws a link between qualitative science education for skilled manpower, productive economic and technological growth. It also highlights some of the strategies to meet the challenges of the global world. Recommendations on how to face these challenges were made.

The development of any country can only take place when the citizens of that country are well educated to acquire the relevant knowledge and skills that will enable them to solve her numerous problems, that their country is faced with which, will in turn promote the country's development and improve living conditions of the people in the country. As such, Nigerians have striven some while ago, even before Independence, to be educated.

The gross underdevelopment, economic doldrums, infrastructural decay like bad road, instability of electricity, scarcity of water, insecurity and corruptions are yet to be addressed in our country. But in recent years, Nigeria has been experiencing a great turn around in terms of development and conditions seem right for launching onto a path of sustainable and rapid growth. Science education is one of such tools through which Nigeria can meet up with such goals.

Fwatshak (2006:6) notes that as an underdeveloped country, Nigeria has an unattained potential with her growth rate fluctuating and declining since 1988. The Addis Ababa (Ethiopia, 1961) conference of Africa states on development of education in Africa organized by UNESCO and EGA among other important pronouncements, recommended that "African educational authorities should revise, reform the content of education in the area of the curriculum of books and methods, so as to take account of the African environment, child development, cultural heritage, demands of technological processes and economic development especially industrialization (UNESCO. 1961).

Education is an important tool of national development. One of the national goals of education as stipulated in National Policy on Education (NPE, 2004:8) is the acquisition of appropriate skills and the development of mental, physical and social abilities and competence as equipment for the individual to live in and contribute to the development of the society. Acquisition of specialized skills by individuals helps them to develop the society. The major factor responsible for the wide gap in the level of developing nations is the level of development of pure and applied science in those nations. Therefore, for Nigeria to face the challenges of this global world, produce a self productive individual, science education need to be re-engineered.

Concept of Science

The term science has to do with nature. It is derived from Latin word "Scientia" which means "what to know", what is a fact, truth or certain. Science is the study of natural phenomena and is distinguished from other fields because it relies on the hypothetical deductive, experimental approach, (Mbajjorgu, 2003:25). AH (2000:12) perceived science as act of doing and it's more concerned with various investigative processes and activities with regards to developing, acquiring and controlling knowledge, skills, capacity and attitude about the natural factors of the environment.

Science, according to Onah (2003:36) is the bed-rock upon which any nation can be built. It is said to be a very important aspect of man's life so much that its role in societal development has been revealed by various civilizations world-wide., No country can be globally recognized without talking about its scientific advancements. This can be seen in all aspects of life, such as medicine, engineering, industries, education etc. Science education has been recognized worldwide as a pre-requisite in science and technological development. Science education encourages students to think and act as responsible scientists by providing opportunities for them to acquire knowledge and understand relevant concept. Maduabum and Akuezuilo (1986:99) revealed that education through the study of science produces economic benefits and contributes 10 a country's future wealth by increasing the productive capacity of its people

The Challenges Facing Science Education

Despite the numerous changes and educational reforms, science education has not been able to lift the country either into industrialization, or above poverty level. Much of Nigeria's development in the direction of modernization has been haphazard leading of acquisition of obsolete technology. There is marked decline in productivity and employment opportunities. Much of our daily lives are marked by peculiar lack of order.

The questions now are why has science education failed to produce skilled human resources needed for transformation of the rural production into national prosperity? Why has Nigeria not been able to use the domestic resources of science to improve the quality of life and living, economy, infrastructure, ailing industries, raw material resources, communication etc? What are those impediments to quality science education? In seeking answers to these questions several issues have been critically analyzed as suggested by Momeke (2007:93)

1. Education generally and science education in particular in schools and institutions of learning are not what they should be. Financing education as recommended by the United Nation is awaiting consideration. Proposal for adequate funding of science education ends on the drawing board. Science education if adequately funded, will help Nigeria to meet up the global challenges.
2. Gone are the days of the chalk and pencil teaching-learning process. Students and teachers are yet to be familiar with the use of internet, the website, online chat in the classroom which is the current ICT learning materials and paramount for ICT skill acquisition.
3. There is massive brain drain of some of the most capable teachers in science education especially at the tertiary level. Most of the highly skilled and qualified teachers prefer to move from Nigeria to foreign countries where they can work in better conditions and earn more money.
4. Infrastructural decay and non-availability of essential materials for learning science is now synonymous with science education classrooms and laboratories. Learners have come to feel and believe that science is like all other disciplines which can be studied without necessary infrastructure, equipment and materials
5. Practical science and laboratory work as means of developing skills in investigative science, creativity and mental skills have been so highly neglected.
6. There is no access to electronic library for science teaching in some of our institutions.
7. The economic recession has taken tremendous toll on education in general and science education in particular. Funds are never available. Equipment and materials are obsolete, chemicals are caked and expired, and students are expected to purchase chemicals for laboratory researches and energy to power some laboratory activities are never available
8. More emphasis is placed on measuring students' performance and knowledge acquisition with a total neglect to skill acquisition, creativity, scientific reasoning and critical thinking,

productivity and entrepreneurial skills development. For science education to be re-engineered for employment and self productivity in Nigeria, these factors need to be addressed.

Re engineering Science Education: The Way Forward

Nigeria like other countries of the world had formulated a number of policies that could enhance the growth of science education for sustainable national development in order to produce capable science personnel who would stir the various technology-driven aspects of the economy. For more employment opportunities and self-productivity in Nigeria, science education must be re-engineered and redirected towards skills development.

To re-engineer science education, the curriculum will have to be carefully designed and implemented to encourage creativity, independence, adaptation in the use of new teaching approaches. Annan (1999:72) saw curriculum as formal and informal process by which learners acquire knowledge, understanding and develop skills, attitude, appreciations and values under the school. Similarly, Sockette (1976) in Annan (1999:73) viewed curriculum as a "program of activities designed so that students will attain certain specific aims and objectives. There is the need to know how appropriate, relevant, and current these curricula are. How well they have been able to impact the desired skills in the learner. In line with this, Opara (2004:25) stressed that there is a need to adapt science curricula to equip learners with strategies, attitudes and skills to live effectively in society and enable them respond to experiences that may arise from time to time. Okwu (1981:16) advocated the inclusion of several scientific activities that have remained untapped due to poor science knowledge and inadequate manpower while Jegede (2002:14) has made call for inclusion of contemporary science issues and knowledge which control world affair but which are not known to most science teachers and students at the secondary school level. Re-designing and implementing science education curriculum in such ways will aid science education in Nigeria to create creativity.

To meet the future needs of science education for sustainable national development, science teachers would be required to increase emphases on the use of up-to date interactive teaching approaches such as constructivism, activity base and hand-on activities. Meaningful pedagogy should be used to bring students close to science and technology. Science education should be taught based on our culture drawing examples from local environment. The teaching and learning of the subject matter require the use of discovery approach as well as innovative methods that stimulates students' interest. Onose (2006) stated that the teaching and learning of science should involve activities and room given to students to think or reason about what they are doing in order to look for relationships which may enhance and build up a store of scientific techniques.

Adequate teaching and learning environments such as well equipped laboratories, functional libraries, classrooms, and the use of modern materials for teaching create more concrete knowledge and positive attitude towards the discipline; encourage the application of imaginative thinking and link classroom science to everyday life in society. Moemeke (2007:10) stated that exposure to technological equipment in teaching such as computer and internet, video automated teaching etc will expose learners and teachers to think in the same direction as their counter parts in other nations of the world. This will definitely help in producing self-productive scientists

Re-engineering science education for employment and self- productivity in Nigeria; calls for a re-think in the mode of assessment of science outcomes. The continued dependence cognitive instruments for the assessment of skill- oriented, creativity-laden and reasoning-related science outcomes do nothing but kill innovativeness in teaching, creativity and skill inculcation. The need for alternative process oriented and divergent assessment techniques in evaluating science outcomes leading to a radical departure from the age-long examination and elitist states of assessment has been suggested by Jegede of (2002:15).

Another way forward in re-engineering science education for employment and self-productively in Nigeria is that the teacher's knowledge in science requires a review and restructuring. The content of teacher education curriculum in science and the quality of graduate science teachers call for inspection. The sensitivity of science education to economic and national life calls for best hands in

terms of skill, training and knowledge. Obanya in Awah (2006:75) highlighted some of the roles of a teacher as mediator of learning, disciplinarian, controller of students, judge of achievement, organizer of curriculum, bureaucrat, scholar, a researcher and a member of teacher organization.

Okurume (2003:62) suggested that the teachers' psychological attitude to teaching should be of high standard. The teacher should be interested in teaching, the more the teacher is exposed to learning, the more he is presumably able to make his teaching effective. Science teachers should involve himself into in-service training to acquaint him with relevant development in his field of training. He can be very effective in the classroom if he attends workshops that will help him teach his subject matter effectively.

Conclusion

The paper makes a plea that to be able to re-engineer science education, the curriculum would have to be carefully designed and implemented. Call for greater and more purposeful funding of education for human resources development as well as energizing other aspect of national economy has been stressed. If Nigeria is to develop and build a self-reliant nation, produce a self-productive individual, emphasis has to be made continually on the development, growth and re-engineering of science education in the school system.

Recommendations

If science education, mechanism for employment and self-productivity in Nigeria is to be re-engineered, the following points should be noted and urgently applied.

1. The science education curriculum should be improved Upon from time to time to meet the global modern challenges
2. There should be an inclusion of contemporary science and market issues of our present day world into science teacher education curriculum at different levels.
3. Teachers of science education should be adequately trained and motivated in order to make them committed to the job for efficient delivery of their lectures.
4. Problems of scarcity of resources like funds, infrastructure equipment, laboratories, textbooks and others should be addressed urgently.
5. More emphasis should be placed on information communication and technology to meet the new challenges of science education. This can be done through exposing both the students and teachers to technological equipment such as computers, internet and video automated teaching.

This paper hopes that the recommendations given above would help to take science education into employment and self-productivity.

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