

The Neglect of Vocational and Technical Education: a Set Back to Technological Advancement in Nigeria. A Review

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Abstract

This paper is on the neglect of vocational and technical education and its setback to technological advancement in Nigeria. It attempts to throw light into the concept of science, vocational and technical education. It stresses the prospects of technology in courses such as agriculture, business education, home economics, fine and applied arts and others. The paper also stressed how the influence of vocational and technical education can lead to technological development which in turn will result in economic growth. Causes of setback to technical and vocational advancement and its implication were X-rayed. Challenges that face vocational and technical education in Nigeria such as investment in human capital, low per capita income, students enrolment, attitude of the nation, limited supply of vocational and technical staff, government policy etc. were analyzed. The study proffered the following recommendations to mitigate the challenges as follows: There must be intensive funding of all aspects that have to do with acquisition and sustenance of technology, government should lay more emphasis on local training of technical and vocational teachers, and along-term plan for the develop of a set of technologies that are specific to the nation's needs and circumstances is necessary.

Keywords : *Neglect, Vocational Education, Technological Advancement, Nigeria*

Background to the Study

The desire for technical and vocational education is unavoidable in the plans of both developed and developing nations. Vocational and Technical education has been an integral part of national development strategies in many societies because of its impact on productivity and economic development. Despite its contributions the leaders of Nigeria have not given this aspect of education the attention it deserves. And that is one of the reasons for the nation's underdevelopment. (Dike,2005). According to Momoh (1999);Tolubanwo (2011), a sound knowledge of science and technology is a prerequisite for human living. In some Third World countries where technology is still evolving, the education received by citizens is not enhancing productivity. Such economies have a low industrial capacity utilization, poor infrastructural facilities such as light, water Supply, motorable roads and telecommunications. If Nigeria would be great, Technical and Vocational Education have to be accorded special attention. We have to acquire or evolve and nurture technologies that will take us to the expected heights. The existence of the National Board for Technical Education (NBTE), Federal Ministry of Science and Technology in addition to other Technical Colleges, Polytechnics, Colleges of Education and Research Stations in different geo-political zones of our nation is an indication of the country's intention to give technology it's rightful priority. There is an attempt to impart special skills for modern production methods. This will go a long way in increasing economic progress and improve standard of living (Samuelson and Northaus,1989; Okafor, 2011). Despite these structures at both Federal and State levels, we should agree that the expected technology that we are clamouring for is not meeting the needs of the very people that are aware of its global existence. For instance, many industries are closed down due to lack of a technical and skilled workforce and or other industrial needs, other industries operate at low capacity due to inadequate infrastructures in the country.

In this review paper, the specific objectives to be addressed were to:

1. Define the concept of what of Science, technology, vocational and technical education
2. Assess the prospects of technology in Nigerian schools and the economy
3. Analyze factors that results in setback to technical and vocational education in Nigeria
4. Examine the challenges currently facing vocational and technical education in Nigeria.
5. Suggest the way forward

The Concepts of Science, Technology, Vocational and Technical Education

According to Ogunlade (1992) Science was derived from the Latin word “scientia” meaning “to know” and is a term used in its broadest sense to denote systematized knowledge in any field, but applied usually to the organization of objectively verifiable facts. Umezurike (1997; Okafor,2011) simply defined science as knowledge that can be tested by experiment. Technology on the other hand was derived from the Greek word “techne” meaning 'art' or 'craft'; it refers to ways of doing things. Sambo (2002) defined technology as the production of goods and services while Daniyan (2000) sees it as the state of knowledge or the study of new scientific, industrial skills and their utility. Vocational Education is defined by Towe (2000);Cletus and Ibanichuku (2012) as that manpower which has received post –secondary technical education and training, has supervisory skill and can perform as an intermediary between the full professional and lower level workers such as craftsmen and operatives depending on the field of activity. For the purpose of clarity, vocational education is that skill-based programme designed for sub-professional level education and based on a specific vocation. Technical education, on the hand, facilitates the acquisition of practical and applied skills as well as basic scientific knowledge. The major difference between the two terms is that, whereas vocational education is designed for a particular vocation, technical education does not target any particular but gives general technical knowledge. Thus, while every vocational education programme is technical in nature, not all technical education programmes are vocational.

The technology, which we are looking for via the Vocational and Technical Education, should have the following characteristics –

1. Use of local materials for production-
2. Create jobs
3. Employment of local skills and labour
4. Be affordable by local groups of people

Therefore appropriate technology for any country is the technology that is culturally acceptable, gives direct or indirect employment to optimum number of people; increase productivity and results in minimum damage to the environment.

Technical Education

Technical education, as entrenched in the Nigerian National Policy on Education, is concerned with qualitative technological human resources development directed towards a national pool of skilled and self-reliant craft men, technicians and technologists in technical and vocational field (Okafor,2011).The relevant subjects for technical Education are Mathematics, Technical Drawing, Physics, General Science, Civil, Mechanical and Electrical trades, Wood Work, Applied Electricity, Metal work, Electronics and Auto mechanics. The study of Technical subjects in schools provides one with up to date information on new technologies and new methods and tools are constantly applied in various occupations, We produce technicians to repairs broken down equipment in the home, industry and office. They also repair the telephones, the lift, the air conditioners, radios, television sets, computers, tractors, the Generators, Videos. Freezers etc. A predominantly illiterate society or predominantly less educated society cannot expect to achieve any significantly political, economic, socio-cultural and technological development (Abubakar, 2000). A country's ability to effect and sustain technological change will depend on the scientific capabilities of her people, the quality and size of her education and training system, and the percentage of her income which she devotes to basic Research and Development (R&D) (Cletus and Ibanichuka, 2012). Presently Nigeria is offering education in general subjects, but to achieve development, it must offer a variety of courses for disciplines such as technical, vocational, professional, agricultural, and so on, because the country needs a balanced distribution of manpower for all profession so that the vast population of Nigeria can contribute to economical growth by participating in different professions.

Technical Education and its Setback on Technical Advancement

According to the Oxford Advanced Learners Dictionary, Neglect has to do with 'not giving enough care or leaving undone a certain task'. It is true that despite all effort and available structure already established that Technical Education has not been given due attention. This constitutes a set back to the advancement of Technology in Nigeria. Every facet of the economy has been affected by lack of skilled technicians. The financial sector lacks technicians to regulate the banks and to develop financial software to properly tackle the rising fraudulent activities in the sector. The neglect of technical education is socially and economically injurious because it is robbing the nation the contributions the graduates would make on national development. Although technical and vocational educational seem deficient in citizenship or leadership training (Friedman,1982), it provides students with 'life skills' (Alwasilah,2002) to become productive entrepreneurs as it engenders creative and innovative ideas, enlarge the economic pie and increase personal freedom. The neglect of technical education is an obstacle to national development. It cannot be

overemphasized that technical education is the engine for economic growth, it is the missing link in Nigeria's development policy (Dike, 2005) as poor training and ineffective institutions in Nigeria suffers from low productivity. This sub-topic will be considered under the following.

Prospects of Vocational and Technical Education in Nigerian Schools and the Economy

Since Vocational and Technical Education deals with the acquisition and utilization and skills and new methods of production, the graduation of a fully equipped crop of students who are slowly being injected into the productive system forms the basis of exported technological advancement. The establishment of National Business and Technical Education Board and a resultant coherent national policy for technical education and vocational training is expected to be a key driver of Nigeria's economic growth (Okafor,2011). There is an established positive linkage between economic growth and investment in human capital. This application will be discussed under the following sub – headings:

Agricultural Science Education

In an attempt to impart agricultural skills to the Nigerian youth, Agricultural Education is being offered by many Colleges of Education and the curriculum calls for attainment of certain practical components before graduation. At the point of graduation, these categories of students are considered to be qualified Agricultural Science teachers, ready for public or private sector employment. Under favourable conditions of operations they could set up their own farms and thereby contribute to economic growth through improved ways of food production. For years, scientific and technological advancements have benefitted farmers in the industrialized world by driving agriculture production. However, smallholder farmers who are responsible for 80 percent of the food in the developing world have yet to see similar gains (Food and Agricultural Organization (FAO,2011). These farmers, the majority of whom are women, lack access to many of the tools needed to be successful, such as modern irrigation practices, crop management products, fertilizers, postharvest loss solutions, improved seeds, mobile technology, as well as access to information and extension services. Despite these challenges, agricultural technology has played a central role in overcoming food security challenges in the past. The 20th Century marked a time of significant public investments in scientific research that contributed to historical increases in food production (International Food Policy Research Institute (IFPRI,2002). Meeting global food needs will demand another era of innovative science-based solutions, but one that addresses vastly more complex

issues and improves upon the Green Revolution, including environmental and ecological considerations, nutrient deficiencies, and food wastage(IFPRI,2002). Science-based agricultural tools hold great promise for tackling the world's growing population and food demands in the following areas:

Plant Breeding

Plant breeding, the science of optimizing a plant's genetic makeup to produce desired characteristics, can be accomplished through a number of techniques, including hybridization and more complex molecular technique resulting in higher yielding crops that are better in quality tolerant to environmental pressures resistant to pests and diseases etc.

Hybridization

Hybridization is a tool that farmers have used to develop high-yielding seeds the early 1900s(USDA)Hybridization involves crossing two or more crop lines to produce hybrid crops with more favorable traits, from combining genes from the selected parents.

Agricultural Biotechnology

Plant breeders use agricultural biotechnology as another source of genetic variation to produce superior crops with improved yields, while requiring fewer inputs. The products of this technology have been widely used by farmers for over a decade in varieties of corn, cotton and soybean. This method has been used to enable crops to tolerate insects viral diseases, certain herbicides, produce grain with improved nutritional quality, and resist stresses caused by extreme weather.

Dams and Irrigation

In Nigeria, there has been an upsurge in dam construction in the past three decades. Ofoezie(2002) identified a total of 323 dams out of which 246(76.2%) were constructed between 1970 and 1995. He also reported that out of the 323 dams in Nigeria, 106 were large dams(dams with higher than 15m or 10-15m high with a crest length of over 500m or having a reservoir capacity of 1million metric cube, 27 were medium sized dams(with walls of 8-10m high); 192 were small dams wall with less than 8m)

Ten percent of cropland is irrigated using water stored behind dams. Irrigation system in modern agriculture, however, depend on damming major streams to store and control the flow and allow delivery in the desired amount whenever it's needed, Example of modern irrigation, border on drip irrigation; corrugation and sprinkler irrigation(Schwab et al., 1992), In an attempt to locate irrigation as an appropriate technology in Nigeria, it is wise to clearly define appropriate technology, which is define as the systematic application of collective human rationality to the solution of problems through assertion of control of over nature and all kind of human processes(Tolubanwu,2011). In this regard, agricultural technology may be viewed as application of specific technology for the promotion and development of agriculture (Sumit, 1990). In this context, there should be proper design, construction and maintenance of dams all over Nigeria and the world in general (Tolubanwo, 2011). This will enable agriculture to be all year round which will result to availability of food.

Other Technologies

Besides improved seeds and crop protection tools, other technologies enable farmers to increase their productivity, such as modern irrigation practices, mobile technology, fertilizer and mechanization, for example, over the years, irrigated land has proven to be twice as productive as rain fed farmland. Similarly, mobile technology can enable farmers to increase their yields by connecting them through text messages and help lines to agricultural market information, best practices and extension services designed to meet their localized needs. Fertilizers have also contributed to doubling and tripling crop yields, supplying crops with the essential nutrients missing from soil, as well as facilitating the more efficient use of land and water.

Business Education

The relevant subjects for Business Education are Accounts, Commerce, Economics, Shorthand, Typewriting and Business Methods. Youth in this category of Vocational Educational are taught as teachers in training, the techniques of accounting and it's practice, Shorthand, Typewriting, Computer Appreciation and Application (e.g. Information Technology) On graduation they are consumed by the economy either as teachers, accountants, secretaries etc. They are risk bearers even as co-coordinators of factors of production in an effort to create goods and services to consumers. Without this category business in big companies and industries will stand still and runs the economy to a halt.

Home Economic Education

These are the homemakers; they are concerned about welfare of the home as the blocks that make up the nation's population. In home-economics education, the students acquire the technique of management, interior decoration, budgeting, hygiene, food and nutrition etc. their role in the Nation is unique, and they graduate to serve as teachers, administrators and nutritionists. They are ready for self-reliance. They form the basis for technology advancement in food and nutrition industry.

Malnutrition in Nigeria

The National Population Commission (NPC, 2012) put the Nigerian population as (150,000,000) one hundred and fifty million. The technological advancement in Food and Agriculture are trying to make it possible to improve the health and wellbeing of millions of Nigerians. But malnutrition impact roughly on the teaming population of Nigerians approximately one in seven people go to bed hungry world-wide (UN, 2012) and malnutrition is linked to the deaths of one out of every three children under the age of five in developing world (FAO, 2011).

A survey conducted by civil society scaling up nutrition in Nigeria (SC-SUNN) reported that Kaduna has the highest malnourished children followed by Nassarawa and Niger States respectively (Victor, 2015).

Severe Acute Malnutrition (SAM) prevalence among children from zero to 59 months of age is 8.7 percent nationally, but 27.6 percent, 3.5 percent and 8.0 percent for Kaduna, Nassarawa and Niger State respectively is high (CS-SUNN, 2015). The Nigeria Demographic and Health Surveys (NDHS) also reported that the rate at which malnutrition has declined is 41 percent in 2008 to 37 percent in 2013. Within five years we were able to reduce malnutrition by four percent which is abysmal. Nigerians must rise up to see that nutritional status of our children and mothers is improved. The North in general has malnutrition problem compared to other part of the country. This is due to the neglect of vocational education and overdependence on government by the people of the sub-region in general (NDHS).

Fine and Applied Arts

This category of vocational workers are involved in printing works, sign writing, graphic design and aesthetic application in the economy. Thus, technical subjects play an important role in achieving the goals by providing the technical manpower

that adopt science and technology for better condition of living. It is believed that the feat already achieved by the industrialized nations in ceramics can equally be achieved in Nigeria (Sullyman (2007)).

Challenges to Realizing Vocational and Technical Education in Nigeria

Investment in Human Capital

The scientific and technological advancement that has been achieved in industrial Nation such as Japan, United State of America and Western Europe was possible by heavy investment in effective education suitable in those countries.

Low Per Capita Income

Nigeria is a leading African Country in terms of regional security, Economic empowerment and strategic planning is least in terms of real annual Average per capita Educational Expenditure. Given the economic potential of Nigeria, more should have been spent as per capita. It is very possible that Nigeria had more unemployed labour force which remain redundant. This invariable will adversely affect per capita income as it is a function of productive economic activities.

Students Enrolment

Admission policy into the polytechnics by National Board for Technical Education stipulates that Ration of 7:3 be maintained for science, Technology against humanities or social sciences. In the past the admission was without focus with very few being admitted into Science and Technology. The present policy guideline, if implemented, will facilitate the Journey towards achieving Technological breakthrough and mastery. For the Production of Nigeria graduate that will acquire skills and new methods of production, the new admission guideline for the polytechnic and related institutions has to be followed. One- of the features associated with technological advancement is a spirit of scientific enquiry closely related to the process of production (Rodney, 1972). Until; our institutions train the potential labour *force* this condition will not easily be achieved. The enrolment of students in our Universities and others higher institutions into science and technology is still averagely below the 70%/30% ratio and could always affect development adversely (Abubakar,2000).

Attitude of the Nation

The heights which industrial countries, like Japan, U.S.A, Canada etc. have depended on their attitude towards technology. e.g Malaysia came to Nigeria to study the technology of oil palm production. Today Malaysia is a major exporter of palm oil while that of Nigeria had dwindled to the extent that we find it hard to produce *for* internal consumption. Though Nigeria is blessed with mineral resources (crude petroleum, solid minerals and liquefied natural gas etc) We are yet to see the fruit of our technological struggle. Much is yet to be invested in the field of technological acquisition and every body in the country should help in creating the awareness and commitment towards achieving the better tomorrow through technology. Even with the oil we have, we are only good in importation of consumable goods and services but the acquisition of technology will give us the desired power to produce and export for better earnings. It is sad to say that with the discovery of oil, the Nigeria attitude has changed from being hard working citizens to lazy people only ready to manage an import oriented economy.

Limited Supply of Technical and Vocational Staff

Inadequate supply of technical and vocational teachers is one of the basic factors militating against the efficient implementation of the Technical Education aspect of the National Policy on Education. It gives priority to vocational and technical courses as basic to technological advancement. The teachers do not have enough motivation to put in their best. Therefore, even those who read vocational and technical Education would prefer being in other sectors of the economy rather than taking to teaching profession.

Government Policy

The aspect of vocation and Technical Education and its bearing on technology is national issue. Good government policy towards technological take up via vocational and Technical Education is a necessary condition; intensive funding and national commitment will start and sustain Technology for better productivity and economic growth. Government policy that pays only lip services to science, Technical will surely delay the expected technological break through as in the case of Nigeria

Workshop Equipment and Handling

Set back to technical and vocational education in Nigeria is the existence of inadequately equipped workshops and laboratories. In the case of which the equipment is available, there are always lacks of required and qualified staff to

handle them. Most *cases* there report of theft, vandalization and burning of equipment due to the nonchalant attitude of the host community.

Conclusion and Policy Recommendations

There are enough structures on the ground to prove that Nigeria is yearning for technological breakthrough. There are also facts that indicate the negligence of the expected technology through lack of proper national funding and commitment that will give rise to technology. This paper is making the following recommendations as to the way forward.

1. Before we will experience the birth of new technology in the Nigeria economy there must be intensive funding of all aspects that have to do with acquisition and sustenance of science and technology. This is the price paid by developed and developing nations interested in science and technology as a weapon of wealth creation.
2. Students in this great country are advised to take advantage of the available opportunities for such training, considering the fact that these are the areas that are more favoured in terms of admission and job creation in the country today
3. Government and schools should evaluate the success of local training of technical and vocational teachers. Teachers also need motivations in every way so as to prevent their drift to non-teaching profession.
4. Government should work hard toward addressing the setback to technological development in the country. It is quite clear that no country can develop by ignoring its indigenous technology. Therefore, the curriculum in the primary, secondary school and tertiary institutions should be modified to include aspects of indigenous technology covering research development, dissemination and teaching.
5. A long-term plan for the development of a set of technologies that are specific to the nation's needs and circumstances is necessary. This will certainly not be an easy task, as it will require a combination of research, financial commitment, and training and, above all, political will.

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