

TECHNOLOGICAL INNOVATIONS IN TVET FOR JOB CREATION AND NATIONAL DEVELOPMENT

BY

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Abstract

This paper examined technological innovations in TVET for job creation and national development. It posits that education is veritable tool for any country's development. Therefore, the paper revealed TVET as an educational concept mapped out to ascertain skilled manpower that can foster the self-dependency of Nigerian citizens as well as aid them to contribute to the desired national development. Furthermore, the paper outlined the various constraints foiling national development in Nigeria, as an African nation. Considering these constraints, the study solicited the use of TVET as an educational programme to foster national development but the envisaged challenges of TVET in the Nigerian terrain has foiled its efficacy. Thus the study recommended the technological innovations in TVET for job creation and national development. This, the paper ensured, will foster the attainment of the objectives of TVET programmes in Nigeria. The role of TVET for job creation and national development was no doubt as the paper emphasized its significance in Nigeria's quest for job creation and national development. Consequently, the contemporary changes in a world that is becoming technological has evolved a variety of lapses encompassed by TVET programmes in Nigeria, thus, the paper proffered recommendations that could help foster technological innovations in TVET for job creation and national development.

Keywords: TVET, Job Creation, National Development

Introduction

Nigeria as an African state is richly blessed and characterized with many resources comprising of natural and human resources. She is immensely blessed with ample manpower, scientists and technocrats with unique and useful ideas in the acquisition of vital knowledge and skills that can act as catalysts for national development. It is unfortunate to establish that despite the varied and unique resources that ought to pave way for sustainable development in Nigeria, the under-development rate is progressing at an increasing pace. Nigeria as an African state is alarmingly

poor due to her economic instability, political instability, religious turbulence as well as other unrest cases that are prevalent in Nigeria. The quest for national development in Nigeria has fostered the initiation, proffering and implementation of ideas and policies by both Nigerian governmental bodies and non-governmental bodies. These policies have attempted to facilitate growth and development in Nigeria but the incessant unrest cases in the country have restricted her pace for national development. According to several scholars such as Imogie (2014), Okogu and Umudjere (2016a) and many others; education is the

bedrock of any nation's development. They believe education as a salvaging phenomenon to a country's national development; education as a veritable phenomenon is a life-long process, a continuous and dynamic process that emphasize the dissemination and comprehension of knowledge, values, skills, ethics and norms that foster a change in an individual. William and Aniefiok (2014) buttressed the above view on education when they explained education as a process by which the individual is aided to develop physically, mentally, morally, spiritually and emotionally through the provision of suitable environment and imparting him or her with new knowledge, attitudes, skills and values so that he or she may be useful to the society.

Similarly, Chukwuedo and Omofonmwam (2015) assert that education generally brings about the transformation needed in every society for industrial and technological development. Buttressing this idea on education, it could be recalled that Imogie (2014) argued that no nation can develop to its fullest and keep pace with trends in science and technology without effective and efficient educational system. It should be noted that national development in Nigeria has not enhanced due to low rate of illiteracy among Nigerian citizens. The pace of illiteracy has foiled Nigeria quest for national development, the incessant cases of unrest evolving from unpatriotic and criminal acts by some Nigerian citizens is attributed to the increasing illiteracy rate in the country. Those characterized with illiteracy are ignorant of vital knowledge, skills, values, attitudes, beliefs as well as ethics that are prerequisites for national development due to their absence from the available citadels of learning. Education as a veritable phenomenon fosters knowledge dissemination and acquisition, skills acquisition; as well as ideas

and policies initiation for the spin-off of development in the country.

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Education, according to Nwachukwu (2014) remains a barrier to advancement for vast majority of citizens in developing countries. Buttressing this view, the author cited Oriahi and Aitufe (2010) who opined that many developing countries lack the essential raw knowledge and skills gained through formal education and training. In this regard he posited that Technical Vocational Education and Training (TVET) is a form of education whose purpose is to prepare persons for employment in an occupation or group of occupation. This form of education ensures the training and retraining of individuals to become viable, skilled and hard-working personnels that procures their self-engagement, self-reliance and self-sustenance. To a large extent, this form of education fosters job creation which at a large expense secures national development. The Technical Vocational Education and Training (TVET) is an educational programme that has the mandate of producing required and demand driven industrial or technological manpower for Nigeria (Musa and Okorieocha, 2012, Ansa and kissi, 2013, Okorieocha and Duru, 2013). According to UNESCO and ILO cited in Chukwuedo and Omofonmwam (2015) explain Technical Vocational Education and Training (TVET) to mean those aspects of educational process involving in addition to general education, that deals with the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge related to occupation in various sectors of economic and social life. Similarly, FRN in Chukwuedo and Omofonmwam (2015) affirmed that one objective of TVET is to produce manpower required in the industry commerce and agriculture. The afore-mentioned views on Technical Vocational Education and training (TVET) buttress the vitality of TVET for job creation and national development.

Consequently, job creation and national development in Nigerian is attributed to industrial and technological advancement of the country, and this is enhanced by the available human resources. Chukwuendo and Omofonmuwan (2015) explained human resources as a vital resource that determine and control other resources; this is because individuals are trained formally or non-formally to take charge of other resources in an institution in the bid to attain the defined objectives. The authors further noted that these resources are needed in the industries and are better prepared for the industries via educational institutes. The advent of Technical Vocational Education and Training programmes established by government in the past few decades is geared to foster job creation and national development. Unfortunately, these programmes mapped out by the government have not be sustainable for the Nigerian citizens due to the lack of government initiation and implementation of policies that will address subsequent innovation that can help job creation and national development. This lack of initiating and implementing innovation policies in Technical Vocational Education and Training; this exodus is often aided by the Nigerian government as they foot the expenses of government staff to developed countries to acquire Technical Vocational Education. For example, the Nigerian Army sending her Army to Argentina to learn cattle rearing; it is a humiliating limitation of the Nigerian nation as job creation is hindered and national development discouraged due to the lack of government initiation and implementation of innovation policies in TVET programmes. The Nigerian government is greatly limited in grooming Technical Vocational Education and Training programmes on par with the contemporary technology innovation of the world largely due to the fact that the Nigerian TVET programmes have out-dated equipments

and facilities as well employ few high skilled instructors in the technical vocational education and training programmes and many low skilled instructors in the field.

There is the need for technological innovation so as to ensure Nigerian TVET programmes are of standard that match global trends of policies for sustainable development. In this regard, TVET which is established to aid industrial and technological manpower development in Nigeria is a prerequisite for Nigeria national development; thus, its innovation is vital as it will strengthen the pace of TVET for job creation and national development in Nigeria.

National Development

The term national development connotes an enhanced standard of living of the people in the country; measures of improvement may be material such as increase in the gross domestic product literacy rates and availability of health care. National development as a concept refers to the ability of a nation to improve the live of its citizens. Ani, Onyia and Iketaku (2013) posit that national development goes far beyond the acquisition of technological product like computers, cars, planes etc or constructing the most beautiful building and architectural wonders. It means having good access roads, bridges, airports, dams, stable electricity supply and improved health centres among others. The authors explained further that national development, according to the first decade of the United Nations is equal to economic growth and social change which can be translated at the level of the individual and the society at large. It includes important human necessities in the area of food and nutrition, employment and poverty reduction within the frame-work of equality, dignity and justice; not merely the economic prescription of per capital income, gross national products and annual grow rates (Opubor, 1986 cited in Ani et al, 2013).

The focal points of national development in the above submission according to Ani et al (2013) are individual and societal changes with indications such as quality food, gainful employment, and improved healthcare e.t.c. The authors further explained that a nation cannot therefore be said to have developed when a significant percent of her population are not literate and decay exists in the country's educational system. National development, must, therefore route for change in all areas of the society which include the economy, science and technology sector, education sector, health sector and environment in such a way that the physical and mental abilities of the citizenry are best positioned to achieve beneficial change. This repositioning has to be culturally derived from the internal resources of the country to avoid the perennial problem of western imposed development paradigms which are promethean and therefore antagonistic to indigenous third world post-colonial development efforts (Betiang, 2005 cited in Ani et al, 2013).

National development is a concept that countries of the world are struggling for these countries have solicited and utilized various measures to ascertain this phenomenon. However, the UNDP (2015) posited seventeen (17) sustainable development goals that include: no poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industrial innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life on land, peace and justice strong institutions and partnership for the goals. Thus, the mapped out goals elicit that any nation who is able to attain these goals can be adjudged as a developed nation of the world. In this regards for a country to attain these goals

there are prerequisites and they include: a strong military, an independent economy, a stable political system, tolerance for religious differences as well as enhanced unity among her people. It should be noted that the accommodation of these prerequisites is a channel to attaining the SDGs which emerge national development. From the far gone; no nation of the world is developed because no nation of the world has been able to attain the seventeen (17) SDGs; for instance, one of the SDGs, "No Poverty" is a goal that no nation of the world has achieved. The United States of America which is regarded as one of the developed nations of the world is a victim of poverty; according Bernadette, Jessica and Melissa (2016) noted that 43.1 million people lived in poverty with a 13.5% in 2015. They further noted that the 2015 poverty rate was 1.0% higher than in 2007, the year before the 2008 recession. Also, Germany which is regarded as one of the developed nations of the world according to Deutsche Welle News (2015) is a victim of poverty; it noted in their report that Germany recorded 15.5% percent poverty in 2013. In 2014, the German Newspaper (Deutsche Welle) noted with reference to Germany's National Office for Statistics that one in five Germans are affected by poverty; thus, poverty is prevalent in Germany. Evidently as above, no nation of the world is developed yet because no nation has successfully achieved the SDGs with a special tag on poverty.

Constraints foiling National Development in Nigeria

The quest for national development in Nigeria entails the process whereby desirable positive actions are geared towards enhancing the standard of living in Nigeria. There are envisaged problems confronting the Nigeria's quest for national development and they range from social problems, economic problems and political problems to religious problems. And

this had gravely hindered the pace of Nigeria's quest for national development. These problems confronting national development in Nigeria include corruption, unemployment, political instability, tribalism, nepotism, cronyism, embezzlement of national resources, electoral malpractices, religious crises, dishonesty and terrorism among others too numerous to mention.

Adebayo cited Akamere (2001) and Mbeke-Ekanem (2000) who posited that Nigeria is a culturally diverse entity and as a result, ethnic loyalty rather than national loyalty is promoted among the various people of the country. Thus, the spirit of cohesiveness at the national level is very weak when compared with a sense of belonging that is grounded in tribal history. He also posited ethnocentrism as a constraint foiling national development in Nigeria.

Similarly, the negative concepts disseminated in schools without due consideration of the Nigerian culture and tradition; the persistent cold war among tribes in the Nigeria terrain; the decline in the utilization of Nigerian intellects for Nigeria productivity; the persistent negative political concepts prevailing in the Nigerian terrain; the persistent practice of tribalism, nepotism, cronyism in the Nigeria governance have posed as constraints foiling national development in Nigeria.

Technological Innovation

The concept of technological innovation is a contemporary concept that has transformed the globe to a more advanced abode. This concept of technological innovation is an off-shoot of twin variables "technology" and "innovation"; technology as a variable in this paper portrays the use of scientific ideas and knowledge to create skills that can facilitate an easy and sustainable living of a people while innovation has a variable here, posits as a phenomenon associated with the act of proffering, using and

acknowledging contemporary policies, events, activities and services that aid the increase in quality and quantity of production. Malerba and Orsenigo (1997) opined innovation as a tradable application of an invention as a result of invention integration into economic and social practice. Consequently, the concept of Technological Innovation according to Carlsson and Stankiewicz (1991) can be defined as a dynamic network of agents interacting in a specific economic/industrial area under a particular institutional infrastructure and involved in the generation, diffusion and utilization of technology.

However, technological innovation which poses as a vital aid to a growing society has emanated global technological competitiveness. The concept of technological innovation fosters dynamics of technology in the society; it elicits the upgrade or introduction of new technological gadgets and products that facilitate easy living. Technological innovation emphasize that the stimulation of knowledge flow is not sufficient to induce technological change and economic performance. There is, therefore, a need to exploit this knowledge in order to create new business opportunities. This stresses the importance of individuals as sources of innovation; something which is sometimes overlooked in the more macro-oriented, nationally or sectorally oriented innovation system approaches (Hekkert, Suurs, Negro, Kuhlmann and Smits, 2007).

Technological innovation as a vital concept fosters the need for transformation. It elicits the presence of upgraded versions of products, processes, business etc. that suit the sustainability of a society. Technological innovation in TVET is a vital necessity as it will help to initiate and formulate modern policies that can establish TVET for job creation and national development. This is envisaged in the improved modern technology that can facilitate

easy and efficient work pace, skill acquisition and to a large extent foster self-dependency in the citizenry. The outcry for technological innovations in TVET is necessary as it will help discard outdated technologies and facilities and evolve updated and modern technologies and facilities.

Technical Vocational Education and Training

Technical Vocation and Educational Training (TVET) is an occupational training programme mapped out by educational authorities to foster the dissemination and acquisition of skills and ideas geared towards enhancing people's standard of living. Ansah and Kissi (2013) see TVET as an educational programme that is designed to equip people with the technical and professional skills needed for industrial development as well as social progress of any country. In like manner, Dawodu (2006) explained TVET as the reliable vehicle for self sustenance, economic prosperity and political supremacy of a nation over others. Consequently, FRN (2004) sees TVET as a comprehensive term referring to those aspects of educational process involving in addition to general education, the study of technologies and related sciences as well as the acquisition of practical skills, attitudes, understandings and knowledge relating to occupations in various sectors of economic life.

TVET according to Alhasan and Abdulahi (2013) is summarized to include:

1. An integral part of general education
2. A means of preparing for occupational fields and effective participation in the world of work
3. An aspect of lifelong learning and preparation for responsible citizenship
4. An instrument for promoting environmentally sound sustainable development
5. A method of alleviating poverty

Also, Olaitan (1990) posited TVET to include the following:

Skill and knowledge required in the society

Economic development

For work and economic activity

For job creation

Self respect, social contact and participation

From the far-gone, TVET is an educational programme mapped out by educational authorities to enhance occupational skills and knowledge acquisition in order to foster job creation and to a large extent national development.

Objectives of Vocational and Technical Education

Vocational Education possesses well articulated objectives for human resources development which it desires to achieve. The FRN (2004) as pointed out in Abubakar, Abdullahi, Ossai, Owolabi, and Leonard (2014) highlighted the following as objectives of Vocational Education:

1. To provide trained human resources in applied technology and commerce, particularly at the sub-professional level;
2. To provide technical knowledge and vocational skill necessary for agriculture, industrial and commerce development and economic growth;
3. To provide people who can apply scientific knowledge to the improvements and solutions of environment problems for use and convenience of man;
4. To give an introduction to professional studies in engineering and other technologies;
5. To give training and impart the necessary skills and other skilled personnel who will be enterprising and self-reliant and
6. To enable, both young men and women to have an intelligent understanding of the increasing complexity of technology

Constraints Foiling TVET Programmes

Technical and Vocational Education Training (TVET) programmes are vital programmes geared towards national development. TVET is a programme highly recommended by public administrators as it enhances independence of economic growth and stability. TVET, as an educational programme encompass a variety of constraints that foil its capacity to promote national development. These constraints include inadequate funding, inadequate infrastructure, and societal neglect of skills' training, inappropriate training of TVET teachers as well as limited institutional and personal capacity.

TVET as an educational vocation programme in Nigeria, experiences low employment of their graduates; thus, leading to suggest that TVET been too supply-driven and focuses on training which has a low market demand (Akyeampong, 2010). In the same vein, Ansah and Kissi (2013) posit that the lack of national policy framework to guide the management and implementation of TVET programmes in a coordinated manner is another constraint of TVET programmes. They further noted that the obsolete and inadequate training equipment and tools; lack of training equipment materials; inadequate number of qualified instructors with requisite industrial practical experience; lack of linkage between training institutions and industry and lack of relevance of institutional training to the needs of industry are constraints foiling the implementation of TVET programmes.

Consequently, Fluitman (2005) argued that TVET has suffered as a result of the focus on other development goals; the educational curriculum is driven towards a variety of developmental goals, but the low patronage of TVET programmes in the curriculum has posed as a constraint. Thus, it should be re-appraised to suit the TVET programmes. Ugochukwu and Charles (2014) buttressed the afore-mentioned

view when they outlined lack of modern facilities; lack of staff training; low level of vocational education training and industrial development; poor learning conditions; lack of funding of most activities in technical colleges and lack of teachers' motivation as constraints foiling TVET programmes implementation. In a bid to foster the efficacy of TVET, Abubakar, Abdullahi, Ossai, Owolabi, and Leonard (2014) posit poor organization and supervision of industrial training, inadequate facilities, inadequate qualified staff, inadequate funding, and major dependence on foreign technology as well as politicization of administration as constraints foiling TVET programmes in Nigeria.

Role of TVET for Job creation and National Development

TVET as an educational programme is geared towards job creation and national development. The dissemination and acquisition of occupational skills and knowledge has aided Nigerians to be creative and self-employed. In this regards of linking skills development to job creation and national development; this has an immense implication as it fosters the citizenry to be self-reliant, hard-working, and creative and expertise in technical skills that enhance immense job creation for Nigerians and in like manner agitate national development (Nwachukwu, 2014). TVET as an educational programme in Nigeria has evolved as an imperative tool for job creation and national development; this is as a result of its dissemination of vocational skills that fosters self-dependency in the citizenry and the country at large. Alhasan and Abdullahi (2013) explained that skill training enhances productivity and sustains competitiveness in the global economy. They buttressed that global nations are renewing efforts to promote technical and vocational education and training. This, according to them, is because it is the only way to prepare young people for world of work,

which reaches out to the marginalized and excluded groups to engage them in income-generating livelihoods. This is because, the increasing rate of unemployment in Nigeria is a correlate of declined efforts geared towards national development; this is also attributive to the decline in TVET enrollments in which the citizenry are not motivated to acquire necessary vocational and technical skills that can buttress national development. Consequently, TVET programmes if effectively implemented will foster job creation and national development in Nigeria.

Theoretical Frame-Work

This paper is anchored on the psychomotor model by Ezewu (1984); Ezewu proposed a psychomotor model called Psycho productive domain with three broad levels: low level, middle level and higher level. Under the low level is understanding of terminologies, scope of job or task, job specification, instruments and materials. The middle level has two components: task identification which explains tasks in a job and breaks job into tasks; and task-elements specification which explains task-elements, selects appropriate materials and instruments. Similarly, the high level has two components: execution which Identifies task elements, handles instruments and materials properly, executes with required speed, executes according to specification, co-operates with necessary others, persevere; as well as output meets standard or specification, functions according to standards (Okwelle, 2013).

In developing this model, Ezewu was concerned with the extent to which this model could be applied to the scope of learning outcomes in technical and vocational subjects/courses. The model explains psychomotor behaviour in terms of low level of understanding technologies and task analysis to high level of execution and output. However, it does not embrace certain aspects of

psychomotor skills such as affective behaviour. Nevertheless, it is noteworthy that Ezewu's psycho productive theory came about based on the goals of TVET in Nigeria (Okwelle, 2013). Consequently, this model is vital for this paper as it aids TVET programmes to actualize the mapped out goals geared towards job creation and national development.

Conclusion

TVET as an educational programme geared towards the dissemination and acquisition of vocational skills that foster independence in the citizenry is a veritable tool for job creation and national development. This is because, an individual with a vocational skill is a prospective individual as he or she is capable to manipulate and influence the finance and financial institutions of the state. He is one of that can contribute immensely to the growth of the country's economy with his or her vocational potentials.

From the fore-going, it is apparent that the TVET programme is vital for job creation and national development; but the contemporary neglect of TVET institutions has hindered its capacity for job creation in Nigeria and to a large extent foiled Nigeria's quest for national development. Alhasan and Abdullahi (2013) buttressed the above view, when they posited that less than one percent of secondary schools were oriented on technical and vocational skills. This has evolved the need for technological innovations in TVET programmes so as to aid job creation and national development. It is in this regard that Nigeria signed an agreement with UNESCO's NBTE, geared to implement a project that aims to better equip large numbers of young Nigerians for a world of work.

Recommendations

Consequently, there are some constraints foiling TVET programmes outlined in the

study, the afore-mentioned constraints has necessitated the following recommendations:

1. TVET centres should be fostered by educational authorities to pose as lucrative and conducive skill acquisition centres;
2. Educational authorities should avoid subsequent TVET syllabus change to enhance an efficient running of TVET programmes;
3. Adequate funding of TVET programmes should be ensured by the government to elicit the efficacy of TVET programmes
4. Articulating TVET curriculum with the needs of the society
5. Bills on job creation and employment through TVET should be fostered in the National Assembly

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