

# CHAPTER 6

## Technology Education in Nigeria

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### Introduction

The origin of technology is traceable to man's early effort to make tools and weapons using stone implement. The skills and knowledge acquired were transmitted to succeeding generation who replaced stone implements (for cutting, scraping, boring, punching and hammering) to those of copper, bronze and iron (Roberts, 1971). Man continues to improve on the first device and on existing work methods by applying principles, theories and laws of science to solve human problems. So, technology is defined as the way of doing things through the application of knowledge derived from systematic investigations of natural force and materials. It leads to the development of processes and devices that enhance the quality of life (FRN, 1986).

From a historical perspective, it is generally agreed that what we call technology education started with programmes that emphasized industrial arts, vocational education, trade and industrial education or Industrial Technology (De Miranda & Folkestad, 1999; Roberts, 1971.) Introduction or exploration in technology education is gradually replacing the traditional industrial arts which prepares learners for jobs - based on manual or practical activities. This development is pragmatically and politically correct as well as appealing to the parents who associated vocational education with the activities of lower social classes. For example, specific trades such as automobile mechanic, welder, plumber and woodwork attracted a level of stigma. Technology education now demands higher level of skills. Besides, businesses and governments are increasingly investing in Technical Vocational Education and Training (TVET). The

purpose of Technical Vocational Education (TVE) is to equip individuals with skills, knowledge and attitude that will enable them to be economically productive.

This chapter presents the history, problems and perspectives of technology education in Nigeria. It projects into the future by highlighting the prevailing prospects and possibilities.

## **Historical Development of Technology Education in Nigeria**

Pre-colonial vocational education in Nigeria was operated through the guilds of blacksmiths, traders, builders and traditional physicians. There were no written curricula but the training was run on the apprenticeship system. The process of training is informal, learning experiences are not planned and skill development is characterized by observation and imitation (Olaitan, 1978). Western type of education came into Nigeria in 1842. The first set of missionaries educated their converts and their motto was "the Bible and the plough." They came to evangelise and at the same time provided vocational training to their converts. Mission Schools flourished during the missionary expedition in Nigeria and they introduced farming, brick making, carpentry and printing as part of the curriculum.

In 1876, the Roman Catholic Mission established an Agricultural school at Topo in Badagry. The Hope Waddel Training Institute was established in Calabar in 1895 by missionaries for vocational training where students learn carpentry, tailoring, smiting and brick making, among others. In 1909, Nasarawa school was opened in the northern part of Nigeria with technical courses in leather work, carpentry, smiting, weaving and book binding. The Phelps-Stokes Commission Report of 1922 titled "Education in Africa", found that the educational policies of the governments and the missions were inadequate and far from meeting the needs of Africans. The report saw the mission's educational programme as that of imparting information, developing the mind, and teaching three R's. Furthermore, the mission's educational package lacked organization, effective supervision and cooperation. The report recommended clearly defined objectives of education which included the acquisition of agricultural and industrial skills. It stated that: Industrial education is the response to the demand

that education shall be adapted to the daily activities of the masses, to the large commercial and industrial operations of the nineteenth and twentieth century and to the requirements of the notable development of science (Lewis, 1962:98). The report forced the British government to issue the 1925 memorandum on Education Policy in British Tropical Africa. This policy statement on Education made the Nigerian Government to open some trade training centres and technical institutions. By 1955, the modern schools in the then Western Region of Nigeria offered vocational courses in Needlework, Domestic Science, Handicraft, Music and Arts.

Notable milestones in the development of Technology Education between 1940 and 1960 are indicated below:

1. 10-year Technical Education Development Plan (TEDP) under the Colonial Development and Welfare Act of 1940. In 1944, the Government embarked on TEDP. Consequently, handicraft and trade centres were established for the training of craftsman while technical institutes were established for technicians.
2. Establishment of the Yaba Trade Centre (now Known as Federal Science and Technical College, Yaba) and the Yaba College of Technology in 1948.
3. Ashby Report of 1960 titled "Investment in Education" made strong recommendations for the development of business and technical education in Nigeria. The report stressed the need to have skill training in technical and commercial courses at Technical Institutes (Ashby, 1960). The Commission noted that there was over-emphasis on liberal education at the secondary and post-secondary level while vocational courses had poor image.

The recommendations of the Ashby Commission were aimed at two objectives:

- (i) To upgrade Nigerians who are already in employment but who need further education; and
- (ii) To design a system of post-secondary education that will produce the needed high-level manpower before 1970 and to design it in such a way as to provide expansion without being replanned in order to meet Nigeria's needs to 1980 (Ashby, 1960).

Onabamiro (1985) remarked that the adoption of the recommendations of Ashby report for the development of Technical Education in Nigeria led to the establishment of the following institutions:

- (i) The Northern Regional Government re-established 12 craft schools spread all over the region and three technical training schools at Ilorin, Wudil (near Kano) and Bukuru (near Jos).
- (ii) In the Eastern Region, 33 technical and vocational schools were established between 1960 and 1966.
- (iii) In the West, there were four Trade Centres for boys, a Women's Occupational Centre at Abeokuta and a Technical Institute (now The Polytechnic) at Ibadan.
- (iv) In the Midwest Region, Government opened a Trade Centre for boys at Sapele, a Handicraft Centre for girls at Warri; and a Technical Institute at Auchi. (Onabamiro, 1985:218). It is important to note that Onabamiro was a member of the Ashby Commission.

## **Development Planning and Technology Education**

National development plans influenced major development in Technology Education in Nigeria. During the First National Development Plan Period (1962-68), technical and trade schools were established and facilities for teaching the subjects were provided. Enrolment into Technical and Vocational schools was about 6,000 in 1962 but the number increased to about 12,000 in 1968 (Calloway & Musone, 1968). The National Technical Teacher Training College (NTTTC) was established in Lagos in 1968 by the Federal Government with the assistance of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The college which is now known as Federal College of Education (Technical) was established to train:

- (1) Technical Teachers for Technical Colleges, and
- (2) Technical Teachers for pre-vocational subjects in secondary schools.

Schools in this category offer a three-year programme in Technical and Business Studies. The three-year programme leads to the award of the Nigeria Certificate in Education (Technical). Also, they offer a one-year programme for the award of the

## Technical Teachers' Certificate (T.T.C.) in Technical, Business and Nursing Education.

During the Second National Development Plan Period (1970-74), efforts were made to improve upon vocational education in Nigeria. To this end, existing technical and trade schools were expanded and new ones were established. Within the plan period, the Federal and State Governments had a total allocation of £12.3 million for Technical education projects (FRN, 1970). The Third National Development Plan (1975-1980) was a follow up to the Second National Development Plan. The Government became aware that successful plan implementation did not depend on finance and other capital input alone but also on adequate trained manpower in different occupations. As a result, training for specific technical and business occupations was increased and incorporated in educational programmes in monotechnics, polytechnics and universities to meet the needed manpower. In 1976, a Federal College of Education (Technical) was established in Gombe. Colleges of the same status have been established in Asaba and Bichi. The College of Technology/Polytechnics increased from eight in 1973, to fifteen in 1978.

The Fourth National Development Plan (1981-85) implemented the provisions of the National Policy on Education. In 1982, the 6-3-3-4 system of education was put into operation. The new system involves a shift in emphasis towards pre-vocational and vocational training. The 6-3-3-4 structure replaced the 6-5-2-3 structure. The new structure consists of the six years of primary education, three years of junior secondary school, three years of senior secondary school and four years of university education. With a regular review of the policy in 1998 and 2004, full section was devoted to Science, Technical and Vocational education with special emphasis on Pre-Technical and Vocational Education as well as Technology education offered in Polytechnics, Monotechnics and Colleges of Education - Technical. The Fourth National Development Plan specified that the primary school curriculum be re-organised in line with the new system of education so as to make provision for courses like Agriculture, Home Economics and Health Education. It is worthwhile to note that enrolment in Technical Education programme increased during this period.

The Fifth National Development Plan Period consolidated and further developed Technology Education. By 1988, Federal Science and Technical Colleges were opened in Abuja, Ilesa,

Zuru, Jalingo, Kafanchan, Shiroro, Uyo and Okposi. These colleges are to provide courses in technology as well as local crafts peculiar to their environment. In 1988, the Federal Government established Federal Colleges of Education-Technical in Omoku, Umunze, Potiskum and Gusau. In 2000, the Federal Ministry of Education organized a national seminar on Technical and Vocational Education in Nigeria for the purpose of obtaining a Blueprint/Master Plan on Technical and Vocational Education in Nigeria.

Other policies and development agenda that were integrated into the national development plans which favour Technical and Vocational Education are as follows:

1. Human Capital Development in Education, Health and Skill Acquisition (UN, 2005); and
2. The Road Map for the Education Sector which recognizes Technical and Vocational Education as one of the priority areas (Rufai, 2010).

## **Current Perspectives on Technology Education in Nigeria**

An important issue that faces Technology Education is the perception of the people about the programme. Before now, Technical/Vocational Education (TVE) was associated with the activities of lower social class. The conservatives believe that TVE is a low level, non challenging education meant for students who cannot succeed in academic work. Others feel the programme is for the drop-outs from the school system, the physically challenged and disadvantaged individuals as well as for criminal/offenders who are serving in correctional institutions. Agbebi (1982) puts the stigmatization very succinctly in his remark by saying that the attitude of the public for a long time has been biased against technical education and aspersions cast upon it as "subject for grammar school drop-out". Generally, there has been a lot of misinformation and ignorance about Technical Vocational Education. That mentality is changing and there has been improvement in the perception of the people.

It is important at this point, to highlight the efforts made to change the perception. There was curriculum diversification that resulted in the shift from the traditional classical "Curriculum of grammar schools" towards the type of curriculum which is mindful of the vocational and technical imperatives of today's

education. This took cognizance of the fast pace of scientific, technological, political and social development and change in the world as well as the need to make education system in Nigeria relevant to national needs, aspirations and goals (Mkpa, 2009).

This action finally culminated in the formulation of the National Policy on Education (NPE) published in 1977 and revised in 1981. The Curriculum for training of craftsmen is now made of essential components such as general education, theory and related courses, workshop practice, Industrial Training/Production Work; Small business management and entrepreneurial running (FRN, 2004:3). Naming of Technical College is now changed to Science and Technical College. This connotes a combination of academic and vocational courses in the technical colleges.

Currently, National Business and Technical Examinations Board (NABTEB) certificates are being used not only for employment but for admission into tertiary institutions. Recipients of National Technical Certificate (NTC) and National Business Certificate (NBC) no longer feel inferior to holders of Senior Secondary Certificate (SSC). Besides, their parents appreciate the parity and value of technical education.

Similarly, the national policy on secondary education provides for both academic and pre-vocational education at the Junior Secondary (JS) level as well as academic and vocational education for the Senior Secondary (SS) level. The broad goal of secondary education in Nigeria is to prepare youths for useful living in the society; and for higher education (FRN, 2004:18).

In order to make the educational reforms practicable and functional, the Nigerian Educational Research and Development Council (NERDC) has developed the new 9 - year Basic Education Curriculum which covers 6 years of primary and 3 years of junior secondary education. The goals of Basic Education from the curricular perspective are to:

- (i) Provide the child with diverse basic knowledge and skill for entrepreneurship, wealth generation and educational advancement;
- (ii) Inculcate values and raise morally upright individual capable of independent thinking and who appreciate the dignity of labour;
- (iii) Provide opportunities for the child to develop manipulative skills that will enable the child to function effectively in the society and to realize his or her full potentials. (UBEC, 2008:21).

The Basic Education curriculum levels namely:

- (1) Primary 1 - 6); and
- (2) JS 1 - 3) contain core compulsory subjects which include: Basic Science and Technology, Computer studies/ICT as well as elective subjects like Agriculture and Home Economics and Business Studies.

Also, the NERDC has reformed and enhanced Senior Secondary Education (SSE) Curriculum by making it globally competitive for the content, context and products (Obioma, 2008). The primary purpose of these efforts is to use the curricula to produce youths that have vocational, technical and entrepreneurial skills and competencies. This will enable the school products to be well prepared for higher education as well as for the world of work.

Technology Education is the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (FRN, 2004:29).

It emphasized the application of modern information and communication technology (ICT) as well as traditional skills, entrepreneurship, and new generic competencies needed in both the formal and informal sectors of the economy. In keeping with the dynamics of social change and the demands on education, the National Policy on Education was revised in 2004 to incorporate innovations and changes that will improve technology education. For example, ICT has been introduced into the school system at the primary and secondary schools, technical colleges, monotechnics/polytechnics and universities. Also, the Government took actions to reposition science, technical and vocational education for optimum performance (FRN, 2004; FME, 2000). Figure 1 further explains the foregoing:

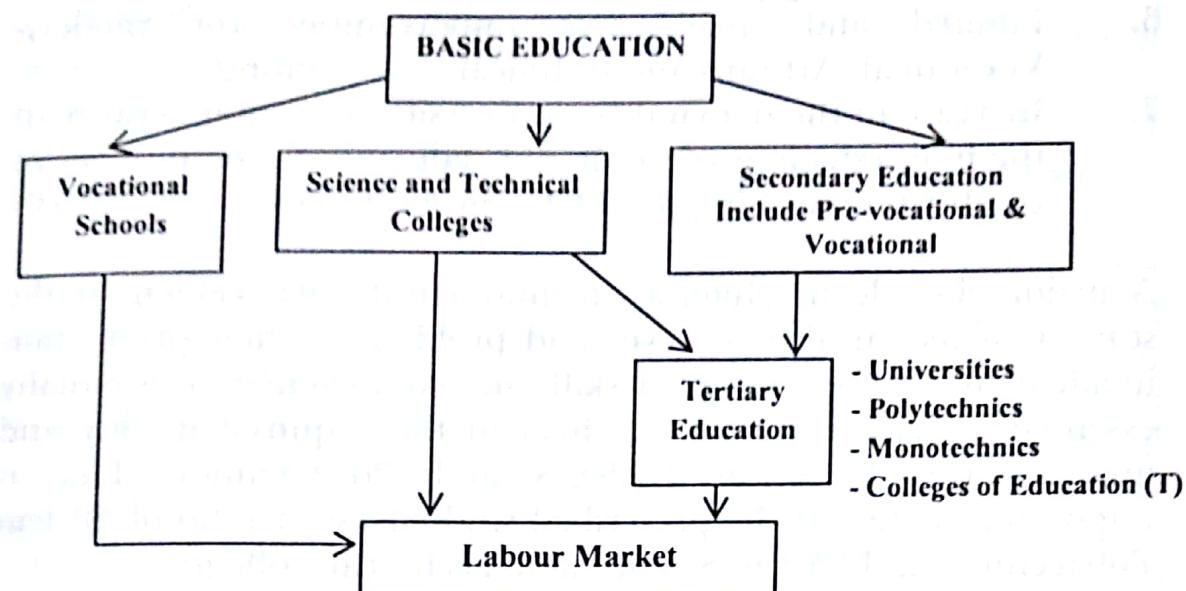


Figure 1: Existing Technical Vocational Education and Training (TVET) System in Nigeria

Source: Akinseinde, S.I. (2011) Policy and management best practices for optimal functioning of Technical Vocational Education and Training (TVET) institutions in Nigeria: Current Trends and Applications

The teaching of technology education at the primary school level is practical, exploratory and experimental while the secondary school level combines academic, pre-vocational and vocational subjects. Professional studies in technologies are available in Colleges of Education (Technical), Polytechnics and Monotechnics.

## Challenges of Technology Education in Nigeria

One of the challenges of education in the nation's education system is how to promote and strengthen Vocational Technical Education (VTE) in Nigeria. Yakubu (2000) and Akinseinde (2011) identified some of the challenges that adversely affect VTE in Nigeria as:

1. Inadequate human and material resources for effective delivery of the courses offered.
2. Employment opportunities for VTE graduates are limited due to insufficient industrial activities.
3. Making Vocational Technical Education job-demand driven in contemporary Nigeria.
4. Inadequate technical expertise to drive TVET system.

5. Inadequacy in the supply of tools and equipment required for the training programmes.
6. Limited and unattractive opportunities for modern Vocational, Artisans and technical training.
7. Increase in the demand for university education because of the high esteem given to it and reduction in the number of candidates enrolling for TVET programmes.

A major obstacle in Nigeria's technological advancement is the scarcity of technical manpower and problem of their production in adequate number, range of skills and competences. It is equally essential to have technical teachers in the required quality and quantity for Technical Colleges and Polytechnics. This is important in view of the prescribed students/staff ratio of 20:1 in Polytechnics and 25:1 in Science and Technical Colleges.

Also, technology education needs modern teaching/training facilities, equipment and tools. Facilities for teaching should be upgraded so as to mount modern vocational and technical training programmes.

The challenge of rising unemployment in the nation is increasing competition for existing jobs. The influx of young school graduates seeking employment in the labour market creates a dire need for new employment sources. This requires capital to create and maintain these sources. This analysis is intricately interwoven to an effective occupational training.

There is the need to provide Technical Vocational Education (TVE) in programmes that are needed in the labour market. The demand driven approach makes the TVE products competitive and responsive to demand. To achieve this, concerted efforts must be made to involve the private sector in training policy development and in the teaching of the required skills and knowledge (Akinseinde, 2010).

Efforts are being made to address the challenges of Technology education in Nigeria. As indicated earlier, some policy innovations and changes are introduced into the reviewed edition of the National Policy on Education.

The Longe Commission Report of 1992 is being implemented in the areas of funding, creation of self employment opportunities after graduation, and condition of service of academic staff, technicians and technologists (FRN, 1992).

The African Union (2007) observed that the African continent appears to have similar challenges in an attempt to

match training with employment needs. However, the question is whether or not unemployment is because of a lack of skills or lack of demand from the supply dimension. These cross-cutting issues need to be addressed to move Technology Education forward in Nigeria.

## **Prospects and Possibilities of Technology Education**

The apparent change in favour of functional education is as a result of the role science and technical education could play in planning for National progress and development. The National Policy on Education defined Technical and Vocational Education as a comprehensive term referring to: aspects of the educational process involving in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. (FRN, 2004:29)

The government stated the goals of technical and vocational education for the nation as follows:

- (a) To provide trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical levels;
- (b) To provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and
- (c) To give training and impart the necessary skills to individual who shall be self-reliant economically.

Technical and Vocational Education and Training (TVET) is geared towards functional education that will meet the needs of the Nigerian society. The programme emphasizes the application of traditional skills, entrepreneurship, modern information and communication technologies as well as generic competencies required in formal and informal sectors of the economy.

The economic success in Japan as well as in Asian countries like Taiwan, Hong Kong, South Korea and Singapore ought to be a role model for economic growth and marketing practice in Nigeria. These countries have highly educated and skilled workforce in specialized areas. Their government was committed to improving technology education. They adopted a model of

export -driven economies and relied on export markets to develop their economies (Barro, 1998), these countries have meaningful investment and commitment in science and technologies since 1950s.

The link between TVE, job creation and economic productivity is well documented (Iheme, 2002 & Bartram, 2000). TVE has a prominent role to play in training potential entrepreneurs and preparing graduates for employment and self reliance. The programme provides students with essential skills and knowledge. Besides, training content is selected for its relevance to specific and job clusters (Akinseinde, 2009). This is important to Nigerian youths because government jobs are no longer easily available. There is need to keep abreast with the current trends in TVET and invest more in the skill upgrading of our people through appropriate Technical and Vocational Education.

There is worldwide demand and need for Technology Education because of its intrinsic importance and its skills development, especially its distinctive goal of preparing people for the world of work. The skills development is for employment, growth and for poverty reduction. While individuals need practical skills for the world of work, the term skills cover:

- (1) Hard or technical skills,
- (2) Soft skills such as safety skills, communication skills, leadership and business skills; and
- (3) Attitudinal or behavioural skills.

Technology education can help to alleviate poverty in Nigeria through the acquisition of employable skills. These skills are found usable in Agriculture industry especially as this sector of the Nigerian economy has been neglected over the years and now considered as the engine room for economic growth (Sobowale, 2011). Nevertheless, the approach to skills development cannot ignore the effects or challenges of globalization. For global economic competitiveness, Nigeria needs to improve the capacity of her workforce in areas where they have competitive advantage. This will enable the workforce to respond to national development needs and to the demand of a rapidly changing globally competitive world (Floulu, 2011). The high rate of unemployment with its accompanying social problems in Nigeria can reduce where there is effective TVET policy and implementation.

## Conclusion

Technology Education in Nigeria is changing as a result of modern programmes that teach people to be useful to themselves as wage earners, entrepreneurs and of value to the nation's economy. More people are beginning to understand the nature and comprehensiveness of vocational programmes. What is required now is to train students in areas where there are jobs. As technology creates new jobs, programmes that teach obsolete skills must be expunged from the curriculum and new ones introduced. Skill is power and the government needs to implement Technology education programme effectively in order to prevent marginalization and oppression from economically advanced countries. Globalization is hurting poor people and poor countries alike as a result of their poor macroeconomic policies (e.g. large fiscal deficits) which discourage investors.

Technology education is essential to development because it is linked to training, job creation and employment. What all stakeholders need is to work together and apply the best practices to the functioning of technology education institutions in Nigeria.

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