

Provision of Adequate Laboratory Tools and Equipment: The Need for Skills Acquisition by Graduates of Technical and Vocational Education

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Abstract

Vocational and Technical Education (VTE) is an aspect of Education which include any or all aspects of Vocational Education, is an aspect of Education that prepares the learners to earn a living in a recognized occupation or be self-employed. These skills can only be acquired through a well-structured programme and functional laboratories/workshops with adequate modern tools, machines and equipment. Provision of adequate laboratory tools and equipment that serves as a pivot on which VTE graduate stands to be gainfully employed was fully discussed. This paper highlights the concept and roles of VTE. Laboratory/Workshop tools, machines and equipment as they affect the implementation of VTE in Nigeria were also discussed. Conclusions were sieved from the issue raised in the study and recommendations made are: More government commitment is required in implementing Vocational Technical Education. Government should encourage the programme by supplying vocational and technical institutions with adequate funds, tools, equipment and necessary infrastructure at various levels. Example is Tertiary Institution Trust Fund (TETFund) which is currently the back-bone of higher Education in Nigeria and reasonable percentage of annual tax generated by government should be used for the procurement of modern laboratory facilities.

Keywords: Vocational Technical Education, Laboratory tools and equipment, self-employed, gainfully employed, Concept and roles of VTE.

1. Introduction

Technical and Vocational Education is designed mainly for the training of individuals to be professional workforce and semi-professionals (Craftmen and Technicians) in various fields of Technology and Engineering trades. Graduates of these trades are suitably qualified for any positions that requires the use of tools and equipment.

For the fast growing of any nation, the services of a well trained personnel are required for the repair and maintenance of machines and equipment (Ndomi, 2005). Despite the overwhelming recognition of the roles of VTE in Nigeria, the programme has been regarded as an inferior type of Education. Dike, 2005 stated that despite the contributions of VTE, Nigerian leaders have not given this aspect of education the attention it deserves. Unfortunately, youths were unable to accept these important areas of human endeavour where beneficiaries can be gainfully employed or self-reliance.

Vocational and Technical Education curriculum must be structured to meet the purpose it was designed for through standard laboratory with modern tools and equipment. These will enhance the training of all the recipients for the world of work. According to Finch & Crunkilton (1999) the major goal of TVE is to prepare students for successful employment in the labour market. Students 'involvement in practical projects are highly relevant in VTE Curriculum with standard laboratories/workshop. The future of VTE will be bleak without standard laboratories/workshop where students are to be trained with modern tools/equipment.

Laboratories/workshops with adequate tools/equipment are the engine room of VTE where students are practically trained to acquire skills in different fields to manage the nation's economy for sustainable development. A successful implementation of VTE rest on standard laboratory/workshop with adequate tools/equipment. Most Institutions in Nigeria are running VTE with obsolete tools and equipment therefore there is the need for the provision of suitable environment with adequate tools and equipment for VTE in Nigeria.

Itedjere (2005) stated that one of the primary aims of the new national policy of education that was called 6-3-3-4 system now 9-3-4 that was designed by the Federal Government in 1981 was to equip every Nigerian child with basic skills that will enhance them the purpose of technological

development and advancement in Nigeria. This assertion can only be achieved through well - equipped standard laboratories with modern tools and equipment.

2. The concept of Vocational and Technical Education

Vocational education has been described in various ways as it appears to different individuals with reference to its aims, objectives and purpose. Vocational education is that type of education that prevents economic, political and social crises that are threaten the stability of some nations in various forms. Vocational education provide employment opportunities and higher job mobility while Technical education according to the National Policy on Education (FRN 1981) is that aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge.

Vocational and Technical Education VTE according to UNESCO 2002 are those aspect of educational process involving in addition to general education the study of technologies and related sciences and the acquisition of practical skills, attitude, understanding and knowledge relating to occupation in various sectors of economic life. In spite of the skills people acquire from VTE, they have broad knowledge, skills and attitude that now recognized as indispensable for meaningful participation in work and life. Some of the benefits accrue to VTE are self-awareness and self-esteem, interpersonal citizenship, communication and entrepreneurial skills. Vocational and Technical Education is the skill training and retraining programme which is given in school or in classes, where a systematic learning experience is designed for an individual to acquire skills for gainful employment in a recognised occupation or cluster of occupation as a technical personnel under public supervision and control (Omofonmwan, 2014).

The above definition was strengthened in the emphasis of the National Policy on Education (1977), revised in 1981, 2004, 2010 and 2013 respectively which specified the goals of vocational and Technical Education as follows:

- a. Provide the nation with trained manpower in the applied sciences, technology and business
- b. Provide technical knowledge and vocational skills necessary for agriculture, commercial and economic development.
- c. Give training and impart necessary skills to individuals who shall be self-reliant economically.
- d. Increase the career options available to individuals.

The above goals were structure in the service areas of Vocational and Technical Education. These include Agriculture, Business, Home Economics, Industrial Technical and recently Computer Education. The service areas of Vocational and Technical Education were carefully harnessed to deal with all facts of life and its experiences.

3. The roles of Technical and Vocational Education

There is no gain saying the fact that the role of Technical and Vocational Education is crucial and supportive in the nation's quest for economic diversification and sustainable development. The development of human capital having the appropriate skills, right attitude and good knowledge of how to retrieve process and utilize national resources come within the purview of Vocational, Technical Education and training for national development. If the Artisans, Technicians and Technologists are adequately trained, they will fit well in small scale enterprises, industries, Colleges and Universities. There will be less dependence on foreign technical personnel in our cottage and main industries. Indigenous technology will be encouraged and there will be adequate work force to handle our road maintenance, building, plumbing work, electrification, mechanical works, agriculture and computer, thereby increasing import duties, all of which will also lead to economic diversification and sustainable development.

In Nigeria, the technical and vocational training institutions recognised by the National Policy on Education outside the University system are Vocational schools, Technical Colleges, Colleges of Education (Technical) and the Polytechnics, all of which are training institutions meant for the production of graduates who shall be self-reliant and contribute their quota to national development through instrument of Vocational Technical Education. However, vocational technical education and training in Nigeria "should emphasise entrepreneurship awareness for it to be relevant in achieving

the nation educational aim of inculcating the right type of values and attitudes for survival of an individual and Nigeria society” (Nwogu, 2009). Enahoro (2008) opined that Vocational Training is utilitarianism and it is a concept of recognizing the importance of labour. Therefore to train someone in his appropriate field to contribute substantially his quota to the overall good of the nation, he has to pass through Vocational Technical Education and training.

The role of Technical and Vocational Education cannot be over-emphasised. It trains and equips individuals with the skill to combine technology, science and general education that enable them to function efficiently and effectively in diverse sectors of the nation’s economy. No sector can function adequately without competent and qualified skill personnel which vocational and technical education helps to provide. The history and development of America, Germany and recently Japan, China, Brazil and even Ghana cannot be complete without the role that Vocational and Technical Education played in helping to prepare skill and competent individuals who helped to man the various sector of their economy. Nigeria is lagging behind in the labour force of the 21st century because the citizen has not been well developed in the requisite skills and competencies to enable them function and build the economy. According to Dike (2005), no nation can fight a war without an army. In the same vain, Nigeria cannot develop without a well- equipped vocational and technical education as this is the missing link in Nigerian’s development policy.

4. Workshop Tools/Equipment in VTE in Nigeria

VTE teachers need to organise their programme so that tools and equipment required for instruction are readily available when they are needed. Students in Wood Technology Workshop for instance, shouldn’t find that their practice in joints has come to a halt because there aren’t enough pieces of wood and other tools to go round. To avoid educational embarrassments, teachers/instructors are to look ahead in a systematic manner to ensure adequate tools and equipment is provided in the laboratory. There are adequate spaces for workshop practice for training where students acquire practical skills in each area of VTE but the most unfortunate part of it is that tools and equipment are not adequate and the available ones are not maintained.

The present state of facilities in TVE institutions are very poor, and there are no planned measures of maintenance of the already broken down equipment or means of acquiring new ones, there is hardly or no concern on the part of government, teachers and students for the development of the present state of the facilities (Umar & Maaji, 2010).

Provision of tools and equipment must be in line with the stipulated objective of the Federal Republic of Nigeria (FRN) in the National Policy on Education (FRN, 2004, 2008 and 2013) which are:

- i. To provide trained manpower in applied science, technology and commerce;
- ii. To provide the technical knowledge and vocational skills necessary for agricultural, industrial, commerce and economic development;
- iii. To provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man;
- iv. To give an introduction to professional studies in engineering and other technologies.
- v. To give training and impart the necessary skills to individual who shall be self-reliant economically;

Technical and Vocational Education are used as a comprehensive term referring to those aspect 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. Technical and Vocational Education is further understood to be:

- a. an integral part of general education
- b. a means of preparing for occupational fields and for effective participation in the world of work.
- c. an aspect of lifelong learning and a preparation for responsible citizenship.
- d. an instrument for promoting environmentally sound sustainable development; and
- e. a method of alleviating poverty.

The objectives and goals of VTE can only be achieved through a well Structured and

equipped workshop with tools and equipment that are relevant to each area of VTE.

According to Onyene et al (2007) physical facilities and materials used for producing graduates for the world of work are just mere tools and obsolete equipment. Some of our workshops are just like classrooms where there are no adequate ventilation and the issue of electricity is one of the major challenges affecting the effective use of workshop facilities. Whereas regular supply of electricity will improve and sustain the economy of any nation and the nation's economy are hinged on Vocational and Technical Education with adequate tools and equipment in the laboratories.

The perceptions of the public in respect of TVE also reduce the quality of the programme where the skills acquired by those graduates in that discipline are not in line with what is operating in the labour market. Obsolete tools and equipment did not match the technological advancement of our nation Nigeria. Niche (2010) revealed that institutions lack adequate tools and equipment which are necessary for practical education.

5. Problems associated with the use of Tools and equipment in VTE

The success of VTE at any level depends on the availability and adequate modern tools and equipment in our workshop/laboratories. It was confirmed that poor performance of student in TVE was as a result of inadequate and obsolete tools and equipment (Uzoagulu, 1993). For this nation to develop to the fullest and beat the same paste with other developed nations of the world, government must ensure that adequate funds are provided for TVE and ensure proper monitoring through the stake holders.

The stakeholders and the beneficiaries must embark on workshop/laboratories maintenance so as to justify the huge amount of fund released by the government. It was observed by Mbata (1990) that workshop tools and equipment were sub-standard and therefore cannot be easily maintained through reconditioning, reshaping an refurbishing. Lack of adequate tools and equipment do not allow students to be practically upright thereby making them not to fit into the world of work and compete favourably with their foreign counterparts.

Most TVE in Nigeria institutions do not have laboratories or workshop spaces let alone useable tools and equipment and where they exist; they are grossly inadequate and few ones provided for the takeoff in the department are obsolete or grounded (Ojimba, 2012). Most institutions rely on engineering workshop/laboratories as well as their manpower to handle TVE concepts at this jet age (21st century).

Low quality of TVE was as a result of few institutions with laboratories or workshop spaces (Oryem Origa, 2005) opined that only 40% of institutions of higher education in Nigeria have laboratories/workshop spaces for TVE programmes while the remaining 60% do not have at all. In this case, institutions without workshop/laboratory spaces cannot have tools/equipment not to talk of being modern and adequate. The most unfortunate part of it is that graduates of TVE cannot exhibit their potentials/talents maximally in any Nigerian industries, this is as a result of inadequate tools and equipment that are missing in our institutions. That was why Ibehim (1994) lamented that graduate of TVE programmes were being rejected by industries because they had the wrong kind of training in schools.

The backwardness of TVE in the area of development is the issue of obsolete, inadequate training facilities, standard workshop and laboratory.

In institutions where tools/equipment is not adequate with shoddy workshop/laboratories, students are arranged in groups for practical. In this case some students may likely not have access to those tools/equipment that are available in the workshop/laboratory with portable power tools and equipment to function effectively and efficiently in the workshop/laboratories; adequate power supply are required but with the nature of epileptic power supply in Nigeria, the desired goals and objectives of TVE cannot be realized. However, Okala (2005) noted the epileptic nature of electric power supply in Nigeria and therefore recommended alternative sources of electricity in the workshop. He further stated that the high cost of running a standby generator was too high and also recommended that government should take the issue of electricity seriously so that the use of portable power tools and machines can be effectively used in the workshop/laboratories. Thank God that recently the President of Nigeria, Bola Ahmed Tinubu had signed electricity bill into law whereby each state of

the Federation and co-operations can generate electricity. This will bring about noticeable improvement in the area of TVE.

6. Conclusion

The objectives and goals of TVE can only be achieved when graduates within its discipline acquire the skills required in all programmes to perform effectively and efficiently through functional workshop/laboratory with well-equipped modern tools/equipment. However, TVE graduates can only perform in our industries and compete favourably with their foreign counterparts when modern tools, equipment and other facilities are adequate and made available in our various institutions since emphasis is laid on practicals in our institutions as contained in TVE curriculum.

7. Recommendations

To produce functional TVE graduates with the required skills and competence that are employable in our industries and compete favourably with their foreign counterparts. The following recommendations are made:

- A reasonable percentage of budget on education be made available to TVE programme by the government at all levels. From there, well equipped laboratories/workshop, tools/equipment, relevant text books and training manual can be guaranteed to our institutions.
- Tertiary Education Trust Fund (TETFUND) must be encouraged to provide more funds for tertiary institutions by utilizing already provided fund for the projects they are meant for. All Administrators in tertiary institutions must justify the huge amount from TETFUND and procure tools, equipment and modern facilities in all TVE workshop/laboratories.
- Government, organizations and private individual must be encouraged to fund TVE adequately. That will go a long way to assist TVE graduates to acquire practical skills in the workshop/laboratories while in training.

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