

SCIENCE AND TECHNOLOGY EDUCATION: PANACEA FOR SELF RELIANCE AND SUSTAINABLE TECHNOLOGY DEVELOPMENT IN NIGERIA

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ABSTRACT

One of the fundamental principles in National Policy on Education is to engender knowledge, effort, skill and wellbeing of citizens for national development. Science and technology education in Nigeria incorporates industrial development, provide institutional framework for economic efficiency and reduce technological dependence on developed nations. The delivery of education, especially technology education has suffered from years of neglect, compounded by inadequate attention to policy framework, poor funding and staffing, insufficient equipment and facilities, incomprehensive practical experience which did not give way for self-reliance and productivity for sustainable national development. This paper highlights the concept of science and technology, self-reliance for sustainable development, strategies for enhancing science and technology, and recommendations for the enhancement of science and technology for self actualization.

INTRODUCTION

Science and Technology education globally is a veritable tool for sustainable development and a spring board to socio-economic growth. It can also be viewed as an investment in human capital and education for full living (Osun,2009). In other words, science and technology education is designed to develop skills, abilities understanding, attitudes, work habit and appreciation of knowledge and information needed for the world of work. Oranu (2007) opined that science and technology education encompass mental and practical skills to sustain an individual and his immediate environment. Various developed nations such as Britain, United States of America, Japan, China and India have embedded science and technology education into their educational system, in their early existence as a nation. Adeyemi (2007) acknowledges that through science and technology education, these countries were able to have rapid industrialization, accumulation of economic surplus, social equity and low level of unemployment. If Nigeria must not be tagged a developing country, focus must be directed on science and technology education. Aina (2008) observed that the role of

science and technology education in the reform initiatives of Nigeria is not clearly defined.

Aina expressed dismay that there has been a continued mismatch between the nations' developmental aspirations and her educational policies and practices. Aina further stated that the recent development in Nigeria whereby a substantial section of the society remains unemployed, calls for a great concern among every well meaning Nigerian. Consequently, less than 75% of the universities, polytechnics, colleges of education and other school leavers roam the streets in both urban and rural areas without any defined mode of living; this has heightened the need for emphasis on science and technology education for individual and national survival (UNICEF 2008). Therefore, for a sustainable technology development in Nigeria, Science and Technology education must be given higher priorities.

CONCEPT OF SCIENCE AND TECHNOLOGY EDUCATION

It is pertinent to discuss the concept of science and technology education for comprehensive understanding. Nigeria's National policy on Education (2004) seeks among other things to create and promote self realization, better human relationship, individual and national efficiency, effective citizenship, national consciousness, national unity, as well as socio-cultural, economic, political, scientific and technological advancement. Education is defined by Oranu (2007) as a learning process that ushers in relatively permanent change in behavior or capability that result from experience. In other words, education is an aspect of the many vital processes of socialization by which people acquire behaviors essential for effective participation in the society.

Nevertheless, the knowledge education offers is all about life, our environment and the entire universe. On the other hand, Okafor (2011) viewed science as the most powerful tool for man's development. Thus, science education is a field of study concerned with the production of scientific literate society, capable of national development. In line with the view of Okafor, Rutherford (2009) maintained that science education helps students to develop the habit, understanding and mind which they need to become compassionate human beings that are able to think and face the realities of life. The above facts about science education are contained in the relevant objectives of science education as stipulated in the national policy on education; thus, to produce scientists for national development and to service studies in technology and technological

developments which effectively remain paramount to many professions such as medicine, pharmacy, engineering, computer programming and such like.

On the other hand, technology is a science that focuses on the use of practical skills to produce useful goods. Technology education can be referred to as any education which is necessary for effective employment in occupation which will eventually lead to wealth creation and self reliance (Nwokoye,2011). It is a systematic way of exposing individuals to practical task for developing and producing goods and services to meet the needs and wants of man (Ibeneme, 2010). It deals with developing devices, processes and product designed to control nature for the benefits of man. Technology Education is a necessary factor for improving efficiency, quality of life and increasing the chances of survival. Thus, science, technology and society are interrelated and inseparable. Eyibe (2005) also explained that technology education consists of scientific, technological and engineering knowledge and other forms of technical know-how that is brought to bear on materials to produce goods, services and generate further knowledge. Okafor (2011), noted that Nigeria is currently in need of quality science and technology education to alleviate poverty, attain self reliance and sustainable national development. This can be achieved by quality science and technology education which has gone far to improve the living standard of people in all spheres of life as seen in portable hand tool, machine fittings production, medicine, transport and communication. In agreement to this fact, water, solar energy, shelter, security equipments, health facilities and education has been identified by Saha (2006) as areas where science and technology exercise great ability to satisfy the technological excellence and economic self reliance of an individual and society at large. In other words, this offers the beneficiaries the ability to be self reliant and employers of labour.

SELF-RELIANCE AND SUSTAINABLE NATIONAL DEVELOPMENT

Self-reliance refers to the sole dependence of individual capabilities to improve life. It is the ability of an individual to rely on him/her self in order to accomplish a specific task and progress in it (Nwokoye 2011). Acquisition of employable skills and benefits that accrues from it, engender self actualization and job satisfaction which on the long run can lead to sustainable development.

Sustainable development is conceived by Abudulkadir (2011), as those infrastructures, policies and behaviors that are conceptualized, instituted and maintained over a period of time. These infrastructures are considered essential to the general welfare and

continued existence of the people and their immediate environment, such as housing, recreational facilities, agriculture, good roads, water, mineral resources, electricity, schools, industries, transportation, domestic services and good governance. Sustainable development is therefore, a continuous and progressive increase and expansion of the volume of goods and service provided in a given economy which could lead to improvement in the social, political and economic life of the present, as well as the future generation. It can be said that countries that achieved this status, experience good governance; because good governance provides adequate and sufficient social services required by the citizen for self-reliance and sustainable development. Science and technology education can promote self reliance and sustainable development in Nigeria if some of the following strategies are adapted or adopted by stakeholders.

STRATEGIES FOR ENHANCING SCIENCE AND TECHNOLOGY EDUCATION IN NIGERIA

CONTINUITY OF GOVERNMENT POLICY

The rapid industrialization of any nation is tied to acquisition of knowledge and skill in science and technology for sustainable development; but unfortunately in Nigeria, the zeal to advance in these areas is bridged by change of government and disrupted policy. It is pertinent to note that irrespective of the government on board, there should be continuity in policies already established by the government for science and technology education. No democratic government should abandon uncompleted or old project in place of new ones in order to enhance continuity in policies set up for the education system.

CONSTANT REVISION OF CURRICULUM

If curriculum should at all times change with the needs, interests, aspirations and priorities of any society, it is expected that any shift in priorities as a result of changing social needs, will require corresponding changes in the curriculum; but unfortunately, curriculum changes in Nigeria schools are often static, in contrast to modern curriculum requirement for a dynamic society.

ADEQUATE FUNDING AND ARTICULATED MANAGEMENT

The high rate of technological advancement across the globe necessitated the need for increase in funding of science and technology education. This will enable academic institutions search for qualified personnels procure instructional materials, equipments and other facilities. There should be improvement in the release and management of

funds. This implies that allocation of fund for science and technology education should be released on time and appropriately in order to avoid diversion of funds.

IMPROVEMENT OF STAFFING AND STAFF INCENTIVES

The employment of teaching and non-academic staff should be qualitative and adequate; ensuring that a round peg is placed in a round hole, for positive productivity. Staff should be paid as at when due, while incentives in areas of staff promotion, leave allowance, in service training and other fringe benefits should be very effective and sufficient.

INCREASE IN STUDENT'S ENROLMENT

Enrollment of students in science and technology education is low, compared to that of arts and social science. The Government should encourage student's enrollment, by incorporating bursary/scholarship award to students that major in science and technology education. Moreover, there are comparatively few available skill acquisition centers for graduates to be self-reliant; and the capital intensive nature of training students in the area of science and technology also hinders the enrolment of students in the programme. It is against this backdrop, that the Government and private firms should deem it, necessary to provide more skill acquisition centers in tertiary institutions in order to increase the rate of student's enrollment into science and technology education.

WELL EQUIPPED WORKSHOP/LABORATORY

Science and technology learning should be practical oriented. Workshops and laboratory should be adequately equipped for students practical and skill acquisition. It is better to have fewer well equipped workshops/laboratories where students will be perfected in both theory and practice; than having many that are ill-equipped for training students in their various areas of specialization. Standard imported equipments are preferable, but where it cannot be purchased, locally improvised equipment should be provided to avoid interruption in learning.

COMPUTER LITERACY AND E-EDUCATION

Students in science and technology education should be provided with computers for e-education. An e-education system is an integrated, simple to use, robust, with multi-lingual learning management and delivery system that is designed to enable rapid

development and management of education content via the internet, (Okundaye 2009). E-education system fosters communication between students, parents, teachers and administrators in science and technology education. The government and private companies should employ appropriate information and communication technology to help advance science and technology education and collaborative learning practices.

CONCLUSION AND RECOMMENDATION

The paper is of the view that the present status of science and technology education is not encouraging as evidenced by many science and technology education graduates who are unable to engage themselves in profitable activities for living. It is believed that science and technology education for sustainable technological development is a pre-condition for self-reliance, unfortunately, the programme has been dwindling. It is less successful due to neglect, poor funding inadequate workshop equipment, poor staffing and incentives, hence the need for enhancement of the programme to overrule these challenges in order to form solid foundation for the sustainable development of the nation.

However, for science and technology education programmes to assume its place of priority in terms of attention and administration for self-reliance and sustainability; the following suggestions should be solemnly embraced:

Adequate funds should be made available to science and technology institutions by the government and private individuals to enable it acquire and equip workshop/laboratories and libraries.

The fund could be generated through the establishment of a production unit or part time programmes, as a means of generating internal revenue for colleges and universities offering courses in science and technology.

Government should provide adequate computers and internet facilities to enhance teaching and learning, smooth administration of personnel; student's records; and other relevant instructional materials.

REFERENCES

- Abdulkadir, A. A (2011). The role of entrepreneurship education and empowering the Nigeria youth. *Business Education Journal* 5(1) 14-16
- Adeyemi, J. O (2007). Relevance of science education to technology. *Nigerian Journal of Science* 2(1) 9-10
- Aina, O (2008). Nigeria science and technology education in the near future. *JONATT* 1(2) 16-17
- Eyibe, S. C (2009). *Adult Education Essays in comparative Education*. Onitsha: Innosco Publishers Ltd.
- Federal Republic of Nigeria (2004). *National policy on education* Abuja: Government Press.
- Ibeneme O. T. (2013). Technical vocational education and training and youth empowerment for national security. *JONATT* 1 (2) 81.
- Nwokoye, S. K. (2011). The role of SIWES in realization of sustainable development in Nigeria. *JONATT* 1(2) 47-48
- Okafor E. G. (2011) industrializing the Nigerian Society through skill acquisition of Science and Technology Education. *International Research Journal of Resources and Development* 3(2) 38-39.
- Okondaye, B. O (2009) Delivery of Technical Education: The E-Education Alternative, *JONATT* 1(2) 52-53
- Oranu, R. M (2007) Vocational and Technical Education, and Man Power development in Nigeria. *JOTECH* 3(2) 30-32
- Osun, T. J (2009) Evolution of Science and Technology in Nigeria. *Journal of Science Education* 2(3) 16
- Oxford: Pregaman press
- Ruther field, J. (2009). *Science for America*. Oxford: Oxford University Press.
- Saha I. J (2006) *Education and National Development: A Comparative Perspective*.

UNICEF (2008). United Nations Children Educational Fund: Policy on educational planning and administration. Government's Gazette 2(2) 30-31