

SCIENCE AND TECHNOLOGY EDUCATION: IMPLICATION FOR POVERTY ALLEVIATION IN NIGERIA IN THE 21ST CENTURY

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Abstract

The issue of alleviating or eradicating poverty in Nigeria has been a national problem in the past years. The Federal Government had employed many means to see if they can alleviate or eradicate some of the problems. This paper looked critically on science and technology education, objectives and provision of science and technology in school curriculum and how application of science and technology have tried to alleviate some problems of the people in areas of food production, health care, housing, communication and as well as transportation.

Introduction

Emovon (1985) defined science as a dynamic and objective process of seeking knowledge through observation and systematic experimentation and also a way of explaining events and phenomena in nature. Science is defined as dynamic human activity concerned with understanding the working of our world (Ogunnyi, 1986). UNESCO (1986) saw science as a universal theory and account of the natural world, which if true for anyone, is true for everyone. Science is made to transcend across racial, cultural, tribal, religious and other social barriers. It is a relentless, continuously, never-ending attempt to find more accurate descriptions of things and events. Science has valuable contributions to make the unit group of people who traditionally described and theorized the natural world in quite different ways. Dienye and Gbamanja (1990) defined science education as the study of the interrelationship between science as the discipline and application of educational principles to its understanding, teaching and learning.

According to Nwachukwu (1981) technology is seen as an evolutionary process in man's thinking, culture and work taking place over many years. Technology is defined as means or activity by which man seeks to change or manipulate his environment (Orukotan, 1995). Awokoya (1997) pointed out that technology involved the systematic study of the methods and techniques employed in the industry, research, agriculture and commerce to improve the life of man in the environment. Technology played a crucial role in establishing a modern industrial economy, while technology education contributed to the creation of a modern society; which hopefully overcome some of the more traditional social divisions (UNESCO, 1986). As science and technology directly affects education, educational scientific research throws more light on the teaching and learning process while technology education provides the more effective media that increases the efficiency of teaching and learning. Science education gives the people true knowledge and liberates them from superstition and ignorance while technology education provides them with the ideas to control over the material world. Science and technology education can be successfully implemented at all levels of education if teachers use suitable and adequate illustrations to emphasize on their application.

Objectives of the Provision of Science and Technology Education in the Curriculum

Abubakar (1969) pointed out that more emphasis had been given to the study of science and technology in the school curriculum. It was only in 1986 that National Policy on Science and Technology stated that "Educational system shall emphasize science at all levels". The objectives of the policy is to re-orient the entire society towards scientific thinking in order to develop new technologies and adapt existing ones to improve social well-being and security. The aims of science and technology education in teaching and learning in schools include:

(i) Helping the individual to analyze the nature of science so as to achieve the stated objectives.

(ii) Analyzing the basic educational concepts.

(iii) Analyzing the class of science like scientific truth, ethics and theories.

(iv) Providing individuals with some science background knowledge.

The objectives of science and technology education in primary school as Stated by Bybee, R.W.; Buchwald, C.E.; Crissman, G.; Heil, D.K.; Kuerbis, P.H.; Matsumote, C. and McLnemege, J.D.(1989) include the following:

(1) Develop the student's natural curiosity.

Broaden the student's operational skills for investigating the world, solving problems and making decisions.

Increase the student's knowledge base.

Ensure the student's understanding of the limits and possibilities of science and technology in explaining the natural world and solving human problems.

Develop the student's understanding of the nature of science and technology.

The above goals are congruent with students developing understanding of the world. They represent science and technology as ways of knowing about and solving problems of the world. To achieve the above stated objectives, UNESCO (1981) and National Policy on Science and Technology (1986) listed some provisions to be made for proper implementation such as:

Providing adequate teaching materials such as textbooks and laboratory aids.

Providing well-trained and well-motivated science teachers and technicians.

Introducing gainful practical activities such as model-making, handicrafts.

Publishing materials relating to the teaching of science and technology.

Assisting the local development of teaching materials in science and technology education.

(6) Establishing scientific and industrial research centres to make effective utilization of the benefits of science and technology.

Application of Science and Technology in Alleviating the Poverty of the People

Science and technology had contributed immensely to the satisfaction of the basic needs of the people. The application of science and technology have made great reduction in the rates of infants mortality, raising average life span and improving technologies of building and construction as well as communication transportation and food production (Orukotan, 1995). The impact of science and technology in the national development include the following:

Food Production/Agriculture

Agriculture has been the largest single source of earnings in the villages and it is the bedrock on which their economy rests (Abubakar, 1969). The application of science and technology has served to increase our food and agricultural production and thereby improving the standards of livelihood of the people at lower cost (Orukotan, 1995). The science and technology have improved the food production of the people through the following:

- (i) Mechanizing agriculture by introduction of agricultural machinery such as tractors, ploughs, planters, cultivators, sprayers, and threshing equipment.
- (ii) Increasing the potential arable land and lengthening the farming period by developing irrigation schemes and water conservation techniques.
- (iii) Encouraging the utilization of nitrogenous and phosphorous fertilizers at reduced price.
- (iv) Harvested crops were preserved by the use of chemicals and improved storage facilities and thereby ensured the continuity of food supply throughout the year. Fishing in the high sea was carried out by scientific methods such as use of motor propelled fishing trawler in Niger-Delta region. The scientific method of breeding was made possible for the increased growth rate of cattle and increasing milk output.

Health Care

According to World Health Organization, human health is the state of complete physical, mental and social well being, when there is absence of disease or infirmity (UNESCO, 1986). The people must be physically and mentally fit to carry out the day's work. The economic wealth of any nation depends on the well being of the people. With the application of science and technology, the Federal Government has built more hospitals and health centres, free medical services to improve the people's health. The greatest health problem in the country has been the high infant mortality. Over seventy-five percent of children die of malaria, pneumonia or gastroenteritis before they were one year old. The introduction of free medical care, mobile doctors and health workers, vaccination in the rural areas have reduced the incidence of such epidemic diseases such as small pox, polio, measles and chickenpox among the children (Makulu, 1971). One

influential school of thought argued that the technologies of prevention were far more effective investment than technologies to treat or to .Cure people who have succumbed to illness (UNESCO, 1986).. Obviously, standard of diet, nutrition, provision of good housing facilities and electricity, availability of reliable and safe water will reduce the rate of mortality among the people. The diseases that were responsible for the untimely loss of young men were the kidney disease and tetanus (Fashola, 1969). Science had made available artificial kidney for transplanting and use of antibiotics to combat microorganisms that threatened our existence on this planet. Pain relieving drugs, like Panadol and Aspirin, were introduced to alleviate our ill health.

Housing

The most basic needs of the people is shelter. The problem of today is how the government can provide decent living accommodation for the ever- increasing population of the people at a cost within the reach of average individual. In 1960, Buckminster Fuller pointed out that the answer to the housing problem lay on the way to the moon (UNESCO, 1986). According to Buckminster Fuller, the answer was technological problem that required the application of scientific and technological solutions. As the research programme of space exploration increased, new materials and new construction techniques were invented, adapted and applied for the construction of low-cost high-performance housing for the people in the rural areas. A lot of research has been directed towards the development of new construction techniques and constructional plants, equipment and materials that will be cheaper and suitable for the people (Fashola, 1969 and STAN, 2001). For instance, research development of Federal Ministry of Works and Housing (FMW & H), recently carried out scientific investigation on the suitability of the periwinkle shells and palm kernels for use as building materials. In the recent past, there was a limit to which a dwelling house could rise. Through the, use of science and technology, the government provided low costs buildings with suitable foundations for the people in the Niger-delta region of the country.

Transportation

Improved technology has made it possible for the people to have accessible roads. The improved transportation networks have promoted better trade and inter-city travel. The recent adaptation of certain percentage of the national budget for road construction and maintenance, have made people to have access to the most remote parts of the country. Feeder roads with the rural areas joined these road networks linking all state capitals and principal cities. Some of the roads were still sub-standard, with the recent announcement by thy president; plans were underway to improve them to international standard. The construction of roads helped the flow of traffic and thereby reduced the prevailing difficulties in evacuating produce from the remote-areas to the urban cities. Our shallow rivers had been made navigable by dredging or by construction of training walls through estuaries to restrict the flow into channels (UNESCO, 1986 and Fashola, 1969). Dams were constructed across the rivers to provide cheap electricity and water for irrigation for far distant places where there is no water.

Communication

Space science has reduced the distance around the world. Communication between one state capital and the other state capitals in Nigeria could be achieved within seconds. Communication has" improved tremendously through the use of satellites and telephones have telescoped the distance between two people in different countries (Orukotan, 1986). Through satellite television links; information can reach a whole hemisphere of the world. Computers of various sizes, shapes and function processes transmit information that could take human brain a generation to process within few, seconds. In early 90^s, messages were carried by post, radio and telegrams but due to improved communication, modem information gadget like E-mail and Internet services and Fax are used to send information around the world within few seconds. This improved communication has brought far distances very close and reduced the danger and risk in the roads.

Conclusion

The national purpose from which the educational purpose is derived entails national development in the areas of better living conditions, healthier and happier individuals, improved transportation and communication network. Science and technology have played prominent roles in alleviating the poverty of the people. The strength of any nation depends on its level of technological development. The people's livelihood

have been influenced by Science and technology in such a way that both federal and state government should encourage teaching and learning science at all levels.

Finally, the application of science and technology has improved the quality of livelihood of Nigerians in the area of housing, food production, communication, health care and transportation. The federal and state governments should endeavour to improve in the areas of health care by providing drugs in hospitals and health centres, building more low-cost houses and buying more buses for transportation in order to alleviate or eradicate poverty among the people in rural areas.

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