

REPOSITIONING TECHNOLOGY EDUCATION IN NIGERIA

Mr. Omorodion J. Ikponmwosa

Abstract

Technology Education is that aspect of education, which deals with the acquisition of practical skills. The roles that can be played by such education in any developing country cannot be overemphasized. An honest assessment of our Technology Institutions in Nigeria would reveal that many of them are only what they are by name and not for the services they render to the community for survival and improved living standard. This paper examines the philosophy, goals and the development of technology education in Nigeria since independence; and drawing examples from some selected countries of the world, suggestions on the strategies to adopt in repositioning technology education in Nigeria. An attempt is made in this paper to identify gaps in the present structure of technology institutions in Nigeria and suggests possible solutions.

Introduction

Kolde, (1992) defined technology as the development and implementation of formats and formula as set out in blue prints, process charts, materials specification, and the operating instructions required for the manufacture of products and /or services plus the technical and managerial capabilities required to operate the facilities.

This is a very comprehensive definition of technology that will be adopted in this paper. Technology can therefore be defined as the know-how required to design, and construct products, to operate industrial manufacturing and processing facilities, and the management of the men, machines money and materials in the process of producing the final item. Technology is therefore, embodied products, processes and people. These definitions support the theory that there are many forms of technology. Any form of technology is however achieved only through applied research.

Education on the other hand can be defined as the aggregates of all the processes by which a child or young adult develop the abilities, attitudes and other forms of behaviour which are of positive values to the society in which he lives. That is to say that it is the process of transmitting culture in terms of continuity and growth for disseminating knowledge either to ensure social control or to guarantee national direction of the society or both (Fafunwa,1974).

It can be deduced from the definition that education is concerned with the transmission of knowledge and acquisition of skills that will enable the individual not only to survive in society but also contribute to the development of society. Having looked at the definitions of Technology and Education, the next issue to contend with is what is Technology Education.

The concept Technology Education has been defined in so many different ways and this has made it difficult to find an acceptable definition.

The Nigerian - National Policy on Education (2004) looks at Technological or Technology Education as that aspect of education that leads to the acquisition of practical and applied skills as well as basic scientific knowledge Gadzama, (1983) defines Technology Education as the study mastery/and utilization of manufacturing arts or systematic application of empirical knowledge to the production tasks in industry. Mathias, (1990) looks at it as the engineering disciplines that seek to find solutions to the societal seemingly insoluble socio-economic problems.

Gomwalk, (1992) views the concept as systematic study of techniques for making and doing. It is the means and activities by which man seeks to change or manipulate his environment to better his living conditions.

From the foregoing, Technology Education can be seen as that aspect of education designed to equip the individual for entry into occupations that are within the share of skilled crafts, engineering and scientific professions associated with the use and application of the basic principles of science and technology, apparatus, and machinery in the creation of goods and services and finding answers to societal problems for survival.

To promote technological development, there should be an effective interaction between incentives and opportunities for technical innovations and socio-cultural condition of the human

group within which they occur. Such conditions include: -

- a. Social needs for technology advancement must be ensured before the people and individuals could be convinced to commit their time, energy and resources into it.
- b. Social Resources, Technology development is only guaranteed where the material resources, capital (wealth) and the skilled personnel's are available and has the capability of organizing and directing the resources for effective utilization for Technology activities.
- c. The third required condition for Technological Development is the receptivity and willingness to appreciate, encourage and adopt new ideas or innovation by majority of the populace desiring improved living conditions. This was one of the major factors that motivated the Europeans and Europe in the 18th Century which gave birth to new ideas and inventors that culminated into the industrial revolution of the 19th Century, (Gomwalk, 1992).

The Philosophy of Technology Education

The survival of any country is a function of the education system. This assertion has been supported by Perkins (1977) who indicates that the system of Education provided by a nation or State is the determinant basis for its continuous survival. It is therefore very clear that the National Policy on Education (2004) is predicated on the integration of the individual into a sound and effective citizen and equal educational opportunities for all citizens of the nation. Both in the formal school system and the informal school system.

The principles guiding the provision of technology education in and outside the formal schools system is aimed at meeting the developing needs for technological advancement by providing competent specialists capable of exploiting the scientific and technological progress under local conditions, apply and adopt technology as the strategy for industrial development Bautzer, (1983). Similarly the need to equip the young Nigerians with saleable or employable, practical skills and knowledge for self-reliant as well as reduce the preference of the Nigerian populace for academic/grammar oriented curriculum which could impede the desire for socio-economic progress.

To this end, the aims of Technology Education as enunciated in the National Policy on Education are among others,

- i. To provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man.
- ii. To provide trained manpower in applied science, technology and commerce,
- iii. To enable our young men and women to have an intelligent understanding of the increasing complexity of technology.

Even a casual glance will reveal that these are laudable National ideals from the on-set of this discourse. It is necessary to have a quick look at the basic philosophies of education so that we can place technology education in its right perspective.

National Philosophy

The National Philosophy of Education has as its objectives:

- i. A free and democratic society
- ii. A just and egalitarian society
- iii. A united, strong and self-reliant nation
- iv. A great and dynamic economy
- v. A land of bright and full opportunities for all its citizens.

The policy sees education, among others, as the acquisition of appropriate skills, abilities, and competence's, both mental and physical, which equip the individual to live in, and contribute to the development of his society.

It is difficult, in theory to fault these principles as they have been put down. But what one observes in practice is that the country still has a lot of ground to cover in actualizing these ideas. Since Technology advancement hinges on technology education, any obstruction in the way has to be removed. Suggestions as to its removal are the essence of this paper.

Development of Technology Education in Nigeria

In pursuance of the objectives Of technological education in Nigeria, a number of strategies have been put in place by Government, among which are; -

- i. Establishment of appropriate science and technology agencies such as the Ministry of Science and Technology, the National Board for Technical Education (NBTE), the Centre for Adaptation of Technology, Awka, the Centre for Industrial Research and Development (CIRD), Project Development Agency (PRODA), and the Federal Institute of Industrial Research, Oshodi, etc Ibekwe, (1995) and Mohammed, (1990).
- ii. Establishment of Institutions .to train professional and sub-professionals in identified technological fields, such Institutions include the Universities of Technology and Agriculture, Polytechnic, Colleges of Education (Technical) and Technical Colleges etc. (Olaila, 1994) and
- iii. The establishment in 1971 of the Industrial Training Fund (ITF). It was establishment to promote and encourage the acquisition of skill in industry and commerce with a view to generate a pool of indigenou trained manpower sufficient to meet the need of the economy.

Model and Policies in Practice

A lot could be learnt from the development and the industrializing countries of Asia and the pacific such as China, Malaysia, Japan, India, Korea and other countries of Africa such as Tanzania and Botswana.

China

The Chinese Education System underwent revolutionary change during the communist revolution of 1949. Guided by the socialist ideology technological institutions were established for training in labour skills as the basis of cultivation in students, the correct attitude towards labour and the acquisition of relevant and functional labour skills. These skills include skills in industrial and agricultural production, as well as basic skills in doing work.

Technology education students' work in school - run factories or farms during training. While engaging in productive labour, students also made visits to people owned farms and factories.

In the school - run factories or farms where labour is provided by teachers and student, no income tax is paid to the state. Instead,' income is used to subsidize teachers and students general welfare. Other associated centers for training technology students include, laboratories, centre of material structure analysis, a computer centre and analysis, research and manufacturing, Yichang (1983). Most technology institutions also maintain close touch with outside factories or farms and used then as training grounds for students to do productive labour.

The advantage of the above system include among others, contribution to the Gross National Product (GNP) of the country through production and exportation of goods and services in the school - run factories and farms. It is also self-sustaining.

Japan

Japanese were greatly influenced by the Chinese civilization because they borrowed much ideas, technology, Art, style of government, language and religion from the Chinese people. In organization and operation, Japanese education system is similar to Nigerian 6-3-3-4 systems.

Most middle and high schools in Japan offer courses in technological education to prepare students for college or for practical skill jobs in the factories and industries (Word Book Encyclopedia Vol 11). The contribution of the institutions to the industrialization of Japan can be seen in some products such as electronic gadgets, wristwatches, transistors, calculators, and many other household products Adesina, (1987). Technology institutions in Japan like their counterparts in China generates income to sustain their technological programs as well as contributed to the economic growth of Japan through export promotions.

Tanzania

Tanzania is a good example in 'Africa in making the school system productive in the

technological areas of needs. Accordingly, education is directed at the rural areas where most of the people live and work. Education must therefore inculcate equity, responsibility for service based on ability whether in carpentry, animal husbandry, farming or academic pursuit.

Young people must be prepared to work in any Tanzanian rural area to improve their welfare. This type of education is equally expected to develop in pupils, socially- oriented and positive attitude to work and appreciation for rural livelihood.

Each school/institution in Tanzania has a farm where food items required by the community are produced and sold at subsidized rates or affordable prices to members of the community through co-operative shops where finished products such as eggs, vegetables, chicken, pork, craftworks etc are sold. Besides Agriculture, subjects such as Commerce, Home Economics and Mechanics are taught.

Vocational subject contents are taught using the interdisciplinary approach. This allows the teachers to relate theoretical concept with practice. School graduates are only certificated in the technology area based on the evidence of passing required self-reliant activities before graduating. Technology training in Tanzania encourages income generation to supplement the efforts of the state in the provision of general education, (Nyerere, 1997) What lessons for Nigeria?

Identified Constraints

- * Structural constraints.
- * The problems of textbook adaptation in technology education.
- * Resources personnel/instructor. -
 - * * Funding.

Structural Constraints

* Until very lately, our old system of education (6-5-4) produced a pyramidal structure with large percentage **of dropouts**. This system was elitist, and consequently inadequate. Worse still, each level of technology education was almost a terminus. Even with the introduction of the new (6-3-3-4) education system, there is only minimal improvement in the realm of streamlining secondary school education and the provision of advanced craft school. Gaps are still identifiable, and the working relationship among tertiary institutions is still not harmonious. The universities still sit on a pinnacle, and will prefer to have nothing to do with the others. The other institutions are also an assemblage of unrelated parts. Realignment is therefore necessary to fit them into a meaningful national educational network.

Proposals

* The blue-print on education (1978-1979) has very succinctly put it when it advocated that there should be the opportunity for a admission of artisans to craft courses, craft-men to technical courses and technicians to university or professional courses. No level of training should be a blind alley. This is the heart of the matter.

* An individual, for example, should be able to progress from vocational school through technical college and advanced craft school to polytechnics and higher degree, if he so chooses. The system should not be designed to prevent this -Also, an HND holder should have no difficulty in going straight for higher degrees just like his BSc holder counterpart.

Problem of Adaptation of Textbooks

* Each discipline has its own language and concepts that emphasize certain reading skills to achieve understanding of the material. The knowledge explosion and rapid development of technology have caused the constant creation of new technical terms. Some words or terms are unique to vocational and technical fields and others are hard to understand because they have special meaning in the occupation.

* A survey of the technological textbooks in the market today indicates that about 90% are written by foreign authors and it implies foreign contents.

Proposal

* Technology textbooks should be adapted to suit the environmental or locality in the area of

* content and language.

Resource Personnel / Instructors

* The purpose of Technology education programme is to prepare students adequately for successful entrance into and advancement with industry. The prime requisite for a successful programme is a qualified teacher who is occupationally competent and also competent in teaching methods and supporting skills, which are integral to the success of the instructional process.

Proposal

* "Competency - based Teacher Education" and Performance - Based Teacher" appear quite often in literature today. The terms are used synonymously. But the term 'Competency - Based" implies a minimum acceptable level of competency in performance.

Some of the advantages of competency- Based Teacher Education are; -

- a. The conventional method is time - based whereby people enter at certain time, and progress through the programme according to clock and calendar. Competency - based approach is based on performance rather than time.
- b. The traditional method focuses on an entire group of students. Competency ~ based allows for individuals to pace themselves through the programme.

Funding

Recent happening in the country .such as the population explosion, the increasing demand for admission, incessant strikes by teachers demanding for improved facilities and equipment, salaries and welfare packages have made government become over - burdened, considering the number of such institutions in Nigeria.

The situation is so bad that it is being speculated that even if fifty (50) percent of the 2005 Budget is committed to these needs, it would not be enough to solve the problems entirely. In the present circumstance, technology education stands to suffer most because of its unpopularity against the popularity of literary education and is more expensive in terms of equipment, facilities and staffing.

Proposal

Institutions should provide certain services to their community at affordable cost as a means of generating income. For example, Agricultural Services in the form of livestock production, extension services fisheries production.

Technology Education should provide consultancy services to individuals and cooperate organizations. Workshop should engage students to do jobs such as furniture making, electrical installations, and production of spare parts for automobiles, metal fabrication etc. Government should also patronize these institutions.

Recommendation

1. School - run farms and school - run factories should immediately commence and form the backbone of technology institution. It will impact skills, reduce government funding and increase the country gross domestic product.
2. The government and the Nigeria people as matter of necessity, must discourage dependence on foreign technologies and expertise for survival.
3. Our technological development efforts must be directed towards improving and developing our technology and not importing foreign technology.
4. The Curriculum provisions must be revised from time to time to meet the realities of time.
5. There is need for adequate interaction between research agencies and technological institution from time to time.
6. Craft men, technicians/engineers, and scientists must be recognized and assigned specific projects to design and execute from time to time as means of challenging them to greater heights.
7. More funds should be allocated to science and research institution than the present provision.

Conclusion

In the words of Professor Dabs' Fafunwa, he was right in saying "for too long, we have produced an army of clerks and pen - pushers and fewer technicians and artisans, engineers and the like that can in long run, change the face of Nigerian industrially and economically". And as John Gardner, the former president of Carnegie corporation said, "A Nation that scorns excellence *m* plumbing because it is a humble activity, and tolerates shoddiness in philosophy because it is an exalted activity, will neither have good plumbing nor good philosophy. And neither its pipes nor its theories will hold water".

We want Nigeria to advance. It is therefore necessary for her to encourage and sustain people's interest in technology education. All constraints and dead-ends must be removed.

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