International Journal of Scientific Research in Education, JUNE 2016, Vol. 9(2), 97-104.

International Journal of Scientific Research in Education (IJSRE)
ISSN: 1117-3259

Managing the Role of Science and Technology Education Programs in Promoting Enterprises for National Development in Nigeria

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Abstract

This article focused on the identification of possible strategies of promoting science and technology education programs for enhanced service delivery in developing enterprises in Nigeria.Science and technology has employed numerous strategies to promote the development of enterprises in other to ensure that the rising number of unemployed youths and economically productive adult population are gainfully engaged in meaningful national development. This theoretical articleevaluates the meaning and concept of science and technology education, the need for it, and its relationship with industries in national development and survival of man, as well as the strategies for implementation and the benefits. The paper recommends among others, that adequate instructional materials for the teaching science and technology education should be made available to give room for more practical classes than theory, which should be adequately supervised. More professional teachers in science and technology should be employed and government should make provision for improved funding for science and technology education. It concludes that science and technology has helped citizens in modern times to have faith in their ability to feed and defendthemselves.

Keywords: Science and Technology, Education, Enterprises, National Development, Nigeria.

Reference to this paper should be made as follows:

Osam, I. (2016). Managing the Role of Science and Technology Education Programs in Promoting Enterprises for National Development in Nigeri. *International Journal of Scientific Research in Education*, *9*(2), 97-104. Retrieved [DATE] from http://www.ijsre.com

INTRODUCTION

Modern societies are dominated and driven by ideas and products from science and technology (S&T) and it is very likely that the influence of science and technology on our lives will continue to increase in the years to come. Scientific and technological knowledge, skills and artefacts invade all realms of life in modern society. The workplace and the public sphere are increasingly dependent on new as well as upon more established technologies. Scientific and technological knowledge and skills are crucial for most of our actions and decisions as workers, voters, consumers, etc. Meaningful and independent participation in modern democracies assumes ability to judge the evidence and arguments associated with the many socio-scientific issues that appear on the political agenda (Sjøberg, 2002).

Development at any phase is always linked with technology and technology happens when there is advancement in science. Hence science, technology and development are all proportional to each other (Pujari, 2014).Science and Technology are tools that solve quite readily the numerous challenges people face in life on daily bases(Sjøberg, 2002). In a country like Nigeria, which seeks to improve the quality of life of all her citizens, this involves attempting to solve the many problems facing her population. These problems include ill health, illiteracy, public utilities, inadequate education facilities, hunger and unemployment. Others are general security of life and properties, youth restiveness, poor industrial and communication infrastructure and corruption.

These problems acting either individually or collectively hinder development by making the people less capable of making meaningful contribution to national development. The problems also weaken determination and motivation of the people for self-reliance. However, science and technology have helped humans conquer many problems they face in their struggle for survival in their environment (Ololube, 2013). It has also in recent time, become powerful tools for resolving our numerous problems world-wide. Science and technology has done a great deal in the transformation of Nigeria and other countries of the world.The creation of different types of industries and services such as hospitals, education institutions and banking etc. are all the good hand of science and technology. A well-articulated and implemented science and technology education programs will transform the country to a high competitive and dynamic knowledge based economy, promote positive enterprise culture; create employment for youths and productive adults. It will empower students to take control of their own learning (focus in master learning) and empower them to maximize their capabilities, and find joy in learning.

CONCEPT OF MODERN SCIENCE AND TECHNOLOGY

Science emerged as human's invented ways of organizing their experiences. The ways of organizing human experiences has been described as major branches of knowledge, which help us to resolve or at least reduce the numerous anxieties that results from conflicts and problems of our daily experiences, while technology is said to be the systemic application of knowledge of technique gained from science in producing and making use of materials like machines, tools, weapons etc., it deals with the application of knowledge in providing solution to practical problems of humans and their environment. Consequently, it is safe to say that science and technology are twin terms that are closely related.

Furthermore, science is concerned with the search for and understanding of knowledge about nature, technology deals with the scientific application of knowledge in the solution of

practical problems of everyday living. The product of science are ideas, theories and principles arrived at through a process of continuous enquiry, guess, devices, procedures, processes and materials, which are usually but not always derived from science. According to Auta (1995) modern technology featured during the metal or iron age which was characterized by the introduction of modern techniques of agriculture, warfare, transportation, communication, commerce, development of complicated manufacturing and industrial processes and rapid architectural development. However, Bolye (2011) opined that traditional technology is characterized by crude method of production with little boosting mass production and producing standardized manufactured products, the qualities that have distinguished modern technology from traditional technology.

OBJECTIVES AND GOALS OF SCIENCE AND TECHNOLOGY

The development of enterprises is tied to the national goals of Nigeria as a developing country. Federal Republic of Nigeria (2004) identified the national goals of Nigeria to include among other things the building of:

- Free and democratic society;
- Just and egalitarian society;
- United, strong and self-reliant nation;
- A great and dynamic economy; and
- A land full of bright opportunities for all citizens.

Consequently, the objectives and goals of science and technological education in promoting national enterprises include among other things to:

- Enhance the country's image;
- Expands Nigeria technological framework;
- Reduce poverty at local community level;
- Create wealth and employment opportunities;
- Enhance local production of goods and services; and
- Generate appreciable income.

Apparently, the ultimate aim of science and technology education is to improve the poor living conditions of people in a nation. Wilcocks(2013) stated that the ultimate objective of development is to help to improve the living conditions of poor people in society especially in a country, to guarantee the people adequate food and water for basic needs, health and to help equip them with the knowledge which essential to empower themselves to build a better future. Federal Republic of Nigeria (2004) documented among other things the educational processes for the promotion of community development enterprises:

- Life-long education shall be the basis of the nation's educational policy;
- Education and training facilities shall continue to be expanded in response to societal needs and made progressively accessible to afford the individual a far more diversified and flexible choice;

- Educational activities shall be centered on the learner for maximum self-development and self-fulfillment;
- Efforts shall be made to relate education to overall community needs.

Accordingly, to reap the rewards of science and technology, the quality of science and technology education should focus on establishing the values of acquisition of new ideas, knowledge, skills and competence, which must be relevant enough to the prevailing economic realities of amodern society. A lot of educational processes have to be followed in an attempt to promote meaningful national development enterprises.

SCIENCE AND TECHNOLOGY AND INDUSTRIES

The relationship between science and technology and industries is such that the dividing line between them is very thin. Industrial development of any nation depends very highly on the level of advanced science and technology that the nation had achieved. It is worth while to note that science and technology are prime instruments in the exploitation of resources for human use.

The stage of technology advancement in Nigeria has been possible through science and technology. Water resources, for example, has been utilized and transformed into hydro-electric power on River Niger at Kainji Dam. Specialized human resources, sophisticated equipment and geological surveys are essential tools for locating and exploiting minerals. Some technicalities like prospecting (geological survey of potential mineral locations), drilling, refining and transportation are required in exploitation and development of natural resources. These processes are attained through advances in science and technology. Other natural resources that have been exploited and developed for technological progress and economic development are petroleum, forest (for fuel, pulp and paper, timber and ply-wood at Sapele) iron ore (for production of steel at Aladja and Ajaokuta) and limestone (for production of cement at Sokoto, Abeaokuta and Nkalagu). Onuolu in Bolye (2011) posited that the consumer good industries have constituted the early stage of modern industrial development in Nigeria. They range from small to medium scale industries using mainly local agricultural raw materials for processing activities. The modern industries employ higher level of technology than traditional industries. Abdulahi (1995) notes that there are non-food processing industries like textiles, located in Ibadan and Kaduna. Plastic in Western States of Ondo and Oyo, soap and cigarettes in Ibadan and Kaduna etc., these industries are among the fastest growing industries in Nigeria and have benefited from the rapid growth of the market and investment in science and technology.

In the same vain, better understanding of the principles of hygiene and public health, e.g. EPI and other health programmes, infant mortality is drastically reduced, and most mothers who ensure that there babies get immunized against killer diseases are happy to watch their babies grow without fear and recourse for emergencies, which was very rampant in the past. All these are wonders of science and technology which has greatly influenced family life and have brought about high standard of living for families in Nigeria.

STRATEGIES FOR IMPLEMENTATION

Over the years, there has been huge gap between policy formulation and policy implementation. Beautiful policies are put forward on paper but they fail at the level of implementation (Abraham 2004). Successive governments in Nigeria most of the timeare insensitive to the plight of the

people even when there are means for improvement and development. Bad policy or poor policy implementation may adversely affect national development.

The world is now said to be a global village due to the discovery of computer and ICT and other related technologies. However, many Nigerians students in secondary schools are faced with various problems in their attempts to computerize science and technology activities. These include negative attitude and procedures, internal and external obstacles.

According to Ogunsola (2008) the real task facing the institutions, among others include to reposition the policy initiatives and priorities of key players to map out a practical and achievable developmental agenda for the introduction and application of ICT in these institutions. Lack of adequate infrastructure to boost new ICT technologies and limited resources in developing nations, has been identified as problems militating against schools to fully participate in international activities arising from ICT induced globalization.

Inadequate external and internal training programs, absence of systematized plans for integrating technology into teaching and learning, inadequate human resources base for implementation or technical projects especially in the rapid and progressing technology field.However, the way forward includes:

- Adequate funds should be provided for in-service training, purchase of ICT resources and its regular maintenance;
- Ministry of education should integrate Information Technology to secondary schools;
- Monitoring bodies (supervisors) should be made up of experts for science and technology development;
- Relevant educational bodies (institutions) should embark on massive in-service training of teachers and technicians and constantly organize national, state and local government workshops, seminars and conferences on science and technology;
- Provision of solar energy to schools and other institutions of technology should be encouraged instead of relying on public power. Electricity is needed to run the machines and equipment in science and technology laboratories and workshops.

BENEFITS/NEEDS FOR SCIENCE AND TECHNOLOGY EDUCATION

Countries in the west(developed countries) place high premium on science and technology. Even economies which we regard as developed are not very comfortable with where they are and as such are continuously seeking ways to better their lots (Ololube, 2006a).

Sustainable national development can be achieved through enhanced science and technology education programs. The core concerns created in teaching science and technology education to students is for them to take more responsibility for themselves and their learning, to try to achieve their goals, be creative, discover existing opportunities and in general cope with the complex environments they find themselves (Ololube, 2006b).

Science and technology is an all-embracing concept that will boost sustainable development and create wealth through industrialization for everyone. Training in science and technology has been used by countries (e.g., Japan, France, Germany, Norway, China, Finland, UK, USA.) to set up unique educational oriented outfit programs, inculcating discovery and innovating spirit, deliberately targeted at youths. These potential youths (students) are encouraged to seek out ideas, and subsequently develop the promising ones from invention phase to commercialization.

Science and technology have played prominent role in the development of human resources. It is generally agreed that technology cannot be bought, borrowed, stolen or even transferred, but a culture that has to be developed from within (Geofrey, 2012).Geofreyfurther argued that if technology has to take place, grow and come to fruition, it has to be implanted right from the primary school stage. For the development of human resources in Nigeria, the Ashby Commission Report gave an encouragement to the development of science and technology by directing that university enrolment should be in the proportion of 60 to 40 percent for the Arts-based course. With science and Technology programmes, instructions in schools are now made easier with provision and precision of video-visual devices like radio, television, projectors, film etc. It also helped to broaden the fields of knowledge to the extent that human resources are developed to the fullest.

Specialization and quality of products are the aftermath of the emergence of science and technology. Nigeria can now boast of producing thousands of medical doctors, engineers, lawyers, teachers, architects and technologists.

Science and technology has empowered students with the competencies and skills necessary to prepare them to respond to their life needs including running their own business, so that they become productive citizens etc. Science and technology hasvaried models to suit each country; not one-size-fits all approach and to give young people the opportunity to develop skills.

A well implemented science and technology program will aid the expansion of economic activities of the nation and equip the youths with the knowledge and skills that will enable them compete favorably in the technologically driven globalized societies. George (2009) observed that the introduction of science and technology education programs in the nation's education curriculum stands to benefit several stake holders in education system, among them are students, teachers, school administrators, the government and humanity as a whole. He included that it will offer the much needed functional education to the youths and makes them self-reliant. While Greg (2011) also presents the benefits of science and technology education to include, offering graduates with adequate training that will enable them to be creative and innovative in identifying novel opportunities and providing them with adequate training in risk management. He agreed that the benefits will embrace fostering economic growth, increase productivity, creation of new technologies, produce services and rejuvenate better approach to prevailing environmental problems. Science and technology education thereforeshould be universally available to provide students with opportunity to explore and fulfill their potentials.

CONCLUSION

Science and technology is a lifelong experience that opens opportunities for self-reliance. A nation that has science and technology deficiency will find it difficult to industrialize and grow economically. Therefore youths should be encouraged to embrace science and technology education studies with open mind because it is a sure way that will benefit the entire nation. The government on their own part should be aware that this generation, by all means, want to play significant role in eliminating poverty, improving their communities vis-à-vis the nation and creating the future through innovation, imagination and opportunity recognition. Subsequently science and technology education is the answer to national dreams and thereby need to be properly guided, managed and funded for effective implementation for national economic growth.

7.1 Recommendation

However, for the programs of science and technological education to thrive in Nigeria, serious support and commitment by government is highly required. The ultimate goal of government should be to enhance technology studies by ensuring high quality teaching, provision of adequate funds, facilities and materials for students to practically demonstrate their knowledge.Without mincing words:

- Government should adequately fund science and technology education, so as to train and retrain professionals and qualified teachers for functional science and technology education;
- Government should equip science schools with laboratories and technological facilities and equipment for effective science and technology education programs;
- Non-governmental organizations should join hands together in sponsoring teachers for both national and international conferences;
- There should be awareness campaign to sensitize the citizenry on the benefits of technology education;
- Secondary school principals should try as much as possible to establish school industrial linkage for effective practical.

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