

FUNCTIONAL SCIENCE AND TECHNOLOGY EDUCATION TOOL FOR NATIONAL ECONOMIC EMPOWERMENT AND DEVELOPMENT

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Abstract

The national economic empowerment and development strategy (NEEDS) is rightly an ambitious reform programme aimed at meeting some of the basic needs in Nigeria. It is a programme meant to improve the standard of living of the masses. This paper tries to discuss: functional science and technology in attaining the goals of NEEDS in Nigeria, influence of science and technology on economic empowerment and development, promoting science and technology to achieve the goals of NEEDS. Recommendations were also made which if addressed will go a long way in keeping Nigeria in the realisation of the overall goals of NEEDS.

Introduction

The National Economic Empowerment and Development Strategy (NEEDS) is a constructed reform programme, which is aimed at touching all sectors of life of Nigerian. NEEDS is believed to be an answer to the challenges posed by development in Nigeria. It is seen as a homegrown reform programme, which is to be sustained beyond the projected year 2007. It is Nigeria's plan for prosperity, a plan to know what kind of Nigeria we want to build and live in and to create a New Nigerian citizen who values hard work and who realizes that one cannot have something for nothing. Accordingly, the working principles of NEEDS include among others job creation opportunities, generation of wealth for common human good, poverty reduction, employment generation and value orientation. Thus, its main objectives as an economic framework for Nigeria are to guide her to the level of becoming the largest and strongest African economy and a key player in the world economy (Ibrahim 2005).

The term Science and Technology have dominated conferences and symposia in this century than in any previous century. It is expected to continue to be the pivot on which any serious attempt at economic and social development in the future will revolve. In Nigeria the issue of national development has engaged the attention of many scholars in various fields. Science is the art or process of thinking out invention of practicable ideas, which seek to solve human problems. On the other hand, technology is the application of these (invention of sciences) in the actual solution of human problems (Ibrahim, 2005).

Science and Technology have become critical factors of economic and social development. Through the application of S & T the resources of nature have been transformed into goods and services for better quality of life. Thus, inspite of the tremendous growth of world population, the application of S & T to agriculture has sustained the population. The advances in S & T has assured man of comfortable living, improved his thinking process and very importantly conserved his energy for other activities.

The Nigerian society has been undergoing changes at an unprecedented rate. These changes occur in the political, economic and social life of the nation. Sometimes, these changes occur so rapidly that most Nigerians have found it difficult to keep pace. In the last ten years, Nigeria has witnessed the most traumatic changes especially in the economic and social life of the country. Individuals within the nation have found it difficult to survive the hardships that have come with these changes. The introduction of certain government policies into the polity has worsened the plight of the average Nigerian. Today, salaries can no longer sustain families for adequate feeding. (Asa and Kazeem 2006). The implication of this scenario is that the minimum wage for this country is no longer a living wage.

For Nigeria to develop into a self-reliant and economically viable country, it has to go through structural changes and psychological independence because psychological

independence is paramount to the struggle for nationhood and economic self-reliance. The leadership must set the pace for the masses to follow in its concerted efforts to reconstruct or rehabilitate and revamp the Nigerian economy for the survival of the present and future programme that will put every Nigerian hand on deck for self-reliance. S & T have a major role to play in this regard.

Functional Science and Technology in Attaining the Goals of NEEDS in Nigeria

NEEDS programme is a Nigeria's plan for prosperity which reflects the aspiration of Nigeria's Government and people. Four strategies were set to achieve this. It therefore requires a set of procedures for this laudable objective to be realised. This set of procedures could include educating and creating awareness in the citizens on what the programme has to offer for the improvement of human existence on the earth.

Science Education is defined as the cultivation and disciplining of the mind and other faculties of an individual to utilize science for improving his life, cope with an increasingly technological world, or pursue science academically and professionally, and for dealing responsibly with science-related social issues (Abubakar, Gero and Muhammad, 2006). The goals of Science and Technology Education can be stated under four broad relevant categories of personal needs, societal needs, academic preparation needs, and career awareness needs (Abubakar, Gero and Muhammad, 2006).

Goal of Science and Technology on Personal Needs

The aim is to prepare students to use scientific knowledge in improving their lives and for coping with an increasing developing technological world. The individual should be able to make rational decisions relative to science and technology and relate it to the society he belongs. He should have some knowledge of the ways in which science and technology affect his life.

Goal of Science and Technology

It is to prepare students to deal more responsibly with science-related societal social issues and needs. These are facts and skills a student needs to have in order to deal more effectively with environmental, energy, ecological, planning and resettlement issues which might affect the society in which he belongs.

It prepares the students who are likely to pursue science academically as well as professionally to acquire knowledge for such endeavors. There are necessary scientific ideas and processes, which form a part of the structure of science and are necessary for any further study of Science and Technology. (Students should be instilled with such ideas and processes).

It prepares the students to be aware and make sensible decisions about jobs related to science and relevant technology. Careers in science and technology increase as development progresses and as such, there is need to place more emphasis on topics and training on: Awareness of job opportunities such as scientists, engineers, technicians, equipment designers, computer programmers and operators, laboratory and medical assistants as well as jobs which apply scientific skills in agriculture (nutrition, medicine, sanitation, conservation, ecology etc.). Awareness that any person irrespective of sex, religion, tribe, educational ability and handicaps can get job in any scientific and technological fields: Awareness of the contributions a person can make in such jobs for the development of the society. Knowledge of the specific abilities, interest, attitudes and educational preparations associated with such jobs. View scientists as real and normal people. Clear understanding of how to adjust self and educational programmes to pursue careers in science and technology. Recognition of the interplay of Science, Mathematics and Language Arts (English, Arabic and Vernacular) as well as a broad based in social sciences in the development of scientific literacy.

Close examination of the meaning and goals of Science and Technology Education as stated above, indicated that it is geared towards the reorientation of values of the individuals and making them self-reliant, economically empowered and very useful to the society they live in. This eventually increases the per capital income leading to the economic empowerment of the government. It also makes Science and Technology Education as the basis for all meaningful developments. Abubakar, Gero and Muhammad, (2006) opined that Science and Technology Education is the mother of any meaningful development, and therefore for any country to succeed in its developmental plans, its science and technology education programmes must be good and relevant.

Influence of Science and Technology on Economic Empowerment and Development

Technology is popularly viewed as problem solving (Igwebuike and Ojogan, 1995). Over the years, man has used or employed different crafts in solving problems. For instance, primitive man's technological aptitudes include painting, modeling, fire making, tool making and so on. Somehow historians are puzzled how these crafts were developed to smelting of metals, making of glass, breeding of plants and animals, construction of sophisticated buildings and so on, at about 1750AD. These principles and theories of crafts became transformed into applied science. The scope of science had been to extend the frontiers of knowledge at man's disposal. In the 20th century, applied science started exerting more serious influence on technology. Technical inventions energised by scientific knowledge provide the necessary prescriptions and instrumentations for manufacturing purposes thus enhancing the economic rehabilitation and self-reliance of the citizens.

From what has been discussed so far about national development, three conclusions can be drawn. The first is that both are holistic and attitudinal. The second is that science and technology provide the intellectual and technical substratum for development. The third is that Nigeria is a developing country and the citizens need some forms of education in science and technology, which are not merely centered on the accumulation of corpus of knowledge in science and technology but intricately dovetailed with attitudinal and psychomotoric components. Let us briefly examine what has been done so far to provide this type of education in science and technology as stated in the National policy on Education (NPE, 2004). This policy has made a number of prescriptions about science and technological education. It states, "efforts must be made to inculcate an attitude of respect for an elementary technology will be introduced into the school curriculum as early as possible. It adds that science and technology will continue to be taught in an integrated manner in the schools to promote appreciation by students of the practical implications of basic ideas. Some of the objectives of education at the primary and secondary school levels have implications for science and technology education. The objectives at the primary school level are:

- a. the laying of a sound basis for scientific and reflective thinking, and
- b. providing basic tools for further educational advancement, including preparation for trades and crafts in the locality.

At the secondary school level, one of the objectives is "to equip students to live effectively in our modern age of science and technology". With these objectives in place in our primary and secondary school levels, the hope of promoting the economic development of Nigerians is assured and this will go a long way in making the citizens self-reliant since the policy states that the students will be equipped to live effectively in our modern age of science and technology.

Furthermore, the Federal government of Nigeria promulgated a National Policy on Science and Technology (NPST, 1986). This policy passes some judgment on the Policy on

Education by highlighting the fact that science and technology have had minimal impact on our total national effort in development. This means that the implementation of the stipulations in the policy on education with reference to science and technology has shown poor policy implementation. There is therefore the need, as Hassan (2005) states, not only to place greater emphasis on, but also to accord science and technology a pride of place in our implementation strategy if Nigeria is to succeed in:

- i. creating awareness leading to the development of science culture in the citizenry,
- ii. exploiting science and technology to transform the resources of nature into goods and services.
- iii. creating wealth and facilitating improvement in the quality of life.

If the foundation of science and technology education is properly laid in our primary and secondary schools, the knowledge will pave way for the proper rehabilitation of the economy thereby making every Nigerian a productive, element and once every hand is productive, Nigeria will be self-reliant in every sphere of life.

Promoting Science and Technology to Achieve the Goals of Needs

If Science and Technology is to succeed and contribute to empowering beneficiaries, the following factors need to be considered: acquisition of adequate practical skills; adequate study of entrepreneurship education; adequate use of career guidance services; enlightenment of the public on the importance of science and technology education and effective performance of Students Industrial Work Experience Scheme (SIWES).

Owing to the importance or usefulness of practical skills to graduates of science and technology education, there is the need for these science and Technology ensure that adequate practical skills are imparted to their students. To achieve this, the school authorities should make sure the tools and equipment for practical are available in the workshops and that teachers attend the practical lectures. Ibrahim (2005) says "the performance of graduates of science and technology in the "world of work" depends to a large extent on their level of acquisition of practical skills while in school. Hence it is imperative for students to be encouraged to acquire sufficient practical experience. When an individual acquires sufficient skills he or she would be capable of being self-reliant and invariably result in economic empowerment.

For Science and Technology to achieve its goals especially in the area of self-reliance and economic empowerment, there is the urgent need to adequately study entrepreneurship education in science and technology. This is so because it is one thing to acquire technical skills, it is another thing to acquire entrepreneurship skills that will help individuals to manage their businesses successfully. To buttress this assertion, Olaitan (1996) maintains that "entrepreneurship skills in form of small business management competencies should be incorporated in the programme of all science and technology". Based on the interest and gift of the students, the career guidance services would go a long way in helping students to make wise choices or decisions concerning the type of vocations they want to engage in life. A wise choice of vocation will lead to a successful business, which will in turn result in empowering the individual economically. To support this argument, Hassan (2005) is of the view that career planning and placement is the final phase of the guidance and counseling programme in schools. It is a systematic assistance given to pupils (students) in developing their goals and choices related to their educational and vocational interests. Career planning and placement are primarily conceived with obtaining information and opportunity and assisting pupils (students) to take steps to achieve their goals.

Since some members of the public do not know what science and technology entails, it is the duty of the government to enlighten the public on the importance of science and technology. Education is not meant for 'drop outs' but it is meant to equip beneficiaries with

skills that will make them self-reliant, empower them economically, reduce unemployment and invariably reduce poverty in the society. The public could be enlightened on science and technology education through the mass media like television and radio. The Industrial Training Fund (ITF), which is meant to cooperate with the technical oriented institutions in imparting practical knowledge to the students and to serve as a link between the institutions of learning and the "world of work" should endeavor to see that the training period is enough to make students function effectively. It should equally ensure that students are placed on jobs they offered at school all through the duration of their training and see that training facilities are available in all the organisations that accept industrial training students.

Conclusion

The behavior of an individual towards his neighbour or a nation towards another nation may be influenced by the economic, social and political strength possessed through science and technology education. It is worthwhile for a country to harness her human resources. Science and Technology Education therefore play a vital role in this respect. The various natural resource endowments of Nigeria, some of which have been identified and some of which are yet to be identified portend future greatness for the country. What is now needed is for an effective system of Science and Technology Education to be evolved so that manpower capable of exploiting the vast potentials of the land can be produced.

Recommendations

On the basis of the issues raised in this paper concerning the importance of Science and Technology Education generally, the following recommendations are hereby proffered not only towards the attainment of NEEDS but for the general Science and Technology development of the nation.

- The ways and means of funding Science and Technology Education should be clearly delineated. In fact, as it is the practice in some developed countries, legislation on the amount of money to be contributed by the Federal, State and Local Government towards the funding of science and Technology Education programmes could be examined. If such ideas qualify for an edict, it would protect science and technology programme from under-funding and ineffectiveness and hence effectively contribute to attainment of effective human capacity building in Nigeria.
- NEEDS programme should be directed seriously by the Federal Government so that every body will benefit from its dividends.
- More effective structures of Science and Technology Education curriculum directed at skill acquisition should be put in place.
- Orienting Science and Technology curricular of polytechnics and Colleges of Technology to be less theoretical and more practical-based.

References

- Abubakar, S.A, Gero, S.M. and Muhammad, S.A. (2006) The Contribution of Chemistry in Attaining National Economic Empowerment and Development Strategy (NEEDS) in Nigeria *Nigerian Journal of Technology Education* 1(1), 138-145.
- Asa, H. and Kazeem, M.G (2006) Factors Affecting Technical Education in Nigeria: *Nigerian Journal of Technology Education*. 1 (1) 76-85.
- Federal Republic of Nigeria (2004). *National Economic Empowerment and Development Strategy (NEEDS)*. A Publication of the National Planning Commission Abuja Nigeria.
- Federal Republic of Nigeria (2004) *National Policy on Education*. Abuja: NERDC Press.
- Federal Republic of Nigeria (1986) *National Policy on Science and Technology*, Lagos: Federal Ministry of Information.
- Hassan, A.M. (2005) *Science and Technology Education: Success and Failure*. Kano: Good Books Limited.

Journal of Science, Technology and Mathematics Education (JOSTMED)
Special Edition

- Ibrahim, A.O. (2005) Science and Technology Education for Economic Rehabilitation and Reliance. *Journal of Vocational Education Kontagora*. 5 (1) 187-192
- Igwebuike, T.B. and Ojogan, H. (1995) *Educational Technology and Micro Teaching Warri*: COEWA Publishers.
- Ikoku E.U (1980) *Self Reliance African's Survival*. Enugu: fourth Dimension Publishing Company Limited.
- Olaitan, O.S. (1996) Peculiar constraints of Functional Curriculum Development for science and Technology. Onitsha. Noble Graphic press.