RECONFIGURING TECHNICAL AND VOCATIONAL TRAINING FOR INNOVATIVE LITERACY IN THE FACE OF DIGITALIZATION

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Abstract

Education quality a nation offers determines the level of her progression. This study examined reconfiguring technical and vocational training for innovative literacy in the face of digitalization. This study reviewed past literature and discussed the concepts of technical and vocational training, innovative literacy and digitalization. The study concluded that the situation of technical and vocational training in Nigeria is antiquated without current issues and educational innovations that have the potential to increase cognitive and analytical skills as well as creativity and autonomous learning. Hence the need for policies that will propel the digitalization of technical and vocational training for innovative literacy, without which, the skill gap and quality of technical and vocational graduates can better be imagined.It was recommended that the review and development of policies supporting technical and vocational training is inevitable. This will improve technical and vocational training delivery through ICT integration for innovative literacy where applicable

Key words: **Technical and Vocational Training; Innovative Literacy and Digitalization**

Introduction

Technical and vocational training is the form of education that places emphasis on pragmatic attitude as a priority (for individual and community development). Technical and vocational training advocates development of the head (knowledge), training of the hand (dexterity) and enriching the heart (conscientiousness). It is a total deviation from the previous emphasis on reading, writing and arithmetic, which was fundamentally a form of credentializing entry into elite status with its graduates roaming about seeking for the non-existing white collar jobs (Okoye & Okwelle, 2013).

Harnessing the potentials of technical and vocational training for socio-economic and technological emancipation has been in the front burner of many emerging nations. Thus, from global perspective, arguments, claims and counterclaims over the capability of technical and vocational training in fostering brighter future and sustainable economy has been laid to rest. However, studies have it that many technologically advanced nations of the world realized their potentials and maintained firm footings through adaptation and practice of technical and vocational training (Ogbuanya, & Okoye, 2015). This implies that technological advancement of any nation depends hugely on its ability to transform its resources into practical reality, which guarantees its self-sustenance and viability.

However, technical and vocational training has not live up to its expectation in terms of achieving its goals. This development could be as a result of not implementing a workable mode of delivery for technical and vocational training programmes. Majumdar and Araiztegui (2020) argue that remote learning has further challenged the very core of technical and vocational training assessment and laid bare its weaknesses. This therefore informs the need for innovative approach to technical and vocational training through digitalization.

Machekhina (2017) defines digitalization as the transformation of all information types (text, sound, visuals, video and other data from various sources) into the digital language. It is the change associated with the application of digital technology in all aspects of human society. The effective digitalization of technical and vocational training will facilitated the realization of the stated objectives of the programme by improving innovativeness, curiosity and creativity of the learner. In technical and vocational training, there is a need for innovative responses in teaching, learning and organisation, and for the effective deployment of digital technologies to build the flexible, high quality TVET systems that can deliver the skills we need socially, environmentally and economically.

Despite its proven contribution, Nigeria does not seem to give technical and vocational training, the attention it deserves; and that appears to be one of the reasons for the rising unemployment and poverty in the society ((Ndelekwute, 2017). Adeoye et al. (2020) reports that most public technical and vocational training institutions in

Nigeria have not been able to embrace digitalization to the detriment of their students and the society at large. Various factors might be responsible for this, such as inadequate funding for developing innovative practices in technical and vocational training, resistance to change teaching methods and pedagogical practices, the lack of access to new pedagogical equipment and digital technologies, and the lack of a shared vision or strategy on innovation in technical and vocational training. Ali (2019) argues that technical and vocational training institutions in Nigeria have suffered the problem of inadequate funding. It has also suffered the problem of insufficient supply of and perhaps non-functional infrastructure and less competent human resources to impart the necessary skills to the learners. Technical and vocational training is therefore the missing link in Nigeria's development policy hence the need to reconfigure and strengthen it for purposeful goal orientation.

Concept of Technical and Vocational Training

The universal justification for Technical and Vocational Education and Training (TVET) has been to provide occupational skills for employment. However, this keeps changing and TVET has been assuming different meanings and purposes due to global demographic, social, technological, economic and political developments. Many even in the academia have tried to classify this system of education under the banner: vocational education, technical education, vocational and technical education, technical and vocational education and training.

The United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2009) views (TVET) as learning, aimed at developing skills in the practice of certain trades, as well as learning, aimed at preparing students for entry into the labour market in general. The organization maintained that in both cases, learning may be geared towards direct access to the labour market or lay the foundation for access to higher education and training with joining specific trades in view. Technical and vocational training is this sense, encompasses programmes that provide participants with skills, knowledge and aptitudes that enable them to engage in productive work, adapt to rapidly changing labour markets and economies, and participate as responsible citizens in their respective societies.

Okorocha in Bolupe et al. (2021) perceives technical and vocational training as an educational training which encompasses knowledge, skills, competences, structural activities, abilities, capacities and all other structural experiences for securing jobs in various sector of the economy or even enabling one to be self-dependent by being a job creator. It is a specialised education designed to empower learners through the development of their technical skills, human abilities, cognitive understanding, attitudes and work habits in order to prepare learners adequately for the world of work or position them practically for self-employment after graduation. Oyemuga et al. (2014) define technical and vocational training as that part of the total experience of individuals, whereby he or she learns successfully for the purpose of gainful employment since it deals with the development of skills, knowledge, abilities, competencies, attitudes and capabilities that are required for success in any specific/useful occupation or career.

This implies that technical and vocational training has the potential of enhancing human resource development, productivity and economic development of a nation. Therefore, an individual who acquires those competencies and some psychomotor skills in technical and vocational training is already empowered to be self-reliant. Such individual has greater opportunities to earn a livelihood as well contribute to national development. Hence, technical and vocational training is designed to offer training to improve individual's general proficiency in relation to their occupations.

Meaning of Innovative Literacy

Innovation is a technology-related phenomenon with product and process dimensions. Product and process in education are concerned with developing learning environments that help students build 21st century skills to become flexible, self-directed, social, productive, and responsible (Niyazi et al., 2013). Innovativeness reflects an individual's or an organisation's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes (Taylor, 2017). This perspective implies that evidence of innovativeness may take several forms. In the broadest sense, innovativeness may occur along a continuum from a simple willingness to either try something (for example a new product) or experiment with it, to a passionate commitment to master the latest in new products or technological advances.

Literacy is being re-defined by the presence of digital technology in schools and the society. No longer does literacy mean only the ability to read with comprehension and write with clarity. Literacy in contemporary society means being active, critical and creative users of information. It means being able to use an array of technologies to gather information and communicate with others. In a digital environment, literacy is the ability to use state-of-the-art tools to achieve goals, involving the confident and critical use of digital technologies for work, education, leisure and communication (Alexander et al., 2016).

Henriksen et al. (2016) define innovative literacy as a large variety of complex cognitive, motor, sociological and emotional skills, which users need in order to function effectively in digital environments. Amila et al. (2021) view innovative literacy as a "combination of technical-procedural, cognitive and emotional-social skills." It encourages teachers and students to explore, research and use all the tools at their disposal to uncover something new. It involves a different way of looking at problems and solving them. The thinking process that goes into it will help students develop their creativity and their problem solving skills. The five competence areas of innovative literacy are information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving (Grant-Clement, 2017).

Therefore, to be literate in the twenty first century means to be literate in a multitude of ways. An individual must not only know how to read and write, print texts but also have the skills, understanding and be open-minded to innovation. Innovation is key in this context. It is the creative process whereby new or improved ideas are successfully developed and applied to produce outcomes that are practical and of value (Taylor, 2017).

Concept of Digitalization

According to Hellsten and Paunu (2020) digitalization means to create and execute "changes associated with the application of digital technology in all aspects of human society". It can be considered in a common sense that digitalization means the integration of digital technologies into everyday life at processes, educational, organizational, business and other society domains.

'Digitization' and 'digitalization' are two conceptual terms that are closely associated and often used interchangeably in a broad range of literatures. According to Narula and Rana (2017), digitization refers to 'the action or process of digitizing; the conversion of analogue data (esp. in later use images, video, and text) into digital form.' Digitalization, by contrast, refers to 'the adoption or increase in use of digital or computer technology by an organization, industry, or country.' This distinction between the two concepts is necessary because their usefulness and effects differ. Depending on what we aim to achieve, we will resort to the implementation of one of the two processes, either digitization or digitalization. The correct understanding of the two processes is necessary for the general public knowledge but especially for those who are going to be involved in such a transformation that involves the innovations in the digital domain.

The expression 'digitalization' or 'digital transformation' refers to changes associated with the application of digital technology in all aspects of human society (Bloomberg, 2018). Brennen and Kreiss (2014) see digital transformation as changes in ways of working, roles, and business offering caused by adoption of digital technologies in an organization, or in the operation environment of the organization.

Today, more than ever, the efficient use of digital technologies and learning resources in education and training is considered a key factor in achieving the educational objectives. The role of digital technologies and resources is to improve and add more value to the learning and teaching processes. To this end, teachers and students can access an increasing number of digital technologies and resources and use collaborative platforms to improve teaching and learning practices.

Technological Developments impacting the Digitalization of Technical and Vocational Training

The development of new digital technologies (digital innovation) creates new capabilities for education, the workplace and societies in general. Thesecapabilities lead to new skills that enable persons to adapt to and benefit from these transformations(digital adaptation), as well as transformations in the nature of education, work and society (digital acceleration).

Okiridu and Ogwunte (2018) outline some of the technologies driving digitization and digital transformation of TVET to include cable satellite broadcast, internet and web browsing, e-library, e-mail and fax, e-sound books, e-trackers, personal computer, laptops etc. These technologies facilitate Remote learning, Distance learning, Virtual learning, Blended learning, Mobile learning, Distributed learning, Machine learning, Ubiquitous learning, Deep learning, Cooperative and Collaborative learning. Most aspect of education is going digital, and technical and vocational training stakeholders including students are confronted with the challenge of transition to digitalization (Edeh et al., 2020).

Grech and Camilleri (2017) observe that learners can learn individually or collaboratively through a multitude of technology-enabled methodologies, including writing activities, game-like learning environments and simulations. The combination of school and work-based actors (teachers and supervisors) and actions (intertwining learning

activities at both locations) are what make technical and vocational training unique. However, current research and practice often neglects the possibilities of investigating the role of collaboration in technical and vocational training, where the interaction between people in different locations is fundamental to the systems' effective functioning (Nwosu & Okoro, 2019). Given these limitations, six areas of learning hold promise for technical and vocational training: distance learning and assessment, simulation, flipped classrooms, gamification, open education (resources) and personalization.

These digital technologies have potentials for innovative literacy and development of future skills in technical and vocational training in the following areas:

i. Technical skill include: IT knowledge and abilities, data and information processing and analytics, statistical knowledge, organizational and processual understanding, ability to interact with modern interfaces. Others are knowledge management, interdisciplinary/generic knowledge about technologies & organizations and awareness for IT security and data protection.

ii. Personal skill include: Self and time management, adaptability/ability to change, team work abilities, social skills and communication skills. Others are trust in new technologies, continuous improvement and lifelong learning.

Strategies for Reconfiguring Technical and Vocational Training for Innovative Literacy in the Face of Digitalization

To transform technical and vocational training in the current face of adversity and achieve meaningful growth in Nigeria, a re-restructuring work needs to be done. This paper identifies the following as worthy strategies:

Innovativeness: Innovativeness reflects an individual's or an organisation's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes (Taylor, 2017). This perspective implies that evidence of innovativeness may take several forms. In the broadest sense, innovativeness may occur along a continuum from a simple willingness to either try something (for example a new product) or experiment with it, to a passionate commitment to master the latest in new products or technological advances. Hence, the need to repackage technical and vocational training curriculum and programmes alongside the global trends in technological breakthroughs that is characterize by digitalisation. Such attempt will streamline and integrate digitally mediated learning and other digitalized approaches into the instructional contents of technical and vocational training as well as its delivery pedagogies. In line with the foregoing, Nigeria can realized the goals and objectives of technical and vocational training by not only integrating digital technology into the schemes but also observe strictly every terms as pertains to policy implementation and best practices.

Optimization of digital and entrepreneurship skills acquisition by technical and vocational training Teachers: Training and retraining of technical and vocational teachers in various aspects of lifelong learning is quite imperative in rebuilding technical and vocational training in order to realize its goals and objectives. The increasing changes in socio-economic and technological advances demand an urgent response which makes it imperative that technical and vocational teachers be encouraged to undertake some in-service training in the areas of technologies and entrepreneurship. Bond (2020) argues that restructuring TVET requires teachers to seek out relevant knowledge and skills acquisition to sharpen and broaden their expertise and need for provision of reliable and affordable resources for access to the internet, and for technical and pedagogical support to teachers and students in the education system. Retraining teacher will enhance their propensity in content mastery and instructional delivery in order to meet the yeaning needs for successful enterprising and industrial standards. To buttress this, UNESCO (2009) recommendation for TVET states that the lifelong learning should include:

i. Continuous review and updating of knowledge, competencies and skills;
ii. Continuous updating of specialized professional skills and knowledge, and
iii. Periodic work experience in relevant occupational sector.

Provision of adequate and functional digital tools and equipment: Available statistics revealed that our workshops and laboratories not only suffer inadequacy of facilities but fraught with obsolete and dysfunctional equipment. Sometimes, even when fund is committed for the purchase of these facilities, substandard and moribund equipment are purchased with the aim of enriching individuals' pockets at the expense of the future of entire Nigerians. Provision and training of students with modern tools would enrich the quality of technical and vocational training programmes as well as transform the educational sector technologically.

Public-Private Partnership: Public-private partnership involves contractual agreements between public sector authorities and private entities. Whereby the private party provides or delivers a service that should have under normal circumstances been provided by public sector and assumes substantial financial, technical and operational risk in the process of service delivery (Ogbuanya & Okoye, 2015). This strategy is effective in strengthening technical and vocational teacher education, facilitating their professional development as well as providing opportunities for both teachers and students to have industrial experience. In addition, it would enable teachers to have access to the latest technology and practices and also enable technical and vocational institutions to know the level and types of skills currently required. Moreover, an effective collaboration between public technical and vocational training institutions and private sector industries will ensure that technical and vocational training curricula and teaching methodologies are up to date and relevant to the needs of the industry.

Dichotomisation of technical and vocational training: Technical and vocational training institutions should be organized outside the direction of general education, while the curriculum be tailored to meet the employability skill demands of relevant specialties and industries. This is because the goals of technical and vocational training differ reasonably from the goals of general education. A situation where those from general education (science, curriculum, social science etc.) are posted to head vocational and technical education is not a good development. Records abound in this country that such technical and vocational training institutions die natural death or they are completely stunted in growths, loss focus and converted to general education programs. This is always as a result of mal-administration and complete lack of understanding of how technical and vocational training programs are managed (Atsumbe et al., 2012).

Professionalization of technical and vocational training: Nigeria needs to improve the status and attractiveness of technical and vocational training by professionalizing it. Flexible and workable policies on technical and vocational training and proper recruitment pattern should be put in place, to increase skills levels, provide better access to and delivery of learning for all (Okolocha, 2012). Government at all levels should try to create an enabling environment for technical and vocational training as an integral part of government policies on youth and adult self-dependent.

Mbah et al., (2020) opine that restructuring technical and vocational training programme requires the intervention of the institution's administrators and that of the government. Some of the identified institution administrative strategies include developing quality training programme for students skill development, partnering with relevant authority on improving skill acquisition, promotion of healthy training environment, maintenance of facilities used in skill acquisition programme, supervision of teachers in their various areas, regular evaluation of programme effectiveness and improved curriculum in order to achieve quality educational programme. The government strategies on the other hand include provision of skill acquisition training facilities, employment of qualified vocational educators in respective skills, regular payment of staff, making appropriate regulations in respect to skill acquisition, retraining of staff for quality in delivery, provision of improved teaching aids for ICT related skills among others (Bolupe et al., 2021).

Challenges Affecting Technical and Vocational Training in Nigeria

Whilst, the United Nations Educational, Scientific and Cultural Organization (UNESCO) reports that revitalizing TVET is among the ways to improve economic opportunities for the youths. It should be noted that no education reform will work in an environment constrained by corruption, lack of infrastructure, electricity, incentives and policies that can promote private sector development. Mbah et al. (2020) report that technical and vocational training is underfunded, the basic infrastructures needed to facilitate teaching and learning is lacking in most institutions offering programmes in technical and vocational training, there is the problem of obsolete, inadequate and in some cases lack of machines, equipment and facilities. These facilities are in some cases housed in dilapidated buildings packed with junks. The prevailing curriculum on technical and vocational training is antiquated without current issues, there is acute shortage of experience technology instructors in the country and most of the few available do not poses the necessary skills for practical activities, there is neither retraining scheme to keep teachers of technology abreast of the rapidly changing labour market nor do institutions offering technical and vocational education conduct production-based activities where technical and vocational teachers could undertake the practical orientation on research and development (Albert, 2018).

Similarly, Ali (2019) discusses the challenges affecting the transition to innovative literacy in technical and vocational training to include the digital divide which is still widely evident in the country due to the paucity of ICT infrastructure, low access to high quality ICT services, digital illiteracy and problems of capacity development. Series of studies conducted by various researchers revealed that schools do not adequately embrace the acquisition and utilization of digital instructional technologies in technical and vocational training institutions (Ido & Asuquo, 2014;

Ojo & Akhademe, 2016). They are faced with the problem of inadequate or non-functional computer laboratories, computer systems, computer peripheral devices and modern teaching aids. Added to the problems of inadequate facilities is the problem of poor funding of education and lack of skills and inexperience on the part of the teachers. Others are limited access to the internet and broadband services, technological cost and obsolence, and lack of clear policy standard by government to guide digitalization of education in terms of quality control, content or resource development and delivery.

Conclusion

In technical and vocational training, there is a need for innovative responses in teaching, learning and organisation, and for the effective deployment of digital technologies to build the flexible, high quality technical and vocational training systems that can deliver the skills we need socially, environmentally and economically. Unfortunately, the situation of technical and vocational training in Nigeria is antiquated without current issues and educational innovations that have the potential to increase cognitive and analytical skills as well as creativity and autonomous learning. This therefore informs the need for government and other stakeholders in technical and vocational training to be committed to the implementation of policies that will propel the digitalization of technical and vocational training for innovative literacy, without which the skill gap and quality of technical and vocational graduates can better be imagined.

Recommendations

Based on the foregoing discussion, the following recommendations are made:

1. The review and development of policies supporting technical and vocational training is inevitable. This will improve technical and vocational training delivery through ICT integration for innovative literacy where applicable and also improve investment for the provision of adequate infrastructure, digital equipment facilities, training and retraining, workshop/laboratories, consumable materials, electricity and broadband internet.
2. Advocacy, vision building and sensitization on the real essence of technical and vocational training is critical. This measure when properly carried out would fast-track attitudinal change and elicit positive commitment from proprietors, teachers, parents, student and all other stakeholders in the country.
3. There is need to develop and implement competency frameworks for technical and vocational teachers and to also support continuing professional development of the teachers and trainers. This will facilitate job related up-skilling or re-skilling of teachers and also address the problem of skill misalignments and shortfalls.
4. Technical and vocational training institutions should promote partnerships in the public and private sectors that provide on-the-job learning experiences to connect learners to entry-level work. Such exchange arrangements often bridge the gaps between theory and practice as well as acquaint the trainers and trainees of technical and vocational training institutions with the present needs and expectation in the industry.

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