SCIENCE AND TECHNOLOGY EDUCATION: A KEY TO POVERTY ERADICATION IN NIGERIA

Macmillan Mafulul Josiah
Department of Physics,
Federal College of Education,
Pankshin.

Abstract

The living standard in Nigeria can be classified as being below the poverty line, by many indices. Most Nigerian families hardly have access to three balanced diets a day. Majority live in crowded, poorly ventilated houses, not affording even the basic necessities of life. Since science and technology is the bedrock for national development, any nation that lacks adequate scientific and technological knowledge will definitely remain in poverty. This paper, therefore, examines science and technology and how knowledge of such concepts can be useful in alleviating, if not eradicating, poverty in Nigeria.

Human efforts are generally and primarily geared towards the improving quality of life for mankind. The improvement of quality of life in a nation can be achieved through the eradication of poverty. Poverty is a state of destitution in which an individual is unable to meet the basic minimum requirements for food, health, shelter and clothing for himself and his dependants. New Explorer Encyclopedia Dictionary (2006) defined poverty as the state of an individual with insufficient resources and that it ranges from extreme want of necessities to an absence of material comforts. World Bank (2001) described poverty as a state of being poor; and that "to be poor is to be hungry, to lack shelter and clothing, to be sick and not cared for, to be illiterate and not schooled".

Universally, poverty has been classified into three, viz: absolute poverty, relative poverty and material poverty. Absolute poverty is the inability to provide for physical substance such that even human dignity is not protected. The physical substance may include shelter, clothing, food, healthcare services, drinking water, employment and public transportation. Low-income earners such that their marginal propensity to save is zero are said to have absolute poverty. The ability to barely satisfy basic needs as well as other needs is seen as relative poverty. The inability to own physical assets such as land and house is described as material poverty.

Kawu (2012) wrote that the 2010 report of National Bureau of Statistics (NBS) indicated that 112,519 million Nigerians out of an estimated population of

163 million live in relative poverty conditions. The report also indicated that the absolute poverty measure puts the country's poverty at 60.9% or 99,284 Million people, the dollar per day measure puts poverty rate at 61.2%.

Poverty is a global phenomenon that is threatening human survival. According to World Bank (2001) 2.8 billion of the World's population live on less than $2 per day, while 1.2 billion live on less than $1 per day. Dauda & Sarki (2002) are of the view that in sub-Saharan Africa (Nigeria inclusive) the number of people living in poverty is in the increase. Table 1 shows the percentage and population of poor people living on $1.25 per day in some regions of the world. As at 2011, 50.9% of Sub-Saharan Africans live on $1.25 or less per day poverty.

Table 1: Percentage and Population of People Living in $1.25/Day Poverty in Some World Region

Region	% in $1.25 a day poverty	Population (Millions)	Population in $1.25 a day poverty (Millions)
East Asia and Pacific	16.8	1,884	316
Latin America and the Caribean	8.2	550	45
South Asia	40.4	1,476	596
Sub-Saharan Africa	50.9	763	388
Europe and Central Asia	0.04	473	17
Middle East and North Africa	0.04	305	11

Source: World Bank PovcalNet "Replicate the World Bank's Regional Aggregation" at http://research.worldbank. org/ Provo cal Net/povDuplic.html

Statistic shows (Esomonu, 2002) that 70% of Nigerians live below the poverty line. Most of them consume less than 33% of the minimum required protein and vitamins intake because they cannot afford them. World Bank gave the 2007 poverty headcount ratio at less than $1.25 per day and at less than $2 per day for Nigeria as 68.0% and 84.5% respectively (Wikipedia, 2011). Lack of Education is a critical factor in creating poverty. In Nigeria 75% of the extremely poor families have household head as illiterates.

Over the years socio-economic development strategies aimed at improving the conditions of living of poor people in Nigeria have been put forward. Few of such strategies include Operation Feed the Nation (OFN) in 1979, Green Revolution in 1980, Structural Adjustment Programme (SAP) in 1986 and National Poverty Eradication Programme (NAPEP) in 2001. These poverty alleviation programmes,

though laudable, appear to have failed leading to perpetuation of poverty. The National Bureau of Statistics (NBS) report in 2010 showed that in 2004 there was an absolute poverty measure of 54.7% while in 2010 the measure was 60.9%. This was a rise in poverty of 11.3%. Consequently unemployment, underdevelopment, corruption and crime are proliferating. These consequences have adversely affected development.

Eke (2002) opined that poverty in Nigeria has a long history and appears to be increasing with time as a result of the failure of economic development policies. This increase in poverty poses a problem to many Nigerians, especially to the low-income earners and national development. The poverty alleviation programmes initiated over the years have failed because (Eke, 2002) about 50% of Nigerians are uneducated and about 70% of the population of Nigeria live in rural areas devoid of access to infrastructural facilities and social services. Since lack of education is a critical factor in creating poverty, educating Nigerians will assist in fortifying them against poverty. When this is achieved there will be national development. Science and technology is said to be the bedrock for national development and any nation that lacks adequate scientific and technological knowledge will definitely remain in abject poverty.

Science and Technology Concepts

Webster's New Explorer Encyclopedia Dictionary (2006) defined science as knowledge or a system of knowledge covering general truths or the operation of general laws especially as obtained and tested through scientific method. Such knowledge or system of knowledge is concerned with the physical world and its phenomenon. Some people view science as an organized body of knowledge that is acquired through systemic observation and phenomena.

Of recent though, science has been considered as a most successful enterprise participated in by human beings. This recent view of science is attested to by Agbo (2000:1) who said that science

> could also mean a way of doing things which consists of its products, processes and attitudes. The products of science are facts, concepts, principles, laws, theories and generalization while processes of science are observation, classification, measurement, quantifying, data gathering, communicating with models, pictures, tables, graphs, diagrams, histograms, bar charts and pie charts, inferring, hypothesizing. The important attitudes that underlie the scientific enterprise are curiosity, open-mindedness, objectivity, intellectual honesty, rationality, willingness to suspend judgment, humility and critical mindedness.

Webster's New Explorer Encyclopedia Dictionary (2006) defined technology as "the practical application of knowledge especially in a particular area". Such applied knowledge is regarded as science. Ankeli (2010) viewed technology a practically-oriented. So technology may

be considered as the application of principles, laws and concepts of science for the benefit of man. This implies that knowledge and skills of science are transforming the product and materials necessary for the society into practical use. Technology, which is directed towards solving human problems, is now applicable to all aspects of human activities, ranging from art to medical sciences, banking and manufacturing (Nwokolo, 2002).

The aims and objectives of science and technology can best be achieved through education (science and technology education). Science education refers to the teaching and learning of science subjects (Biology chemistry, Physics). Technology education refers to the teaching and learning of all technology-related courses, such as Electronic/Electrical Engineering and Mechanical Engineering, which could lead to vocation or self-employment. The inclusion of science and technology education in Nigerian educational curriculum and the priority given to science students over arts students in the ratio 60:40 during admission into Nigerian institutions lays enormous emphasis on the need for the effective teaching and learning of science and technology in schools.

Causes of Poverty in Nigeria

Inequality of income distribution is one of the causes of poverty in Nigeria. While some individuals earn very high income due to their high educational and professional background, the size of their talents and inheritance, others earn very low income due to discrimination and low educational background.

Poverty is also a result of the quality of the society's labour force, its stock capital and the state of her science and technology. United Nations Educational, Scientific and Cultural Organization (UNESCO) has assisted Nigeria in implementing a 'Teachers Education Enrichment Programme' as a consequence of the ugly scenario in Nigeria's educational system, especially in science and technology. Due to the poor state of Nigeria's educational system particularly in Science, Technology and Mathematics (STEM), her abundant human and natural resources are still under- developed.

Other causes of poverty in Nigeria are unemployment and under employment. Narayan, D.,Patel, R., Schafft, K., Rademacher, A & Knoch-Schulte, S (2000) wrote that poverty assumes an acute dimension when there is unemployment and underemployment. For Nigeria, the country's unemployment rate is 3.2% (Awowede, 1998). According to this report, unemployment is based on worsening national economy, mass retrenchment of workers in the work force and increasing failures in the business world. When one has low earning or no earning at all, he cannot provide for himself and his dependants the basic necessities of life.

Underemployment also accounts for poverty in Nigeria. Awowede (1998) reports the International Labour Organization (ILO) as saying that underemployment is a situation where

individuals make do with jobs below their skills and competence, a lower-paying, less-fulfilling job, rather than stay out of work.

The implication is that, with underemployment, there is job dissatisfaction. Characterized by low pay and less fulfillment, such jobs do not permit achievement in terms of providing the employee and his dependants with the basic requirements for livelihood. Poverty thus stares such underemployed worker and his dependants in the face.

Science and Technology Education for Poverty Eradication

The quality of education which a nation makes available to its citizenry may be measured in terms of how purposeful the learning experiences derived therefrom can be transformed into fashioning out a meaningful subsistence economy for that nation. Over the ears, science and technology has been the effective agent to the socio-economic development of nations (Nwokolo, 2002). Therefore, for science and technology to effectively eradicate poverty in Nigeria the products and processes of science must be taught and learned by all Nigerians. Also, the attitudes of science such as critical-mindedness, humility and honesty must be inculcated into Nigerians. For giant strides to be achieved in the socio-economic development of Nigeria, the products, processes and attitudes of science must not only be taught right from the primary school, but science attitudes must be imbibed in the teaching. As the child graduates from primary school, science becomes a part of him. Even as he grows into adulthood he is able to use the science to solve humanity's problems.

Nigeria is endowed with vast natural resources which need to be harnessed for the benefit of man. According to Federal Ministry of Science and Technology (1986) science and technology are means to harnessing the forces of nature in other to explore the raw materials, with which nature endows man, into goods and services for better quality of life. Certainly, there can be no self-reliance and national development in Nigeria unless most (if not all) citizens are educated in science. Science and technology courses are now beginning to be viewed as entrepreneurial. Some of the entrepreneurial opportunities that abound in science and technology are (Achor, 2010):

1. **Biology**
   a. Fermentation of yeast
   b. Zoo/Biological garden
   c. Flower breeding and distribution
   d. Fish pond for fish breeding

2. **Chemistry**
   a. Extraction of colour from flowers and leaves as reagents
   b. Production of dyes
   c. Production of fumigants/insecticides
   d. Production of soap
   e. Production of food preservatives
   f. Production of neutralizers
   g. Pure water production
   h. Electroplating/coating
   i. Production of distilled water

3. **Physics**
   a. Radio/television repairs
   b. Solar panel production
   c. Automatic voltage regulators/ stabilizers
   d. Production of smaller transformers

4. **Computer Science**
   a. Operating computer
   b. Programming the computer
   c. Designing computer software
   d. Repairing/servicing computer
   e. Operating cyber café
   f. Training people in computer applications
   g. Analyzing data for researchers using computer packages

5. **Agricultural Science**
   a. Crop production for sale as food
   b. Cotton/crop production for use in industries
   c. Breeding fish in ponds for food
   d. Breeding animals/poultry for sale
   e. Production of manure
   f. Production of animal feeds
   g. Production of hybrid seeds

6. **Technology/Technical Education**
   a. Preparing building plans
   b. Production of furniture
   c. Coiling and recoiling of smaller transformers
   d. Electrical wiring of houses
   e. Repairing vehicles
   f. Key duplicating
   g. Welding/fabrication
   h. Erecting buildings/block molding
   i. Repairing handsets
   j. Servicing generators
   k. Charging batteries

Knowledge of Physics also enables a man to repair electronic devices such as calculators and embark on electrical wiring of houses. He can also produce laboratory equipment such as standard resistors and knife edges for sale to schools. A man who has knowledge of Chemistry can also produce pomade for sale.

There may be no end to the entrepreneurial opportunities in science and technology education. If grasped, these opportunities can uplift the socio-economic status of Nigerians. When that is achieved Nigeria would be said to have been developed.

Conclusion

The agonizing experience of being unable to satisfy the basic needs of one's nuclear family due to unemployment, underemployment or illiteracy exerts an excruciating aberration on the psyche of the afflicted. It is, therefore, essential for science and technology education to be inculcated in Nigerians, more so that science and technology has long since been identified as the bedrock for the socio-economic development of any nation. Socio-economic growth contributes to the eradication of poverty in any nation.

Recommendations

Poverty in Nigeria will be alleviated, if not eradicated, and the socio-economic status of its citizens will be enhanced if the following recommendations are adhered to:

1. Nigeria is endowed with many natural resources which, when

harnessed and managed effectively, will ensure development in the socio-economic sector of the nation. This will eradicate poverty in the lives of the many Nigerians living in abject poverty.

2. Science attitude, rather than corruption and dishonesty, must be inculcated in the minds of Nigerians. It must be seen as part of their lives if poverty is to be completely eradicated in the nation.
3. Few industries exist in Nigeria as a result of the unreliable and irrational power supply. The state of power supply must be improved upon for industries to be functional, as more and functional industries imply employment for jobless and/or underemployed Nigerians.
4. An individual who is scientifically and technologically educated can be self-reliant. Such an individual need wait for Government work if it is not forthcoming. He can embark on a small-scale entrepreneur which, if managed effectively, can grow into a large-scale one.
5. Government should honestly professionalize teaching. Doing so will improve the standard of science and technology education as trained and experienced professionals are bound to provide effective management for optimal results.

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