DEVELOPMENT AND INNOVATIONS IN TECHNOLOGY AND VOCATIONAL EDUCATION IN NIGERIA

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Abstract

The development and innovations in technology and vocational education could be a veritable instrument for national economic development in Nigeria. The growing awareness of the need to adapt technology and vocational education to meet the rapid global economic requirement is absolutely essential. Thus, technology and vocational education is a mechanism that could help for improving the quality of workforce by humanizing their mobility, adaptability and productivity. Technology and vocational education indirectly could contribute to the enhancement of firms' competitiveness in the globalized world. This is so because one of the most important features of technology and vocational education is its orientation towards the world of work and the emphasis of its curriculum on the acquisition of employable skills. It is important that government should focus on acquisition of employable skills for the youths so as to divert their attention from these social vices that have bedevil the nation. Thus, it is absolutely essential to examine the development and innovation achievable in technology and vocational education in Nigeria. It is concluded amongst others, that Nigeria government should look inward and recognize the fact that technology and vocational education as the bedrock for meaningful technological growth and national development. It is recommended that the government, stakeholders, policy makers in Nigeria should focus on technology and vocational education, quality assurance and best practices that have worked in advanced countries around the world. Also the government should adequately fund, plan, implement, and manage technology and vocational education programmes in

technical institutions in Nigeria. Finally there should be a synergy between the school industry linkages and where students are trained must be a replica of the environment in which the students must subsequently work.

Keywords: Development, Innovation, Technology and Vocational Education

Introduction

Advancements in technology and vocational education have left all facets of the society affected, mostly in a positive way. To attain the sustainable development and innovative goals, educators must be willing to adopt technological and vocational approaches that promote increased participation, collaboration and dynamism in the learning environment and also to learn effectively.

Innovations refer to the introduction of new ideas that cause changes in a given system and society. These changes may be educational, scientific or technological that promotes learning. Innovations and evolutions are essential to the development and survival of individuals, families and nations (Serdyukov, 2017). Development and Innovations in technology and vocational education are of particular importance because education plays a crucial role in creating a sustainable future.

Innovation is the process of doing new things. To innovate is to look beyond what we are currently doing and develop a novel idea that helps us to do our job in a new way. Innovation in the view of Jeremiah and Alamina (2017) is a deliberate novel and specific departure from old practices that would have been perceived better way of doing something. According to Serdyukov (2017), Innovation can be directed toward progress in one, several, or all aspects of the educational system: theory and practice, curriculum, teaching and learning, policy, technology, institutions and administration, institutional culture, and teacher education. Innovation means a deep thought that brings new ideas, renewing, changing or generate new plans or theories. It also means a vision which tends to creating new prototypes, either from extinct products or present ones, this serves as a platform in which new ideas are being created.

Technology and Vocational Education is an educational system that offers courses leading to the acquisition of specific skills to enable individuals to perform certain jobs. According to Egumu, Akpotohwo and Ogeibiri (2017), technology and vocational education refers to educational process which involves, in addition to general education, the study of technologies and related sciences, skills and knowledge relating to occupations in various sectors of economic and social life. Technology and vocational education is directed towards the preparation for occupational life since the recipients are equipped to face the challenges in the world of work. It entails the transmission of the knowledge and acquisition of skills that are

related to various occupations of white collar jobs but become employer of labour. Technology and vocational education plays an orientation role towards the world of work and its curriculum emphasizes on the acquisition of such employable skills, which is a fundamental necessity for driving the industrial and economic growth, and it is a key to building this type of workforce which a Nigerian need to create wealth and emerge out of poverty. Nwogu and Nwanoruo (2014) added that, technology and vocational education gives individuals the skill to live, learn and work as productive citizens in a global society.

Development

Development is a well accepted and all embracing concept in all phase of life. It is the dream and vision of individuals, organizations, groups and countries all over the world. Every phenomena predisposes itself to development, which is a process involving integral transformation from its current stage to a more functional, productive and result oriented sustainable state (Nwachukwu & Udenze, 2019). Development therefore has become one of the most sorts after condition by everyone both at the individual, organizational, societal and national levels. Obodoechi (2016) states that development entails a shift which is upward from one point to another over a period of time, especially where the movement is a positive one. Obodoechi (2016); remarks that development is the process of bringing out of the capabilities or possibilities of a phenomenon to a more advanced or effective state. Development involves progression, movement and advancement towards something better. It is an improvement on the material and non material aspects of life.

Innovation

Innovation is the process of doing new things. To innovate is to look beyond what we are currently doing and develop a novel idea that helps us to do our job in a new way. Innovation in the view of Jeremiah and Alamina (2017) is a deliberate novel and specific departure from old practices that would have been perceived better way of doing something. According to Serdyukov (2017), Innovation can be directed toward progress in one, several, or all aspects of the educational system: theory and practice, curriculum, teaching and learning, policy, technology, institutions and administration, institutional culture, and teacher education. Innovation means a deep thought that brings new ideas, renewing, changing or generate new plans or theories. It also means a vision which tends to creating new prototypes, either from extinct products or present ones, this serves as a platform in which new ideas are being created.

Innovation is described as a new or improved product that differs significant from the previous products and that has been made available to potential users (OECD/Eurostat, 2018). Innovation is capable of introducing new skills demands that impact education, training and employment. OECD, (2015) maintained that innovation is the main driver of future social and economic development. Innovation

and technical changes are said to be associated with an increasing demand for high skilled workers, and a declining demand for low skilled workers in modern economies. Innovation therefore is perceived as a'solution' to different types of social, economic and environmental problems, with a specific focus on skill demand. Innovations in technology and vocational education programme are ultimately directed at changing qualitative and/or quantitative factors of learning outcomes:
Qualitative: better knowledge, more effective skills, important competencies, character development, values, dispositions, effective job placement, and job performance.

Quantitative: improved learning parameters such as test results, volume of information learned, amount of skills or competencies developed, college enrollment numbers, measured student performance, retention, attrition, graduation rate, and number of students in class, cost, and time efficiency.

Technology and Vocational Education

Technology and vocational education (TVE) is associated with education for work or a kind of education purposely designed to equip learners with professional skill and competencies needed to fill the gap in manpower development for a sustainable economy and development. According to Gonzovic (2013) TVE is a systemic process of acquiring and upgrading requisite knowledge, attitudes and skills needed for self reliance and sustainable development. Technology and vocational education is needed for self and national development. This implies that an individual who acquires those competencies and skills in TVE is already empowered to be self reliant and can also contribute profitably to the national development (Ogbuanya & Okoye, 2015). Such individuals have greater opportunities to earn a livelihood as well as contribute to national development. Hence, technology and vocational education is designed to offer training and education to improve individual's general proficiency in relation to their occupations. Thus, a sound practice of TVE seemed to be the secret behind the success of most of the fast developing and developed nations of the world.

Ruqayyah (2013) opines that enhancement of technology and vocational education and training is a strategic choice for sustainable development and economic growth and also posits that no education reform will work in an environment constrained by corruption, lack of infrastructure, electricity and incentives and policies that can promote private sector development.

Vocational education is that form of education that is aimed at preparing the individual to acquire knowledge, skills and competencies that will enable him perform well on such occupational tasks. Vocational education deals with the training or retraining designed to prepare individuals to enter into a paid employment in any recognized occupation or to be self reliant (Ojimba, 2013). It refers to

systematic learning experiences that are designed to fit individuals for gainful employment in recognized occupations as semi skilled workers or technicians or sub professionals.

Technology education, essentially aims at developing techniques, devices, procedures and the process for doing things. Vijay (2017) states that, Technology Education is instrumental in making the remarkable contribution to economic growth of the developing countries by way of suitable manpower production according to the needs of the Industry, Society and the Global World as a whole. Technology and vocational education is viewed as an organized programme of Education that prepares learners for entrance into a particular chosen vocation (Adegbenjo& Olubato, 2013). Technology and vocational education according to Ikemike (2016), is an education designed to prepare individuals for gainful employment as skilled or semi skilled workers in a recognized occupation such that, such individuals could be self reliant. Oguntuyi (2013) opines that, vocational and technology education is an educational training which encompasses knowledge, skills, competencies, structural activities, abilities, capacities and all other structural experiences for securing jobs in various sectors of the economy or even enabling one to be self dependent by being a job creator. Technology and vocational education remains the popular means by which trained manpower is produced for economic and industrial growth of both developed and developing countries. Technology and vocational education is the hub of the economy of any nation just as the wheel rotates around the hub, the economic sector of Nigeria rotates around vocational and technology education considering the current socio economic, scientific and technological development of Nigeria; Technology and vocational education facilitates the acquisition of applied skills and basic scientific knowledge (Obiayi & Olisa, 2022).

The vision of technology and vocational education can be expressed as follows;

1. To provide trained manpower in applied science, technology and commerce particularly at sub professional grades.
2. To provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development.
3. To provide people who can apply scientific knowledge to solve environment problem for the 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 leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self reliant.
6. To enable our young men and women to have an intelligent understanding of the increasing complexity of technology.

Innovative Practices in Technology and Vocational Education

Innovative practices in technology and vocational education are discussed under the following subheadings;

1. **Innovative Practices in Technology and Vocational Education Curriculum:** Curriculum is a plan developed with the intention that when it is properly executed, the educational goals will be achieved. It represents the total experiences to which all learners must be exposed; the content, performance objectives, activities for both teachers and learners, teaching and learning materials and evaluation guide are provided (Ejidike & Oyelana 2015). Curriculum of technology and vocational and is expected to equip learners with skills that will make them self reliant, prepare them to enter into jobs and progress in them. The technology and vocational education curriculum has under gone some innovations and modifications in the area of contents pattern, implementation and revision. It is only through this standardization of the curriculum that the programme can boast of having the capacity of preparing and equipping the youths for effective employment and reliability. It can be deduced that the need for the innovations of the curriculum was as a result of three major issues shaping the development of nations worldwide and influencing the world of knowledge today which are identified as globalization, information and communication technology (ICT) and entrepreneurship (Federal Republic of Nigeria, FRN, 2014). The contents of the innovations in the technology and vocational education curriculum should be relevant to the needs of the nation.

2**. Innovative Practices in Teaching and Learning in Technology and Vocational Education**

The core objective of teaching is passing on information or knowledge to the minds of the learners. Any method using computers or modifying the existing conventional chalk talk method are innovative if they ultimately serve the attainment of core objective of teaching (Okoye, 2013). In the conventional methods of teaching, the teacher controls the instructional process, the content is delivered to the entire class and the teacher tends to emphasize factual knowledge. Any teaching method without destroying the objective could be considered as innovative methods of teaching. The core objective of teaching is an innovative practice which could be a pathway created to further the interest of the student and the institution. Teaching with technology engages students with different kinds of stimuli involve in activity based learning. Technology makes the material more interesting. Collaborative teaching, sometimes called cooperative teaching or team teaching also considered as an innovative teaching, it involves educators working in tandem to lead, instruct and mentor groups of students (Jayashree, 2017).

Challenges of Technology and Vocational Education

Technology and vocational education cannot contribute greatly to the reduction of unemployment and poverty, because it is handicapped by diverse challenges

confronting it. Ozoemena (2013) emphasizes that the vision of technology and vocational education has not been achieved; it has failed in developing a self reliant individual due to several challenges facing technology and vocational education robbing the nation of some contributions which individuals would have made to the economy. Among these challenges are:

1. Inadequate Funding of Technology and Vocational Education Programmes: Government of Nigeria has not been able to meet the 26% UNESCO budget requirements on education (Ordu, 2017). Inadequate funding is a major problem responsible for poor development of technology and vocational education today. In addition to this, the little fund provided relapse and are embezzled by top officials in charge of its implementation.

2. Inadequate Equipment and Training Infrastructure: Lack of adequate machines, equipment and tools in technology and vocational education has created a serious negative impact to the level of knowledge and basic work skills, which the students supposed to achieve in the area of vocational and technical production. Okeke and Eze (2014) state that most technology and vocational education departments, in our higher institutions of learning do not have well equipped laboratories, workshops and usable infrastructure. Where these exist, they are grossly inadequate, obsolete and in a dilapidated state. Due to inadequate funding, institutions are not able to employ additional personnel. Also, lack of funding for tertiary institutions leads to inadequate and outdated library books and journals, inadequate scientific materials, nonexistent fund for conferences and exchange programme for academic staff auditoria, desks, staff offices, seminar/conference/board rooms, laboratories, workshops, studios, farms, computer laboratories and services, network connectivity, multimedia system, public address system, slide, and video projectors etc. According to Ogunode and Agwor (2021), reasons for inadequate infrastructural facilities are inadequate funding of secondary schools, poor infrastructural facilities planning, and poor qualities of infrastructural facilities, institutional corruption, ineffective monitoring and evaluation of infrastructural facilities, increased in student population, damages of facilities by students of secondary school.

3. Inconsistent Government Policies on Technology and Vocational Education: Inconsistency in the formulation and implementation of technology and vocational education policies has been a major setback to the advancement of technology and vocational education. Lack of follow up and continuity in government as a result of selfishness and corruption has been one of the key factors facing technology and vocational education and national development.

4. Poor Staff Training and Retraining Programme: Poor training and retraining programme is a major problem facing technology and vocational education lecturers working in higher institutions of learning across the country. Many lecturers are still

teaching with the knowledge and skills acquired during their higher education. Teachers need constant training and retraining programme to upgrade their knowledge and skills. Most technology and vocational education teachers in our colleges and universitieshave never since their graduation enlisted in re training programmes in order to keep abreast with the ever dynamic innovations associated with the never ending needs of the society (Obiyai & Olisa, 2022). The training of teachers is supposed to be a continuous exercise to ensure consistent improvement in the quality of their output. Technology and vocational education lecturers need constant training and retraining programme to upgrade their knowledge and skills.

5. Lack of Motivation for Technology and Vocational Education Teachers: Teachers are the pivot on which educational process things. They can influence the teaching/learning outcomes either positively or negatively because they determine the quality of instructional delivery and also influence the quality of Education when it comes to implementation of the curriculum and educational policies. Teachers are to be considered when addressing issues such as quality assurance, qualitative delivery (teaching), quality context and quality learning outcomes. Study carried out by Ezechi (2016) showed that science teachers in Nigeria are not motivated. Science teachers are faced with poor condition of service, their allowances are not paid regularly, and they are not given opportunities for developmental programmes and were not granted funds for creativity. All these have affected teacher's performance in contributing towards learning. Omorogbe, and Ewansiha, (2013) opined that teacher salary is very important as a predictor of student's achievement because it has a capacity to uplift the other aspects of teacher quality.

6. Irregular curriculum modification:The world is a dynamic society and everything in it including education is dynamic, hence the revolution in technology and vocational education. This is the society where human needs, method of production of goods and services, our taste for goods and services, and of course, preferences for our daily needs, etc. have been influenced by innovations in technology and vocational education. Innovations in technology and vocational education have opened up new challenges in various occupational fields to the effect that such methods that were applied two decades ago are no longer the methods of application to deliver similar functions today. This is applicable in all fields of human endeavor and those who are keying in are doing so through changes and modifications of academic programmes. The absence of regular programme evaluation is greatly affecting the programme and her products. Some of the courses and course contents have been in some programme units since their introduction irrespective of the fact that such courses and their skills are no longer relevant in industries.

Development and Innovation in Technology and Vocational education

Technology and vocational education have become crucial factors for sustainable development and innovations worldwide. They both have contributed immensely to

the material progress of nations. It is in fact generally accepted that the adoption of a scientific frame of mind is a prerequisite for development and innovations (Iniobong, 2014). Technology and vocational education is the main driver for innovation to happen (Serdyukov, 2017; OECD; 2016). Many articles have discussed innovation in respect of technologies and vocational education. Findikoglu and Ilhan (2016) state that innovation does not necessarily mean the adoption of the latest technology and vocation, according to them, innovation and technology adoption are two different terms that are however interchangeable. It must be accepted as a process to deliver engaging learning to students through the use of technology. Using only ICTs in teaching and learning is not entirely mean innovation and it is not the primary goal in education (Findikoglu & Ilhan, 2016). It will facilitate the learning processes or make the structure of the conveyed content to students much more presentable and easier to understand, and it surely will save more time and resources compared to the traditional way.

The Need to Strengthen Technology and Vocational Education in Nigeria

The need to strengthen technology and vocational education in Nigeria is consequent upon many factors including:

a) **Weak Economy:** Nigeria falls within the developing nations. However, Nigeria falls within 20 countries with the widest gap between the poor and the rich. It has a GNI index (measure of gap between the rich and the poor) of 46.5 in 1996, 48.8 in 2010 and 39.7 in 2011 (World Bank, 2013). Nigeria's human development index (HDI) is ranked 153 out of 185, behind countries like Malaysia (64), Brazil (85), China (101), South African (121), Ghana (135) and India (136) (UNDP, 2013). Nigeria has made a less than impressive show in the latest Global competitiveness Index for 2019/2020, a survey aimed at identifying the quality of the macroeconomic environment, the state of a country's public institutions and its level of technological readiness.

b) **High Rate of Unemployment:** The truth is that the unemployment level in Nigeria remains a dangerous one to the extent that even countries that witnessed the Arab Awakening did not have such high level of unemployment (Onwusa, 2021). Could you imagine what happened early 2014 where hundreds of thousands of youths applied for less than 4500 vacancies in immigration service? There were stampeded that led to death of not less than 20 youths in the country (see dailies of March 16, 2014. The nation's youth under/unemployment is shooting up the sky. Graduates find it difficult to fit into any type of skilled or semi skilled labour, while at the same time it is becoming apparent that the majority of them cannot afford the expenses to further their education. The Nigerian educational system equips them with book knowledge for office work that hardly exists. In other words, there is a mismatch between training and labour market skill demands. This ugly situation has kept Nigeria in perpetual bondage of economic frustration and calls for a rethink of the nation's education

system, particularly as with regard to TVE.

c) **Increase in Crime Rate:** The Nigerian security issues pertain more to the people and national development, rather than the military and territorial defense. So many uprisings, insurgences that result in destruction of lives and property in various parts of the country have their roots in illiteracy and idleness. Many unemployed youths embrace crime, law breaking and criminality as represented by armed robbery, cultism, prostitution, frauds (yahoo boys), and stealing by false pretenses among other vices; yet a sizeable percentage are also indoctrinated to embrace extremism and terrorism (Kayode, 2013), National Bureau of Statistics, NBS, (2013) recorded that since 2009, more than 104 foreign nationals have been kidnapped in Nigeria. Off course we dare not talk about Nigeria citizens that have been kidnapped since it has turned to a daily occurrence. Imagine in a State where bandits and insurgents invade a police station, disarm the police in a broad day light and hold the police in hostage for about an hour while attacking a bank just about 100 meters from the police station. This incident took place on 15th October 2013 at Markarfi divisional police station in Kaduna State (naijapals.com, 2013).The same naijapals.com (2013) reported that a businessman was killed in Lagos for refusing to settle area boys.

Strategies to Strengthen Technology and Vocational Education in Nigeria

Many strategies can be advanced to strengthen technology and vocational education in Nigeria, and these include:

a) **Development of indigenous curriculum:** The main idea behind any functional TVE program is to fill the need of the immediate environment then beyond the environment. It is time to use own initiatives in developing the curriculum that is relevant to economic and social needs of the society. TVE curriculum should be revised to shift from single to multiple skills, build from local market opportunities to foster local innovations and technologies than over dependence on imported ones. Inasmuch as Nigeria desire to join in the global technological train, it must put into consideration the conditions of its natural environment, culture and resources. Eze and Okorafor (2013) opine that relevant curriculum will attract the right people and engender the use of local ideas, tools and materials. Thereby minimizing dependence on imported technologies and products and stimulating the intellect of Africans to improve indigenous technologies and materials.

b) **School industry linkages:** In this era of globalization where knowledge and problem solving trump manual skills, TVET training institutions no longer function as isolators' component in the labour market. It will be a good strategy to work out a close co operation between TVE schools and employers to adapt existing materials to the training needs of changing occupations. This will make

it possible to improve the match between training provision and demand, and to mobilize additional resources for effective training in the schools. School industry linkage can be achieved through; constitution of advisory and curriculum development committees with members representing employers and the schools, vocational guidance and placement activities, surveys of local employers, and training strategies that include periodic, supervised placement of trainees for work experience (Okorafor, Uduanochie & Achukwu, 2014; Nnajifor, 2014). Further to this, utilizing information on employment rate by skills levels, economic returns on different levels of training current vacancy rates, and employer projections employment opportunities are likely to expand in the medium term. Such feedback enables training agencies and institutions to meet the training needs of the clientele and the world of work (Ibeneme, 2013).

c) **Attitudinal re orientation:** Developing awareness is the first step of re orientation a process which encompasses imbibing better principles, skills, perspectives and values. It is only when the leaders and the public are aware of the contributions of TVE that there can be a strategic educational program for producing a productive workforce that can move the nation forward; rather than educational program for academically less privileged. This can be done through campaigns, workshops, exhibitions.

d) **TVE teachers' professional development**: Qualified teachers in field of TVE are in short supply, there is the urgent need to revitalize the Technical Teachers Training program, TTTP's initiative of the Federal Government. This will enhance tuning out in good quantity and quality, the number of TVE teachers that will facilitate the achievement of TVE goals. Beside, TVE teachers should be supported for advanced capacity development through scholarships and fellowship award. Technical teachers should be given additional incentives to develop their ICT capacity; this will go a long way in expanding training opportunity for TVE.

e) **Inclusion of entrepreneurial skills in TVE in Nigeria:** It is unfortunate that even the graduates of TVE are among the sea of unemployed youths in Nigeria it is no doubt that the technical skill is very important, but also very important is the knowledge on how to put those skills to use. Having the technical skills with poor entrepreneurial knowledge on how the use the skills, is like having fine shoes but badly wounded feet to put them on. TVE students/trainees should be exposed to the business environment and other requisite entrepreneurial skills involving innovation and creativity, ICT, and computer skills, Entrepreneurial marketing, risk taking, entrepreneurial passion development, persuasiveness and so on. In the view of Ibeneme (2013), the entrepreneurship program should cover contents as achievement motivation, market environment, financing, product selection, marking, skill development, management, production, procurement, personnel,

legal systems and communication skills. It can be adapted in low skill occupations in which entry is easy because of low capital requirements.

f) **Expansion of training opportunities and facilities:** There is need to expand TVE institutions and facilities. However, care must be taken not to compromise quality; as one of its philosophy states that TVE should not be attempted if it cannot be adequately provided for (Nnajiofor, 2014). The new information technology (IT) has the potential to enhance the flexibility of TVE delivery to accommodate poor candidates that cannot afford to be out of workforce for the training, even when it is free. Systematically, IT could be employed in offering shorter, but more intensive course or providing training at convenient time and locations. However, this demands that teachers" ICT capacity be developed.

g) **Provision of resource centres:**Technology and Vocational educators believe that meeting the recurrent costs of paying qualified managers and instructors and providing up to date teaching materials and maintenance are essential to achieving good training outcomes. Since the provision of facilities for TVE is very costly, it would be wise to provide a well equipped central resource center that can serve many schools within a geographical region. This will also enhance collaboration and exchange of ideas.

h) **Support for small scale enterprises:** The business environment in Nigeria is very hostile. The exorbitant charges extorted from entrepreneurs has pushed some out of business. Indigenous small scale industries should be encouraged through reduced tax and other rates. They should also be given loans with minimal interest rates, although, most affluent Nigerians prefer to invest their money in commerce instead of industries. The claim that inadequate physical infrastructures such as transportation, electricity, telecommunication and water supply hinder industrialization is to ignore the fact that these infrastructures are the products and not the agents of industrialization. Proliferation of small scale industries will reduce the much value attached to certification in Nigeria thus competency in job performance will be appreciated. The much discrimination in the type of institution (University, Polytechnics and College of Education) and type of training (formal or informal) will be minimal. As a result, more candidates will enroll into TVE programmes.

The Importance of Technology and Vocational Education for National Development

1. TVE addresses technological change. The acceleration of changes in technologies and vocational education prompts the industries to higher highly skilled workers. Without them, it would be difficult to reap most of the returns from technological progress

2. TVE contributes to capital skill complementarities. A higher level of human capital enables machinery and plants to be used more efficiently, raising the rate of return on investment. Investment in physical capital equipment, is an important determinant of growth. But, it needs a highly skilled worker to master technologies in newly acquired capital equipment.

3. **TVE addresses trade openness, competition and foreign direct investment (FDI):** With globalization, skills, rather than the resource base of the region determine their competitiveness. Globalization raises the capital flow, which, in turn, raises the demand for skilled manpower. A lack in highly skilled labor may deter the flow of FDI to that particular country.

4. **TVE addresses changes in work organizations:** The demand and effective use of skills within enterprises depend on the ways in which work is organized. The changes of organization and work practices in high performance enterprises have an implication on the skills required of employees. In this type of organization, there are self managed work teams, multi skilling, job rotation and cross training and the devolution of decision making. It only works if employees acquire technical skills in addition to those normally required in a traditional organization.

5. **TVE improves productivity:** With the acquisition of skills, workers are more productive and able to produce more output for a given amount of time and effort. Productivity also depends on the work of team members. Through TVE, they learn to work with one another about doing the job effectively and efficiently. This is true when they undergo on the job training.

6. **TVE delivery systems are well placed to train skilled and entrepreneurial workforce:**that some countries need to create wealth and emerge out of poverty. The problems of unemployment and reduces the number of people who depend on government for job. When the youths and adults are trained vocationally or technically, it would enable them to be self reliant in different areas such as electrical, plumbing, automobile, vulcanizing, computer engineering, GSM repairs, and cloth weaving and so on.

7. TVE is always serving as a motivating force in individuals to work for the national development because it stimulates technological and industrial development through the production of competent and honest workers who are capable of utilizing the abundant natural and human resources available in a country for economy and industrial growth and development.

8. **TVE could help to bring about rapid economic development:** The survival of individuals will ensure the survival of the country as a nation. To

continually meet the needs of the present generation means there must be continued economic growth.

9. **TVE also encourage local technology** could be developed by indigenous technicians and technologists. It should be emphasized here that every society has its own peculiar problems. Therefore, it will take the ingenuity of local artisans, craftsmen, technicians and technologists to design and fabricate tools, equipment and simple or complex machines to solve local problems.

Strategies for Implementation of Functional Technology and Vocational Education in Nigeria

Functional TVE could be implemented in three different ways. These are:

1. School based TVE

a. Compressive high/secondary schools Here vocational subjects are offered as elective subjects and students take these subjects according to their interests and aptitudes. In our school system, several vocational subjects are offered mainly for those who have no inclination toward academic field. Some vocational subjects are offered also to students who are good academically. They take the subject as an elective.

b. Vocational and technical schools: Here vocational education takes place mainly in vocational and technical schools at the secondary level. These institutions run parallel with academic schools but are focused on TVE. Presently, a technical and vocational school isa three year programme in the senior secondary school.

2. Non school based centers

These centres are normally run by ministries and agencies such as Ministry of Youth and Sports, Ministry of Human Resources, Ministry of Higher Education, and State agencies, mainly for youths who have completed secondary education or a part of secondary education. The training can be variable in length, from modular courses to short courses or even lasting one to three years. At the end of the training there will be an award of certificate by the respective institutions.

3. Enterprises or in service training

Courses are offered within the enterprise through on the job training or apprenticeship scheme. These are tailor made courses offered by the experts within the enterprise or by people outside the enterprise. The main purpose is to equip or update knowledge or skills required of the workforce to operate new equipment or manage new projects.

Conclusion

It is concluded that Government and other institutions should recognize the fact that

technology and vocational education is the bedrock for any meaningful development and innovation. The problems of this form of education should be addressed to see how Technology and Vocational Education can be maximized towards productivity and sustainable development and innovation in Nigeria. It is through TVE that a nation is able to achieve a desire to become an industrialized nation. Great economies, such as China, Korea and Japan emphasized on the development and innovation of Technology and Vocational Education in their education system. High skills acquired by students of great economies form the foundation for their continuous economic development. If Nigeria is to be like other strong economies, we need to believe that TVE can do the job. We need to put more focus on TVE. We need to change the negative perceptions by our society of TVE. We need to encourage youths to enroll in TVE programme. We need employers to recognize TVE qualification. Most importantly, we need the commitment from all parties involved in the development and innovation of country's human resource by making TVE a first choice of education rather than education for the second half of high school graduates.

Recommendations

The following recommendations are made for more efficient, effective and proficient technology and vocational education in Nigeria.

1. The government, stakeholders, policy makers and Technology and Vocational Education providers in Nigeria should focus on TVE best practices that have worked in developed countries around the world.
2. Technology and vocational educators should convince the law makers on the reasons and give priority attention to the TVE programme in resources allocation.
3. The government should adequately provide fund, plan, implement, and manage TVE programmes properly in technical and conventional institutions in Nigeria.

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