

PROJECTING NIGERIA'S SCIENCE EDUCATION BEYOND THE PRESENT STATE TO PRE-EMINENCE

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Abstract

It is an undisputed truth that science and technology is the only known vehicle for the transformation of any nation to prosperity and the key to this vehicle is science education. This paper traverses through the dark terrain of science education in Nigeria considered to be the present state or status quo. The paper has also looked beyond the present state by presenting five power-point strategies as a way of projecting Nigeria's science education into pre-eminence. The strategies, if adopted, offer fresh petal of hope for science and technology in Nigeria.

Introduction

Science and technology hold the key to the social, economic and technological development of any nation, including Nigeria. The wealth of a nation depends entirely on the level of her science and technology education. An investment in science and technology is therefore a strong foundation laid for progress, wealth and prosperity of a nation.

A cursory look at the expenditure profile of different countries of the world on science and technology reveals that developing countries are at the bottom rung of the ladder while their developed counterparts occupy the topmost position. Inshort, Scientific and technological development is dependent upon the level of scientific knowledge a nation has.

Anya (1998), established a linkage between economic development on one hand and technological/manpower development on the other hand. He asserted that, while the developed nations spend 2.3% of their G.D.P. on scientific and technological research and development.

(R7D), Nigeria's expenditure profile is derisory with the data below to backup.

YEARS	COUNTRIES	% OF G.D.P SPENT ONR/D
1995	S. korea	2.69%
1995	U.S	2.4%
1995	Japan	2.96%
1995	Germany	2.27%
1994	France	2.38%
1994	U.K	2.19%
1992	Nigeria	0.08%

According to Jhingan (1985), what distinguishes the third world countries from the-developed nations is their level of science and technology.

In developed countries, most of their citizen are scientifically literate. Many countries are poor not because they are not blessed with natural resources but simply because they are unable to utilize their natural resources to their advantage. It was in line with this kind of thinking that Gbamanja (1990:57), was prompted to state thus:... what is needed in this direction therefore is to develop scientifically literate citizens who can manipulate their environment in rational terms so as to reap the fruits of their rich natural resources.

Our country Nigeria is underdeveloped, and yet to experience any meaningful social and economic growth, due to our low level investment in science and technology with the insidious repercussions of backwardness, poverty and other related problems (Uko, 2006). The recognition that science is important for development underscores the need for urgent intervention. There is not a single domain of human activity or culture in the modern world which has not been touched in one way or the another by the rise of modern science.

The Present State of Science Education: A Situation Report

It is truism that science education is still at its infancy in Nigeria. We are very much at the embryonic stage as there are many manifestations.

i. Poor and Unrewarding Instructional

Delivery: In many schools, science subjects are taught without the utilization of instructional materials. This makes learning boring, painful and unrewarding as many of our science teachers are un-resourceful. They are awaiting the arrival of factory prepared equipments and models for deployment during instructional delivery. And in the absence of this, they resort to the lecture method which is didactic. Here, verbalization is dominant on the part of the teacher where he merely presents verbal discourse on specific concepts or themes. This is counterproductive and cannot move Nigeria's science and technology to a greater height. We must go beyond the veneer of knowledge to the application and synthesis levels in science and technology. Ivowi (2000), had long opined that learning has a lot to do with resources. All theories of learning tend to support progression from concrete to abstract.

ii. Unfriendly Learners Environment:

The present scenario in our schools is a picture of an unfriendly science environment. Modern science, technology and mathematics teaching and learning emphasizes that learners "see science" in their learning environment. Different concepts could be made simple through this approach. This is deficient in our schools. Class participation is lacking in our science learning process. Science teaching are not made activity based and the infrastructure for promoting effective science learning are inadequate or non-existent.

iii. Ill-Prepared Science Teacher: Our primary and secondary schools are still witnessing a legion of ill-prepared science

teachers who have not been well groomed in the rudiment of science teaching. Science teaching must be done by science educationists. Science educationists are those who study the interrelationships between science as a discipline and applies educational principles to its understanding, teaching and learning. They are the only one who can programme scientific concepts for understanding as well as evaluating the science curricula meaningfully. (Dienye and Gbamanja, 1990). Poor science teaching spells doom for the nation as no nation can rise above the level of its teachers.

iv. Poor and Unrevised Science

Curriculum: In our Country, we still fall back on moribound science curriculum that cannot help our citizens go beyond the ordinary. Our schools science curriculum is plagued with the problem of fragmented approach accorded it and other numerous problems. Uko (2007), asked some thought provoking questions while questioning our present science curriculum as-, below:

How can we explain a situation whereby an engineering graduate cannot fabricate a, simple machine two years after a University programme. Why is there a decline of interest on the part of our students in science related subjects?

Why has examination malpractice occupied a centre stage at all levels of our educational system?

Why do our science students perform so poorly during terminal, qualifying or placement examination? Why are science materials/equipments disappearing from our schools laboratories?

Why are practicals/independent projects de-emphasized in our school system? - What cause our science teachers to skip some science or mathematics topics from the scheme of work or syllabus?

- Why do some developed nations reject some of our professionals who had duly completed their academic programmes.
- Why are Universities in Nigeria not among the top 200 in the world by UNESCO rating.

The answers to these questions are lamentable and are indicative of an unproductive curriculum.

Poor Scientific Culture and Ethics

Science has a cultural dimension and ethics. Right from the elementary stage, Nigerians should be indoctrinated as other citizens of advanced nations into the world of science. This will enable us appreciate science as a human activity, human endeavour and a way of life. By so doing, the confidence level of our learners to do science shall be beefed up. It will also, to a great extent, demystify science as a course for super-intelligent people only.

Again, our science students and teachers in training must be groomed in the ethics of science which includes honesty, quest for truth, objectivity in evaluating situation, openness, curiosity, persistence and tentativeness of what is known. All the scientific enterprises function on the basis of value system. According to Baike (2000), the situation in which science is seen and taught as a set of dogma or conceptually held as sacrosanct is unhealthy for intellectual development and has a high potential to stifle inquiry. This is a barrier to science education.

Communication/Language Problems

There is no gain saying that language plays a vital role in the scientific enterprises. Scientific concepts must be communicated and understood. And for ideational scaffolding to take place, a high degree of mental abstraction must be made. This is a function of language (Uko, 2002). In Nigeria, there are about 250 ethnic groups with many languages. None of these languages is adopted as a lingua franca leaving the communication of science concepts

and instruction at the mercy of English Language which is merely a second language and seen as difficult considering the mass failure experienced in public and qualifying examinations. In many countries of the Eastern block, science is being taught in their mother tongue. The language they dream with and have a control of, with regards to higher order expression. Obinabo (1980), had long warned that when basic concepts in science are not understood, their application becomes rather very difficult if not entirely impossible as these concepts are invariably clothed in a culture where the mother tongue is widely used in all sphere of societal transaction. This is a unique problem in Nigeria and it effects our science education.

Poor Examination Administration

The administration and assessment of science examination in our Secondary and tertiary levels of education has some weaknesses. In most developed nations, their examination centres on skill acquisition and mastery. Our concentration is on the regurgitation of facts, principles, theories and laws in the natural science. This domain of knowledge needed to transform this country from the acquisition of the content of sciences to production is not highlighted. This constitutes a serious problems to science education. We must move fast to produce our own farm equipment, drugs, bicycles, trains, ship, aeroplanes, office equipments, cloths, building materials etc and not the assembling of part.

Strategies For Projecting Nigeria's Science Education to Pre-Eminence

The present state of science education in Nigeria as outlined in the last subheadings are symptomatic of defects in our science education programme. They constitute barriers which must be dismantled. Although the wheel of change has been set in motion with the launching of Nigeria's Communication Satellite into the orbit in China on Sunday May 12, 2007, we must go beyond the ordinary in Science and technology

race. We must become great contributors in the global science and not just mere consumers of science and technology. Following all these and as a way forward, the following strategies have been suggested by this paper for projecting Nigeria's science education to pre-eminence.

a. Regular Review and Enrichment of our Science Education Curriculum

Science educators must get to the drawing board and review our science education programmes with a view to enriching it to meet the needs of the 21st Century. Such a curriculum will empower our youth with the relevant scientific and technological skills to turn Nigeria rich resources into goods and services that are highly demanded within and abroad. We must enrich our science education curriculum to address the current abnormalities glaringly observed in our science classes. For Nigerian citizens to achieve scientific and technological literacy, science - technology- society approach to science teaching and learning must be adopted. According to Wasagu (1997), the relationship between science, technology and society is inseparable because society affects science and technology too affects the society. The National Science teachers Association (NSTA) of the United States of America had long adopted the STS approach in their classrooms.

b. Capacity Building of our Science Teachers For Greater Productivity

Our science teachers should be assisted to be more resourceful. They should be exposed to the rudiments of improvisation and the adoption of result oriented teaching styles. They must become familiar with current concepts of science education, for examples, constructivism etc. Above all, they must be able to provide science friendly classroom environment. This will go a long way to helping the nation realize her Millennium Development Goal. Our science teachers must receive training in information and communication technology (ICT). This can

revitalize science teaching as well as improving the teacher quality.

c. Review of the Nations Science and Technology Policies

If Nigeria must be a self-reliant nation, we must review the nation's science and technology policies. The present policies cannot propel Nigeria to become an industrial giant. New policies must be articulated which describe broad strategic thrust, targets and instruments for the realization of our goals. We must redesign a new road map for our science education and how to get here.

d. Improvement of the Working Condition of Science Teachers

Science teachers must be well remunerated. The working condition of teachers should be improved e.g. regular salaries, science teachers allowances, leave allowances, adherence to standard class size, decent staff rooms, toilet facilities etc. This can go a long way to breaking the bonds with "Moonlighting" This paper seriously frowns at science teachers moonlighting as substitution of professional roles for other economic activities to make ends meet. Meaningful learning by learners cannot take place when teachers "moonlight"

e. Promoting the Use of Phenomenals for Science Teaching

Our school must take advantage of phenomenals for the promotion of indigenous technology. Phenomenals according to Uche and Umoren (1998), are instructional media like features, things, event, festival, settings and other community resources which the learners grasp at their natural or semi natural habitats. They enable learners to have direct contact with learning experience that will remain memorable. Phenomenals include dances, festivals, concert, games, community, professionals, aquaria, museum, biological gardens, hospitals etc. Phenomenals promote and increase manipulative

skill of learners as they have direct contact with nature and its endowments.

Conclusion

It is an undisputed fact that 'science and technology is the only known vehicle for the transformation of any nation to prosperity and the key to this vehicle is science education. Nigeria must take her science education very seriously if her five national objectives must be realized. We must be active participants in the game of globalization. And this is a function of result oriented science education curriculum. The suggestions offered by this paper offer a fresh petal of hope in turning things around. Our country has abundant natural resources which must be converted to wealth and prosperity. Only an effective and efficient science education programme can do this magic. We must start to produce goods and services and not just assembling them from the Western worlds. It is a high time we make our educational system science driven. This among other things involves projecting our science education beyond the present state to pre-eminence^T We must not be strangers in the orbit. We must launch several other satellite into space. We must build our aeroplanes and deadly was planes. We must remain the real giant of Africa.

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