Chapter 7

Information Technology, Technical Vocational Education in Developing Workforce Towards Globalization

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ABSTRACT

Industrial development of any country depends to a great extent on the level of skills its workforce possesses, and the skills and effectiveness of workforce, in turn, are dependent upon the quality of nation's education and training. Education and training are undergoing continuous change, and this poses more challenges to the workers in the 21st century and technical vocational education and training (TVET) institutions responsible for their training. Therefore, this chapter discusses relevance of information technology in transforming TVET in developing workforce towards globalization. The chapter points out clearly the meaning of workforce, meaning of TVET, and workforce development, globalization and TVET, information technology (IT), information technology and workforce development, utilization of information technology for developing workforce, impact of technology education in improving Nigerian workforce, place of information technology in transforming workforce. The chapter concludes by identifying different types of technology tools and benefits of information technology.

INTRODUCTION

From creation, man needed to satisfy three basic needs. These are food, shelter and clothing. No matter the class an individual might belong to, he must yearn for those basic needs of life. Everybody has and should have a responsibility in facilitating the satisfaction of the basic necessities of life in one way or the other. This is to say, in this context, that everybody is a worker. The quality and quantity of work done in a society depend largely on dexterity and numerical strength respectively, of such society. In the same vein, the aggregate of works and services rendered is a function of the contributions of individual

families that constitute the society. Nowadays, the needs of any society have long transcended those food, shelter and clothing. They have grown to encompass the needs for wealth, prestige, physical fitness, political independence, transportation, communication among others. The people needed to bring about the means of satisfying the above needs are knows as the society workforce. It is obvious that no one is capable of the talents, capabilities and aptitudes required to satisfy all human needs. It is therefore, becomes imperative that special training should be given to workforce to equip them with various skills required for diverse societal needs satisfaction.

Definition and Meaning of Workforce

To plan for the future, one must properly prepare and qualify the youth, equipping them with the knowledge and skills that will enable them to adapt to the rapid global changes taking place in all fields of development and knowledge. However, what distinguishes the rising and dynamic nations from the stagnant and unprogressive ones is a true commitment to this fact and a translation of it into plans, strategies, and policies that invest in the youth and prepare them to deal with the requirements of workplace. Above all, this involves looking forward to the future and trying to anticipate how it will appear. In this context, development of workforce is closely related to two important and interconnected issues. First is the issue of developing and advancing the local workforce and enabling access to the labour market by ensuring educational output meets the actual needs of the global labour market. *(*Jamal Sanad Al Suwaidi, 2018). English oxford living dictionary (2018) defines workforce as people engaged in or available for work, either in a country, area or in a particular firm or industry. It is the number of people in a country or area who are available for work.

The above definitions nonetheless, it needs to be stressed that the workforce of a nation includes all the industrial and factory workers as well as any person or group of persons in that nation whose productive work or services satisfy some aspects of human needs. The degree of satisfaction of any nation's needs determines the development of that nations. It is evident that a deliberate effort to develop various skills needed in diverse facets of the economy is necessary. This necessary will be appreciated when it is remembered that technological development demand adequate and relevant skills at all times. Workforce development is the coordination of public and private-sector policies and programs that provides individuals with the opportunity for a sustainable livelihood and helps organizations achieve exemplary goals, consistent with the societal context (Liz Jackson, 2016). Workforce development is an essential component of community economic development in any economic climate, workforce development is describe as a relatively wide range of activities, policies and programs employed by natural features to create, sustain and retain a viable workforce that can support current and future business and industry.

The International Labour Organisation (ILO) (2002) identified agricultural sector, industries, transport, communication, civil service, and education among others as sectors that need training and retraining of new and old hand respectively. This is because the old hands whose responsibility it is to train new entrants should be up-to-date in workforce development. Technical vocational education and training, it has been noted, will be effective in proportion as the instructor has had successful experience in the application of skills and knowledge to the operations and process undertakes to teach. Based on the above principle, the exigency of training for skill adjustment cannot be refuted. The contemporary worker should be systemic in ethics, in other words each worker should see himself as performing a function which must integrate with many other functions and which will ultimately aggregate to a national service. The systematic view of individual worker will helps him/herself to excel in his service and work in a fashion

that will facilitate other worker's tasks, thus maximizing the workforce output as a system. The bid to match the variety and intensity of national needs with the commensurate number and competence of trained manpower led to effort to develop the workforce.

Definition and Meaning of Technical Vocational Education and Training

Education and training are central to the achievement of economic and industrial development. Development is the ability of man to conquer his environment and utilize it to his advantage. The development of technical and vocational skills is vital to economic development for two important reasons. First, technical and vocational skills, are needed for enterprise productivity and profitability, as well as for national productivity and wealth creation. Without the necessary skills and enterprise, national growth can be seriously hobbled. Technological innovation and economic growth fuel the demand for skilled workers. The need for technical and vocational skills is increasing because of a convergence of factors-technical change, changes in work organization, growing economic openness and competitiveness, and capital deepening (increasing capital per worker). The second reason is because it is essential for individual prosperity. Acquisition of relevant skills enables the individual to increase productivity and income.

Technical Vocational Education and Training is a form of education that is planned to impart knowledge, skills (competencies), right attitude, autonomy of identity, perseverance, and character and the work ethic into learners in readiness for work and general employment. This in turn leads to productivity, social inclusion and economic development (UNESCO-UNEVOC, 2013) TVET has been found to provide central pedagogical strategies for transmitting inexperienced young people from school-life to realities of working-life. TVET is a form of the education that is didactical in nature i.e. teaching, learning and research that is oriented towards work in different trades, occupations, professionals (Meijde, 2006) in the view of Government of Bhutan Thimphu (2014)TVET is a form of education that is meant to prepare people for work in specifics trades, crafts, occupations and careers. It is a flexible, democratic and inclusive form of education, as it allows for teaching and learning to be delivered as a learner's convenience, usually through modularization, and contents for all people at levels of occupational qualifications. Modules in each curriculum are self-contained and the training are undertaken separately to ensure acquisition of skills, knowledge and attitude needed to perform the activity under employment conditions.

Technical Vocational Education and Training and Workforce Development

Training with reference to work has been described as the development of an individual's knowledge, skills, and attitudes for vocational purposes (Olabiyi & Chinedu, 2018).The training function, therefore, proceeds from the assumption that the gap between the required and actual performance-which calls for a bridge via training- is the result of inadequacy of knowledge, skill and attitudes. It is not as a result of problems arising from the state of machinery, work method and other tangible factors. Training should be provided so that the country can advance towards satisfying its workforce needs. There is much value in training people to be efficient in their jobs. By implication, a trainee is an employee or TVET student who is assigned to a prescribed training programme to fit him to perform adequately the normal operations of a specified job. The cost of not training in effect are tremendous in spite of the fact that many cannot see the effects readily (Okorie, 2000).

In Nigeria today, all efforts should be directed towards exploring means of making training a more instrument in improving work standards of the people. TVET is otherwise regarded as workforce education, facilitates the adjustment of the skills and knowledge of workforce to the changing demands of the society. It places emphasis on skill development of the individuals in a chosen occupation. Put succinctly, TVET prepares individuals for the ever-changing world of work. Effective participation in the world of work is made feasible with the adoption of adequate technology tools in TVET institutions. One major mandate of TVET institutions is manpower production for the industries. TVET institutions has an important role to play in raising the quality of work and competency of TVET graduates, increasing job satisfaction and motivating workers as well as enhancing productivity (Manifred & Jennifer, 2004).

Also, the globalisation and the rapid rate of technological changes in work places have informed the recommendation by United Nation Educational, Scientific and Cultural Organisation (UNESCO) and International Labour Organisation (ILO) (2002) that all TVET programmes in 21st century should be geared towards lifelong learning, this requires that schools in addition to academic skills inculcate workplace skills in order to increase student's flexibility and job mobility which will make them adaptable to present and envisage changes. In Nigeria, there has been emphasis in recent times on improving TVET in tertiary institutions basically for combating unemployment and poverty, as well as improvement of the economic performance globally. TVET is the heart of the economy of any nation. Just as the wheel revolves round the hub, the economic sector of Nigeria rotates round TVET. Solomon & John (2013) observed that the wealth and prosperity of a nation depends on the effective utilization of its human and material resources through industrialization industries open up possibly of greater fulfillment for the individuals.

According to Imandojemu (2001), development in TVET programme suggest training purposely planned for workforces or individuals for efficiency and effectiveness, and maximization of profit or full benefit for the industry, commerce, or agriculture. Okafor (2011) explained that TVET is concerned with qualitative technological workforce development directed towards a national pool of skilled and self-reliant workplace. The future success of nations, individuals, enterprises and communities increasingly depends on existence and possession of transferrable and renewable skills and knowledge. Many, both in the developed and developing countries recognize the important role that TVET plays in equipping individuals with relevant skills and knowledge, hence enabling people to effectively participate in social, economic and technological innovation processes. Okolocha, (2012) clarify that TVET is expected to play two fundamental roles in the national sustainable development (social, economic and environmental development) The first is to provide training opportunities and career advancement avenues for the increased school leavers, while the second is to provide skilled workforce that is needed at all levels of the economy.

TVET as a form of education for preparing citizens for working life; and is intended at developing direct expertise in the process related to technology (tools, equipment and materials) use, and skills spanning all aspects of a green trades. The major challenge that faces the country is the development of a competent workforce for sustained economic growth in the global economy. Workforce development, through coordinated education and training, will contribute significantly to promoting the interests of individuals, employers, enterprises, the economy and society within such country. A well-structured TVET system will enable productivity, enhance competitiveness and promote entrepreneurial activity (Boodhai, 2009). Therefore the purpose of TVET is to prepare nation's workforce and to serve as a medium of evolution for people in the world of work; by enabling individuals to develop a sense of belonging in their communities.

Workforce development has evolved from a problem-focused approach, addressing issues such as low-skilled workers and the need for more employees in a particular industry, to a holistic approach constituting participants' many barriers and the overall needs of the region (Meléndez, 2004). Today, workforce development often is seen as a solution to issues of social equity. Historically, it has existed in two forms: place-based strategies that attempt to address the needs of people living in a particular neighbourhood, or sector-based strategies that focus on matching workers' skills to needs in an industry already present in the region, such as healthcare or manufacturing. Some contemporary workforce development programs attempt to combine elements of both approaches, linking employment training with other government programs and community resources to provide wrap-around services. Preparing individuals for the highly digital world they are introduced to upon graduation from TVET institutions requires competencies on the use of emerging technology tools. Employees with emerging technology skills and competencies are highly demanded and are considered valuable human capital assets to companies than those who do not meet this requirement.

In response to the competitiveness problem, Nigeria must strive to develop a highly skilled, adaptable workforce that develops and uses technology. This effort would result in a renewed competitive advantage through improved technologies and innovative, creative, and highly educated workers. To make Nigerian workers compete globally, improvements must occur in the productivity of the workforce. TVET programmes has a unique role to play in improving the productivity of the future workforce. In addition to providing students with the opportunity to interact with technological systems and processes, TVET reinforces the content learned in other curricular areas and enhances higher order thinking skills. A comprehensive approach to workforce development means substantial employer engagement, deep community connections, career advancement, human service supports, industry-driven education and training, and the connective tissue of networks. Building on the lessons learned from past efforts, the new workforce paradigm contains an array of job strategies, including sector and place-based employment strategies, adult education, and short- and long-term training programs that are customized to different employer and jobseeker groups.

Concerns in Workforce Development

Achieving a better balance between the country's changing occupational employment requirement, and the qualification of the nation's workers require a nation-wide effort to provide adequate educational and training facilities far enough in advance. It will further depend on effective aid to young people in career planning and in convincing them the need for sound educational and vocational preparation for their future participation in a shifting and globalized labour market. The nation's workforce is characterised by some achievements in employment and production which have raised our national strength and levels of living to progressively greater economic heights as well as potentialities for even greater economic and social progress in years ahead. But it also involves a complex of problems which must be surmounted because of their import for the well-being of millions of people and the obstacles they could pose to future progress. The growth population will result to a very large rise in the number of people, especially young people available for employment.

To deal adequately with the problems faced by the nation's worker, both present and prospective will demand study and action on a variety of fronts by many agencies of government-federal, state and local- and by a number of private groups and individuals. Several broad interrelated areas of action which should be emphasized in current and projected programmes and in which the nation-wide co-operative

action is needed include (a) research and finding on an extremely wide range of workforce problems; (b) broad public communication of the results of this fact-finding to generate understanding and needed action; (c) strengthening of education, both general and vocational; (d) extension and improvement of training and retraining programmes; (e) improving the functioning of the labour market and increasing worker mobility; and (f) easing the impact of automation and other dislocations on workers. The success of TVET system is heavily dependent on the use of technology tools so that industry will assume ownership of the new approach to TVET and invest in it in terms of continued support and on its reliance to provide it with trained personnel (CANTA, 2005). In order to bridge this gap there is need to improve TVET institutions through use of technology tools to transform TVET graduates for sustaining workforce.

Globalisation, Information Technology and Technical Vocational Education and Training

There has been a much debate about globalization, some people believe that globalization is a dangerous phenomenon which has changed the world in negative ways. To this people, globalization has brought undesirable consequences to society, affecting its peace, while another group of people regard globalization as a fruitful phenomenon, making the world more connected and informed than ever before. Nevertheless, the concept of globalisation indicates that the various changes are somehow interrelated and creating new forms of interdependencies between actors, institutions and states. Globalisation is the integration of economies and societies through cross-country flows of information, ideas, technologies, goods, services, capital, finance and people. It is the trend towards increased economic, cultural, and social connectedness between individuals, businesses, and public organisation across international borders (Olabiyi, 2014). Globalisation has drastically transformed the world in every facet, most especially it transformed the world economy which has become increasingly inter-connected and inter-dependent. Globalisation also made the world economy increasingly competitive and more knowledge based, especially in the area of workforce development. Global technical vocational education interconnects methods of teaching from worldwide systems to encourage the international development of workforce, as well as contribution toward fortifying global industries.

These educational initiatives prioritize global access to school from the primary to the university levels, instigating learning experiences that prepare students for multinational leadership roles. As education serves as foundational to global stability, the development of multicultural awareness from an early age may integrate ideologies sourced from various societies in order to arrive at well-balanced conclusions regarding issues that surround the world as a whole. As education serves as foundational to global stability, the development of multicultural awareness from an early age may integrate ideologies sourced from various societies in order to arrive at well-balanced conclusions regarding issues that surround the world as a whole. Globalization, information technology and TVET then come to affect one another through mutual goals of preparing young people for successful future occupation during which their nations will grow increasingly connected. Globalization breaks the boundaries of space and time, using advanced information technologies, a new system of knowledge and learning should apply to a wide range of synchronous and asynchronous activities that aid TVET teacher and their student in breaking boundaries of space and time, it further meets the knowledge and learning challenges and opportunities of the Information Age.

Globalization makes it easier for businesses, creates and supports information technologists, policy makers, and TVET practitioners for the purpose of rethinking TVET programmes and supports mechanisms for the exchange of ideas and experiences in the area of workforce development, it also encourages explorations, experimentation to push the frontiers of the potential of information technologies for more effective learning and global sharing of knowledge, skills, and intellectual assets that are necessary to workforce developments at different levels. Globalisation according to Priyanka (2017) enhances the student's ability to manipulate symbols. Highly productive employment in today's economy will require the learner to constantly manipulate symbols, such as in construction, electrical, mechanical and business terms, Globalization enhances the ability of prospective workers to access, assess, adopt, and apply knowledge, to think independently to exercise appropriate judgment and to collaborate with others to make sense of new situations.

The Meaning and Concept of Technology and Information Technology

Technology is dynamic; it keeps on improving because our needs and demands for technology keep on changing. However, advancement in technology has created a new economic environment which depends on information, and that is what we call the information age. The information age provides a different work environment, and this has helped schools and businesses gain position in highly competitive markets (Karehka, 2013). The term Information refers to any communication or representation of knowledge such as facts, data or opinions in any medium or for, including textual, numerical, graphic cartographic, narrative or audiovisual forms, whereas, technology is the practical form of scientific knowledge or science of application of knowledge to practical. Consequently, information technology is computer based tool used to meet with the communication needs of individuals and organizations. It comprise computer hardware and software, network and several other devices (video, audio, photography, camera, among others) that convert information, images, sound, motion, among others into common digital form (Milken Exchange on Education Technology, 1999) Information Technology is any equipment or interconnected system or sub system of equipment that is used in the acquisition, storage manipulation, management transmission or reception of data or information (Osakwe, 2012)

Information technology tools help in providing the right people with the right information at the right time. Skill workers in an organization use information technology to complete various tasks, and these can include; transferring of information which facilitates decision making within an organization, improve customer service, among others. In this information age, it is imperative for TVET institutions to manage information systems to ensure accuracy and efficiency in preparing workforce for the nation. Technology is such an integral part of the 21st-century workplace that any occupation without some level of technical knowledge will likely fail. Technology will also open up significant new job opportunities, more education on the benefits of remote working is still required to change this mindset. Using the technology available today to enable smooth remote working is the key for a more balanced and productive workforce. With a smart, flexible approach, TVET institutions can improve job design and build trusting relationships with students and staff, leading to a healthier, happier and more effective workforce development.

Technology comes in different forms. For instance, technology is changing the way students learn and also the way teachers teach. Times change and technology is everywhere, putting this reality to the benefit of TVET is a must and the benefits from it are real. As we are moving through the 21st century, the technology is becoming more and more predominant in every field of life. The way technology has

transformed our lives is impressive. The integration of technology in TVET not only benefited the student but also facilitated the teacher in improving their teaching methodology and strategies. And these technological teaching methodology makes the students more able and competent in learning. Technology is central to many sectors of society and its integration into the education process has great promise for student learning. With technology, one can expect increased efficiency and effectiveness on both the part of teachers and students.

Information Technology and Workforce Development

In this age of globalization there is a shift in global development agenda and the Nigerian government is introducing some reforms in our educational system with a view to repositioning TVET in line with the vision of Information Technology. According to UNESCO, Information Technology is explained as a scientific, technological and engineering discipline and management technique used in handing the information, its application and association with social, economic and cultural matters. Information Technology is the science that investigates the properties and behaviour of information, the force governing the flow of information and the means of processing information for optimum accessibility and usability. The process includes the origination, collection, storage, retrieval, interpretation, dissemination and use of information. IT involves the use of hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information (voice, data, text, images) as well as related services. It is a broad term that has to do with the harnessing of process, the methods and the product of electronic communication related technologies and other related resources in today's knowledge driven society, for enhancing the productivity, the spread and efficiency of set programme activities geared towards the achievement of clearly defined goals.

Today, Information Technology have redefined the way communication is carried out in TVET institutions and further pushed the envelope with regard to the way information is disseminated, creating more channels of interaction between TVET stakeholders and the society. Studies are ongoing on how IT can be useful in developing skills in TVET institutions today. The impact IT have had in improving governance, industries, agriculture, medicine, banking and commerce, education, inter alia, so far, is being predicted to have the same impact when utilised for workforce development. Thus, IT tools like PowerPoint, e-conferencing, compact disks (CDs, VCDs and DVDs), distance learning, among others, are instruments that can facilitate skill acquisition, in TVET institutions. Through IT, the teacher-student interaction in the learning process is situated within a dynamic pedagogical context that could go beyond the four walls of a traditional classroom and laboratory. This situation predicts better days for teachers and students alike as more channels of interaction are created, thus enhancing teaching and learning. It now behooves TVET teachers and their students to take advantage of these technologies in furthering skill acquisition with workforce development through globalisation. The implication is that it enables and strengthens TVET institutions to further deploy and reinforce their commitment toward training and producing technology capable graduates that will meet the challenges of virtual workplaces. Thus, knowledge in the exploitation of technologies is critical in present-day workforce development. One of the possible means for transforming TVET to develop a sustainable workforce for the ever-dynamic world of work is to focus on the use of technology tools in the curriculum implementation process.

Utilisation of Information Technology for Developing Nigerian Workforce

TVET needs to be revitalized and transformed in order for it to become an avenue to provide effective and adequate training for individuals while imparting the necessary skills for these individuals to become self-reliant in all endeavours (FRE, 2013). TVET should also be transformed vis-à-vis the adoption of information technology tools so that it can be used to offer thorough and specialized training to individuals for employment, including self-employment (UNESCO, 2002). Around the world, gaining employment increasingly depends on a person's ability to effectively and efficiently use information technology. IT simplify and accelerate information and knowledge sharing about TVET, so that best practices and lessons learned can easily be disseminated. IT facilitate the administration of education and training, the provision of learning content, and communication between TVET trainees and between trainers and trainees. IT supports holistic learning, collaborative grouping, problem oriented activities and integrated thematic units. TVET instructors wishing to teach using information technology will be both more efficient and effective in reaching their goals (Dellit, 2002). IT is widely used in construction industries, for instance computer control numerical machine is used to control the inventory of materials in a wood workshop. IT is also used in ways that are not so easy to see.

One major example of technology in construction industries, is use of computer to design floor and roof trusses. This speed up house design and its construction, without the IT, it would take designer and drafter up to a week or more to design the kitchen cabinets for a custom-built home. With a computer, the same job can be done in less than one hour. IT increases workers ability to carry out intelligent work. Olabiyi (2014) explained further that CAD enables a person to work problems quickly-with greater accuracy. The computer extends human brain power just as a table saw extends human muscle power. CAD/CAM systems are changing the way in which homes and furniture are designed, drawn and constructs. CAD is the acronym of computer-aided design. CAM is the acronym for computer-aided manufacturing. CAD is a means of using a computer to produce a design. The cutting and pasting is done electronically.

The main advantage of using CAD as explained by John (1987) in Olabiyi (2014) is that it eliminates repetition. Once a design is created, it rarely has to be completely redrawn. The computer stores all the information. Every design can be kept in file and is always accessible. New design are created by selecting elements from existing designs and putting them together. The computer allows designers to set up a file of frequently needed design elements, parts, and symbols. This is simply referred to as up and plug them into the drawing. Using CAD, drafter can create a drawing using elements in the computer's storage unit. The efficient use of CAD systems depends on the programmes (software) that are available. For instance, an architect will use programmes dealing with designing homes, rooms, floor plans, and cabinets. A building contractor will use programmes involving bidding and scheduling. He or she may also use programmes for office functions such as payroll. CAM is the other part of the CAD/CAM system. CAM system take the design from the CAD system, using computers, numerical control machines, and robots, they produce the product in the factory.

There are computers programmes that are used for teaching, learning and development of workforce, computers are used in every stage of building houses and furniture. Here are a few examples of available programmes, these programmes are very useful to the architect and builder. A programme entitled Energy Performance Design System (EPDS) allows the architect and builder to check energy saving. An architect can check various ideas for walls, floors, ceilings, windows, doors, siding, and roofing. The programme helps the user to identify those kinds of buyer exactly how much the heating and cooling bill will be at current energy costs. A programme on truss design can be used by manufacturers of truss

systems for floors and roofs. This programme develops various truss design. It makes cutting list for the design. It does structural analysis. With a plotter attachment, it produces drawing and stock-cutting lists. A programme on cabinet designs can be used to build kitchen cabinets and fixtures for stores. The programme is useful for custom woodworking shops. Information (called in-put) must be fed into computer. This information includes the size of area and the wood to be used. It also includes the kinds of doors and drawers. In less than one hour, drawing and stock-cutting list are produced. Computers programmes for furniture manufacturing are available.

Information technologies are used in designing and making products, keeping track of inventory, and in dozens of other jobs. Information technologies are contributing to all of the manufacturing jobs. It also helped in introducing new manufacturing methods. One of these is just-in-time (JIT) manufacturing. With JIT, materials are delivered to the factory as they are needed. Warehouse space is not required. Fewer workers are needed to organise and keep track of materials, because JIT require precise planning, every stage of the operation is linked by computer. With the increasing use of technology, major changes have occurred in the way that we live our lives. We are in near constant communication with one another, and our lives are chronicled for friends and followers in real time on social media. There is need explore ways that the increasing prevalence of technology influences the way that people approach work, and how the competencies developed by digital workforce may benefit the organizations in which they work and how the increasing use of technology may influence identity development and patterns of relating within organizations. Furthermore, there is need to discuss how technology influences the way that work is structured and carried out and how jobs and organizations might be redesigned to take advantage of the competencies of workforce, to ensure effective communication and collaboration, and to leverage technology while answering its potential problems, the role of technology in our lives is constantly shifting, we are only beginning to understand the implications for how people approach work and how work could be redesigned (Colbert; Yee; & George, 2016)

Technology could be used to develop competency in workforce, interactions with technology possibly will improve various competencies in work place, and workers in the course of their interactions with technology relative to their work will enhance competencies required in carrying out their responsibilities. Among the most obvious of these competencies is their proficiency and comfort in achieving desired outcomes using technology, often referred to as technology fluency (Briggs & Makice, 2012). Technology fluency goes beyond simply knowing how to use a few programs or basic applications. Those who are technology fluent have achieved a level of proficiency that allows them to manipulate information, construct ideas, and use technology to achieve strategic goals. Just as increased technology usage has influenced the competencies, self-awareness, and relational expectations of the 21st century workforce, the way that work is structured and carried out has also been impacted by technological developments. In many ways, these developments have been positive.

Employees have a world of information at their fingertips, can collaborate with colleagues across the globe, and can deliver products with increasing capabilities at decreasing costs. For instance, digital knowledge-sharing platforms have become universal within organizations, and have become central to problem solving in multi-location, geographically. Furthermore, technology makes it possible for workforces to remain connected to work when they are at home (Perlow, 2012). Being able to respond to email from the stands of a little league baseball game can provide much-needed flexibility for employees. To be successful in our daily lives and in a global workforce, Nigerians need pathways to acquire expertise and form meaningful connections to trainees and trainers. This journey begins with a base of knowledge

and abilities that can be improved and enhanced throughout our lives. Fortunately, advances in learning have provided new understandings into how people learn and work. Technology can be a powerful tool to reinterpret learning experiences on the basis of those understandings.

Technology supports students and staff to better engage with employers, and can help students develop and showcase their employability skills. Using technology to provide real-world learning experiences can help students develop their work skills. Technologies such as wikis, simulations, games, collaboration and social media tools can all be used to develop authentic learning experiences. Furthermore, technology help students engage with employers, technologies such as social media, mobile devices and e-portfolios will help students build relationships with employers, develop their digital identities and showcase their skills. Technology develop in students lifelong learning and workforce skills. Lifelong learning skills are key employability capabilities in their own right. Developing the ability to become independent, self-regulating learners are skills that will be essential for success in any chosen path. Technologies such as e-portfolios or blogs can enable learners to gain feedback from multiple audiences, reflect on their ongoing development, and make sense of their learning.

Impact of Technology Education in Improving Productivity of Nigerian Workforce.

There are several views regarding technological advancement and its influence on the workforce (Naylor, 1985; Rumberger, 1984). One view is that technological advances will be the primary source of new jobs in the future. People read and hear about new jobs being created in the areas of robotics, computers, lasers, and optics. A common belief is that jobs in these areas are completely new and will result in job opportunities for a great many workers. The second view is that advanced technologies will vastly upgrade the skill requirements of future jobs. Advances in technology are believed to make jobs much more complex and therefore, will require higher level skills in the future. A third opinion is that the development of new technologies will result in the displacement of massive numbers of workers. The development of robotics and automated processes is viewed as a means to eliminate the human worker from the labor force. It is true that technology is having a definite effect on the nature and characteristics of the workforce. New occupations are being created while traditional occupations are being changed or eliminated. The workers that fill these changing occupations must update their knowledge and skills to remain employable.

A wider variety of skills are now needed by the workforce. The diversity of occupations has increased to the point where workers must do things that were once performed by many different individuals. Prospective Nigerian workers still need to have specific technical skills. However, employers are beginning to expect their new employees to have better basic skills. Basic skills enhance workers' abilities to learn new information and techniques and will make the future workforce more adaptable as advances in technology further changes the workplace. It is obvious that technology is having a significant influence on the workforce. However, the true nature of that influence is imprecise. TVET institutions, particularly at the senior secondary and post-secondary levels must be careful when planning to develop new programs which are oriented towards these fast growing advanced technology occupations. It is possible that many of these new jobs will be filled without the need for numerous advanced technology programs. Continued growth in enrollments may compound that problem.

Place of Information Technology in Transforming Workforce Development

Teaching in classroom and workshop is no longer conceptualized in the narrow sense as merely a matter of the teacher addressing a class. In more comprehensive approach, it is the outcome or aggregate of a number of inter-related activities. Information technology is basic and indispensable in the teaching and learning of TVET programmes and in fact, in all facets of human resources development, information technology has become a veritable tool being used to solve TVET related problems ranging from design of article to sale of products in many parts of the world. The inter-relationship between TVET and information technology development and advancement of humans shows the importance of TVET in life due to its relevance in technology world. For TVET to reap the full benefits of information technology in learning, it is essential that students and teachers are able to effectively use these new tools for learning. Technology tools are keys in the provision of TVET. Technology tools facilitate the implementation of TVET, the provision of learning content, and communication between teachers and learners

Use of Information Technology tools in the training, up-grading and re-training of workers is of paramount significance and an essential aspect of teaching's cultural toolkit in the twenty first century, affording new and transformative models of development (Leach, 2005). Effective utilization of IT tools eases the expansion and reinforcement of TVET by enhancing networking and knowledge sharing opportunities and would extremely curtail the supply of mechanically operated training hardware, thereby offering students individualize learning even after school hours. Furthermore, IT tools in TVET programmes have the capability to make available practical learning experiences that are needed to the instantaneous work situations.

The nature of the work at the work places is becoming more and more digitally based and multilateral in nature. The skills required in workplaces are therefore becoming wider and more complex, with the composition of both technical and non-technical competencies (Kim & Park, 2009). It is pertinent by the implication of the afore reference for TVET institutions to acknowledge the reality that information age necessitates, and to device a confrontation mechanism that will guarantee the trainee's skills move in the direction and nature of employment in a changing world of work. Industrial automation and control, e-commerce, e-government, fiber optics, cellular technology, solar vehicles, among others, and a work which time and space is no longer a factor has increased the demand on the level of IT skills required from a graduate of TVET, which in turn ask for more input to the process of human resources development, thereby, full utilization of IT tools is required in TVET institutions.

Information Technology creates new opportunities for teaching and learning, it helps to shift the emphasis in learning environments from teacher-centered to learner-centered; where teachers' roles has change from being the key source of information and transmitter of knowledge to becoming guides for students' learning; and where the role of students changes from one of passively receiving information to being actively involved in their own learning (United Nation Educational Scientific and Cultural Organization, (UNESCO, 2005) Therefore, Information Technology is the use of computer and telecommunication facilities to store and retrieve information from various sources, generate and transfer ideas, and also impart knowledge to recipients. In views of the meaning of IT as described above, it could be concluded that in order to prepare students for that kind of workforce, complete internet and intranet services should be made available in TVET institutions.

Development in Information Technology has brought new teaching and learning opportunities to teachers and students. IT has been found to encourage active learning, support innovative teaching, reduce the isolation of teachers, and encourage teachers and students to become active researchers and

learners (Yusuf, 2007). Additionally, IT supports holistic learning, collaborative grouping, problem-oriented activities and integrated thematic units. Teachers wishing to teach in this way will be both more efficient and effective if they employ IT to reach their goals (Dellit, 2002). Cavas, et al., (2009) suggested that there are five important reasons for teachers to use IT in education: (i) motivation, (ii) distinctive instructional abilities, (iii) higher productivity of teachers, (iv) essential skills for the Information Age, and (v) support for new teaching techniques. IT has the capacity to affect the efficiency and productivity of TVET teacher education programme. Within this context, UNESCO (2002) has noted that teacher education institutions need to develop strategies and plans to enhance the teaching-learning process within TVET programmes and assure that all future TVET are well prepared to use the new technology tools for learning.

Transforming Nigerian Workforce Development Programmes through New Technologies

Technology assisted instructional learning provide ample opportunities for students to broaden their learning skills and for teachers to develop better multimedia and interactive courseware. Also, technology competency is one skill that will be needed in all professions so working along with technology is a good way to make the learner work ready along with all the needed skills. Integration of technology into vocational instruction can provide schools with potential access to the world of work outside of the school and allows teachers to design useful learning environments that emphasize learning in the context of real world activities for vocational students. Teachers' perceptions are very important to the success or failure of integrating technology into instruction, and they play a significant role in this process. Teacher has been the change agent and plays a critical role in the success of teaching and learning in vocational programs. Vocational teachers should model the appropriate uses of technology in the workshop and classroom to help equipping their students with the necessary knowledge and skills to use these tools effectively in their working life. To ensure technical and vocational programs are relevant to the society, vocational teachers must be able to use these new technologies that are continually changing the ways how people live, work, and learn.

Therefore, vocational teacher should keep pace with changing technology in order to assure their roles still relevant to produce tomorrows' labor. Because their competency in information technology is essential if they are to be successful instructional leaders as they transfer this competency to their students. Rapid advances in technology have transformed the workplace and changed the way individuals learn by impacting the interpersonal communication and collaboration. Many TVET institutions have started employing different technologies into their learning and workforce development programmes, using these tools to cut training costs, reduce carbon footprint, and increase continual learning outside the classroom. Below are examples of newer technologies that organizations have incorporated into their workforce development programmes.

Web-conferencing: this method allow trainers to conduct live meetings, trainings, and presentations via the Internet with their trainees. Web-conferences allow participants opportunities to ask questions and participate in polls. Common examples of web-conferencing tools are Webex, Adobe Connect, Goto Meeting and Live Meeting

Social Network/ Community of Practice: this is an online method where group of people who develop friendships, find professional connections, share interests, and gather knowledge and information. These communities are formed online through social sites. Workforce development programmes can utilise

social network to link course participants before and after a training event to share knowledge and ideas regarding the course. Trainers and trainees provide links to articles, webinars, and on-the-job examples before, during, and after training event.

Blog: blog is a website which permits an author to share opinions, reflections, and discuss relevant topics in the form of online journals. TVET institutions can incorporate blogs to provide supplemental course information and updates on course materials to learning and workforce development programmes. Participants can discuss issues on workforce development in this space.

Integrated Collaboration Environment or Collaborative Workspace: this is a virtual environment where groups may work on projects and share material. Project teams can access a shared workstation where they upload files and share them with one another. Some of the examples of integrated collaboration environment or collaborative workspace are SharePoint, Google Apps, Google Docs, Zoho and Moodle. Through this technology individuals may also establish shared spaces to learn from one another either formally or informally. For example, individuals from different TVET institutions involved in training and workforce development may create a workstation to share ideas, experiences, and resources to develop a supervisory training program.

Wiki: Wiki is a website tool that allowing users to create and edit content on any number of inter-linked web pages via a web browser. This method is used in learning and development of workforce programmes to promote collaborative learning and information sharing. Trainers and trainees use wikis to create reading lists. Programme participants use wikis to for team projects. TVET institutions use wikis to post internal processes, publish reference guides, and capture best practices.

*Social Bookmarks***:** Social bookmark i**s** a system allowing workers to collect and store bookmarks online, tag with key words and share those bookmarks and tags with others. This type of tool allows course instructors develop course reading lists. Course participants supplement course material by sub-scribing to a particular tag or keyword that relates to the program.

Media Sharing: media sharing is an online environment which allows workers to search for photos, videos and/or other media for uses in (among others) presentations, learning materials and coursework. Users publish content to a larger audience. Trainers can record workshops and upload them to an online social network. Some of the examples of media sharing tools are Flickr, Google+, and YouTube.

Virtual World: is a simulated environment where users can interact with one another and create objects through an onscreen avatar. This type of environment allows program participants to attend live workshops and conferences in a virtual classroom or conference space. Participants are able to interact with each other in much the same way as attending a real workshop or conference. Course project teams can meet and collaborate in a virtual space. Institutions have developed courses using a virtual environment to conduct simulations of various situations.

Instructional Tools: is a software packages instructional designers use to create and package content to end users. Instructional tools are generally used to create e-learning modules. They are written to conform to international standards such as Shareable Content Object Reference Model (SCORM). These tools allow for Common instructional tools are Adobe Captivate, Adobe Flash, and Articulate.

Satellite Communication: technical vocational educators can easily reach their students through satel-lite residing in any geographical area of the world. It has made it possible to open a channel exclusively for technical vocational education. Such type of system have been introduced in India by imparting les-sons on T.V. and Radio by different agencies and educational institutions like UGC, NIOS, and IGNOU among others.

Benefits of Information Technology to TVET in Global Context

There are certain benefits of Information Technology to technical vocational education and training programmes in global context, which makes TVET educator more efficient and skilled. Some of these are as follows:

1. information technology helps in couture resources to meet the student needs,
2. it helps in setting of assignments on-line, in viewing the work submitted by the students and in giving the instant feedback
3. it helps to initiate discussion about topics,
4. it helps in providing resources on-line, such as documents, presentations and data or in giving direct links to website, which are linked to the topic of study, and
5. the internet increases access to authentic data, and simulations enable teachers to show experiments that would not otherwise be possible

SUMMARY

Workforce has been defined as people engaged in or available for work, either in a country or in a particular firm or industry. It is the number of people in a country who are available for work. TVET refer to a form of education that is planned to impart knowledge, skills, right attitude, autonomy of identity, perseverance, and character and the work ethic into learners in readiness for work and general employment. This in turn leads to productivity, social inclusion and economic development. Information Technology is seen as an electronic device for managing and processing information with the use of soft and hard wares to convert, store, manipulate, protect, transmit, manage, control and retrieve information for the enhancement and productivity of personal and organizational activities. Globalization enhances the ability of prospective workers to access, assess, adopt, and apply knowledge, to think independently to exercise appropriate judgment and to collaborate with others to make sense of new situations. A quality TVET programme plays an essential role in stimulating workforce development and contributing to poverty reduction as well as ensuring the social and economic inclusion of marginalized communities. Around the world, gaining employment increasingly depends on a person's ability to effectively and efficiently use information technology (IT), as information technology simplify and accelerate information and knowledge sharing about TVET, so that best practices and lessons learned can easily be disseminated and technology tools facilitate the implementation of TVET, the provision of learning content, and communication between teachers and learners. TVET institutions need to provide information technology tools for teaching and learning, and develop strategies and plans to enhance the teaching-learning process within TVET programmes and assures that all TVET students are well prepared to use the new technology tools for learning. Using technology tools reduce training costs, and increase continual learning outside the classroom, examples of newer technologies that TVET institutions can incorporated into their workforce development programmes include are Web 2.0 tools, which allow learners to share knowledge and best practices in a wiki, blog, or discussion forum, and form networks through social network sites. Instead of just reading static material, users of Web 2.0 tools have the opportunity to create and modify content directly onto these pages. Therefore, this age of highly sophisticated knowledge has great impact on TVET programmes. Like all other professions, TVET programmes is also highly influenced by the globalization.

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