Appraisal of Digitization of Technical and Vocational Education and Training (TVET) and Skills Systems in Nigeria

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Abstract

The Nigerian skills system requires urgent reforms as skills mismatch is prevalent and the disparity between skills demand and skills supply is growing. There is a wide disconnect between theory and practice, such that it becomes difficult to apply what is taught, to real-world issues. Consequently, this has tended to increase the unemployment rate in Nigeria. Digitization of technical and vocational education and training (TVET) is restructuring skills development and requirement for current occupation. This paper aims to appraise how the digitization of technical and vocational education and training (TVET) will improve skills systems in Nigeria. The paper identifies the concepts and relationships between three key background issues: *digitization, technical and vocational education and training (TVET), and the Nigerian skills system. The paper adopts a comprehensive literature evaluation and case studies on existing research on technical and vocational education and training (*TVET), *unemployability, and digitization. The paper proposes and recommends structures and roadmaps for restructuring the skills system in Nigeria.*

Keywords: Competency, Digitization, Skills, TVET, Unemployability.

Introduction

As the world of work becomes more digital, new demands are placed on skilled workers. The digital revolution has resulted in massive shifts in the skill sets required for work and life. TVET and digitization are linked to changes and challenges in work procedures as well as developments toward the fourth industrial revolution. To take these developments into account and support the adaptation processes, technical and vocational education and training (TVET) institutions must offer selected training activities for different target groups in the areas of "Digital Teaching and Learning in TVET" and TVET in the context of "Digitization Fourth Industrial Revolution." Technical and vocational education and training (TVET) is regarded as a critical component of educational systems, particularly for its role in developing the human resources required for economic growth. (UNEVOC, 2016)

Details from the Nigerian Bureau of Statistics explain that 33.3% or 23.2 million of about 70 million people who should be working in Nigeria are out of work when an acceptable level of unemployment should be 4%-6%. It further explains that the country's underemployment rate, that is people who work less than 20 hours a week is also high at 22.8%. One of the major causes of unemployment in Nigeria is the disconnect between required skills and available jobs. Finding innovative ways to solve these emerging problems is imperative to restructuring skills requirements for current occupations *in Nigeria through practical integration of* digitization *with* technical and vocational education and training (TVET).

Literature Review

TVET encompasses a wide range of skill-development opportunities tailored to national and local contexts. Learning to learn, literacy and numeracy development, transversal skills, and citizenship skills are all essential components of TVET (UNESCO, 2015). TVET refers to training in public and private educational establishments or other forms of formal or informal instruction aimed at providing all segments of society with access to lifelong learning resources.

Technical and vocational education and training (TVET) is defined by UNESCO and the International Labor Organization (ILO) (2001) as aspects of the educational process that include, in addition to general education, the study of technologies and related sciences, as well as the acquisition of knowledge, practical skills, and attitudes relating to jobs in various sectors of economic and social life (ILO & UNESCO, 2001)

According to Hirschi, (2018), the fourth industrial revolution that began to be known in 2011 in Germany had a significant influence on several aspects of the world. One result is the digitization and automation of work, this has an important influence on economic growth, business, social life, and the world of work. There will be many significant changes to the need for the world of work and industry. These changes might lead to changes in many current occupations. TVET ranks among the fields that may be drastically affected by the fourth industrial revolution.

Technical and Vocational Education and Training (TVET) serves multiple purposes. A key purpose is the preparation of youth for work. This takes the form of learning and developing work-related skills and mastery of underlying knowledge and scientific principles. Work is broadly defined and therefore refers to both formal and self-employment. To support self-employment, TVET curricula often include entrepreneurship training. The social reproduction and transformation of occupational and vocational practices are related to this. A related role is continuing professional development. The rapid technological changes demand that workers

continuously update their knowledge and skills. Unlike in the past where a job could be held for life, it is commonplace to change vocations several times.

According to the National Bureau of Statistics, NBS Nigeria (March 2021), the unemployment rate in Nigeria rose from 27.1 percent to 33.3 percent from December 2020 to March 2021. Nigeria's unemployment has affected the youth and the country's economic growth from a broad spectrum of socio-econ perspectives. Unemployment among graduates impedes Nigeria's progress in several sectors. It also constitutes political unrest in the country (Ipaye, 1998). According to Ezie (2012), the unemployment situation in Nigeria is disturbing and even more disheartening that the country's economic condition cannot absorb an optimal proportion of its labour force. This condition has contributed to the upsurge in crimes and other social vices experienced in our society in recent times. As a result, Nigerian skills system development calls for restructuring and transformation.

Unemployability and Employability in Nigeria

According to Forrier and Sels (2003), unemployability is a situation when job seekers do not possess the current skills demanded and needed in the labour market. Employability refers to a worker's ability to obtain and retain a job (Rothwell & Arnold, 2007). Employability encompasses personal initiative Fay and Frese (2001) and functional flexibility Beechey & Perkins (1987) and is characterized as the ability to achieve career mobility through one's know-how, skills, knowledge of the labor market, and adaptability, in general (De Cuyper, Rigotti, De Witte, & Mohr, 2008). The results of employability are as follows:

i. a solid foundation of key skills, educational opportunities, the availability of training programs, motivation, capacity, and support to utilize chances for continuous learning.
ii. Recognizing obtained skill sets is critical for facilitating workers to obtain decent employment, managing change, and allowing businesses to embrace innovative technologies and expand their market share.
iii. There is a need to promote skills development in economic sectors with high job creation potential for young people and expand educational opportunities at all levels and ensure that graduates are equipped with skills and competencies sought after by the labour market.

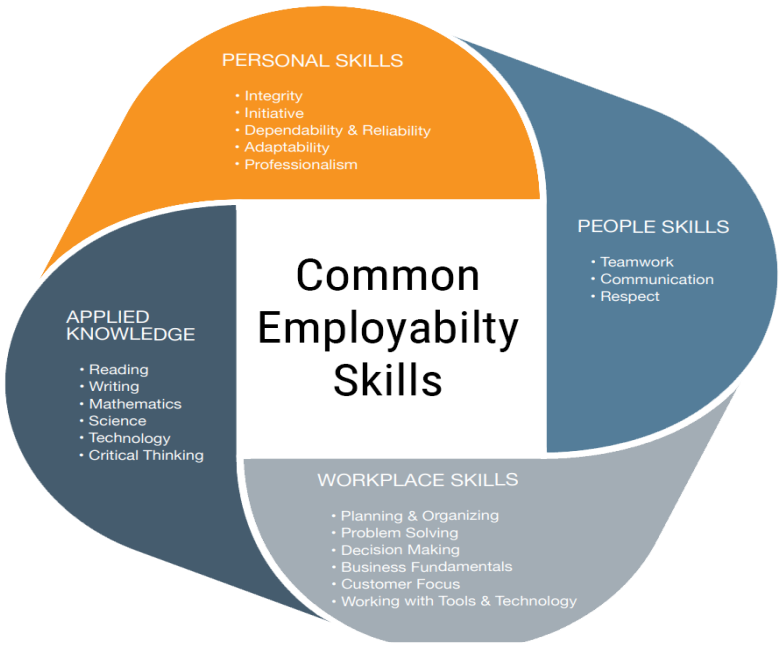

Figure 1. Common Employability Skills
Source: https://www.necessaryskillsnow.org/images/CES-logo-large.png (Accessed May 2022).

Table 1: Showing Nigeria Unemployment Rate
Source: tradingeconomics.com National *Bureau of Statistics Nigeria (Accessed May 2022).*

Nigeria	Last	Unit	Reference	Previous	Highest	Lowest
Unemployment Rate	33.30	percent	Dec/20	27.10	33.30	5.10
Youth Unemployment Rate	53.40	percent	Dec/20	40.80	53.40	11.70
Employed Persons	46488.00	Thousand	Dec/20	58527.00	70665.90	46488.00
Unemployed Persons	23187.00	Thousand	Dec/20	21765.00	23187.00	4672.00
Employment Rate	66.70	percent	Dec/20	72.90	93.60	66.70
Employment Change	187226.00	Jobs	Sep/16	155444.00	499521.00	79465.00

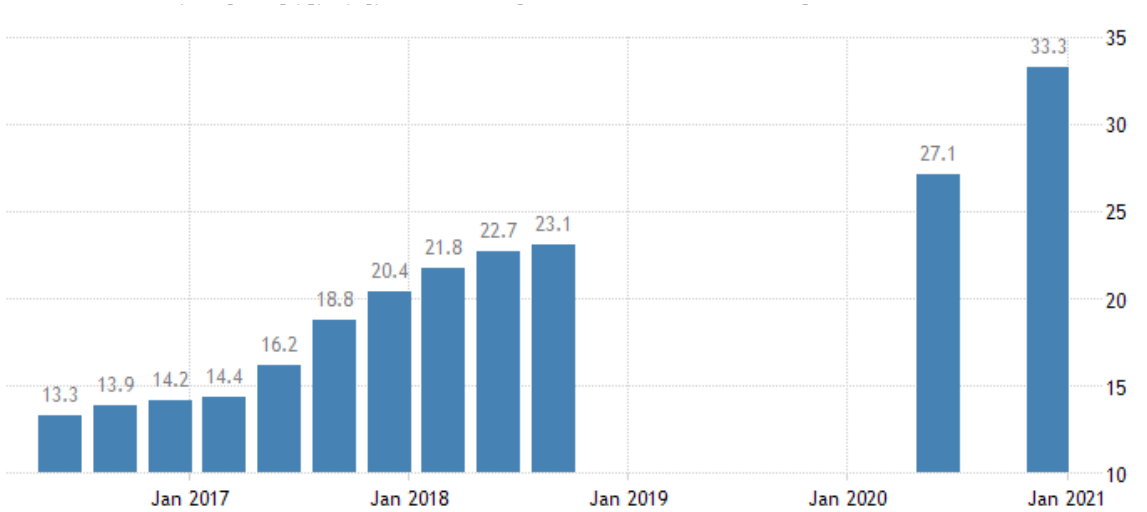

Figure 4: Showing Nigeria Unemployment Rate

Source: tradingeconomics.com National *Bureau of Statistics Nigeria (Accused May 2022).*

The Digitization of Technical and Vocational Education and Training (TVET) and Skills Systems

Work is constantly reshaped by technological progress. Firms adopt new ways of production, markets expand, and societies evolve. Digital technology transforms itself, brings opportunity, creates new jobs, and increases productivity. Employment patterns and attitudes across the labour force as a whole have changed in recent decades. The very first industrial revolution began with the invention of steam and water power, which enabled the mechanization of manufacturing techniques (European Parliament, 2022). Electric power as well as mass manufacturing techniques propelled the Second Industrial Revolution. The Third Industrial Revolution (II) (also known as the digital revolution). Automation and information technology (IT) brought in, which would be described by electronics and IT, automated production, and innovative globalization. Human interactions, commerce, and entire communities have changed as a result of the third industrial revolution. The fourth industrial revolution is being ushered in by a slew of technological innovations that are blurring the lines between physical, digital, and biological spaces. The difference between services and the manufacturing sector becomes less relevant during the fourth industrial revolution as digital technologies are linked with advanced manufacturing goods and services as well as transformed into hybrid products. (European Parliament, 2022)

Figure 2. Changing Nature of Job and Skill in Digital Age.
Source: The changing nature of work and skills in the digital age (ilo.org) (Accessed May 2022).

The fourth industrial revolution (Industry 4.0) is seen as a main driver of innovation in technical and vocational education and training (TVET) (Madsen et al., 2016). Therefore, regulations for digital technical and vocational education and training (TVET) should indeed be considered in terms of adaptation to this new industrial paradigm. Several countries' official policies and strategies imply that technical and vocational education and training (TVET) is responding to:

i. technology and automation of simple tasks. Artificial Intelligence is one example.
ii. terms of the complexity and cost of technology give a more accurate' equipment
iii. new evolving (new) technologies
iv. more sophisticated workflows involving interdisciplinary approach
v. increased flexibility
vi. productivity increases, efficiency, quality, and time to market

Multidisciplinary Digital Competence for the Fourth Industrial Revolution

Competence is defined by Hartig and Klieme (2003) as "the combination of learnable skills and inherent skill sets to behave appropriately in non-standardized situations" (Westera, 2001). In the digital context, there are so many ideas of competence that differ only in nuances. Multidisciplinary Digital Competence (MDC) includes attitudes toward digital devices, digital device handling, as well as content knowledge (Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014). It also includes the aspects of digital security (Ferrari, 2013), digital collaboration (Carretero, Vuorikari, & Punie, 2017), problem-solving and reflection (Eseryel, Ge, Ifenthaler, & Law, 2011), and problem-solving and reflection (Eseryel, Ge, Ifenthaler, &

Law, 2011). (Ananiadou, & Claro, 2009). (Roll & Ifenthaler, 2020) developed an example of non-subject-related development and managing digital libraries for technical apprentices. This

Multidisciplinary Digital Competence (MDC) is defined as "an individual's willingness and ability to behave effectively, personally and socially responsible way in the digital context of professional, social, and private situations."

Adaptation of Technical and Vocational Education and Training (TVET) to Provide Future Skills for Future Jobs

Studies identify the jobs and skills most likely to be replaced by machines. History suggests this is not a predictable linear development. Hence, policy work on future skills requires a tripartite approach involving:

i. expectation of skill needs, as well as areas of deskilling, by surveying emerging technology
ii. teaching of transversal or generic skills, particularly learning-to-learn skills, which would allow people to adapt to future changes in the labour market through continued and lifelong learning
iii. improving the responsiveness of educational systems to emerging trends, which requires close cooperation between education, research, and industry to allow TVET systems to provide skills training in emerging areas at an extremely high level of concept. It is suggested that skills and jobs involving creative endeavors and social interactions are the most likely to show the highest resilience to change in the coming years (Byrnjolfsson, and McAfee, 2014).

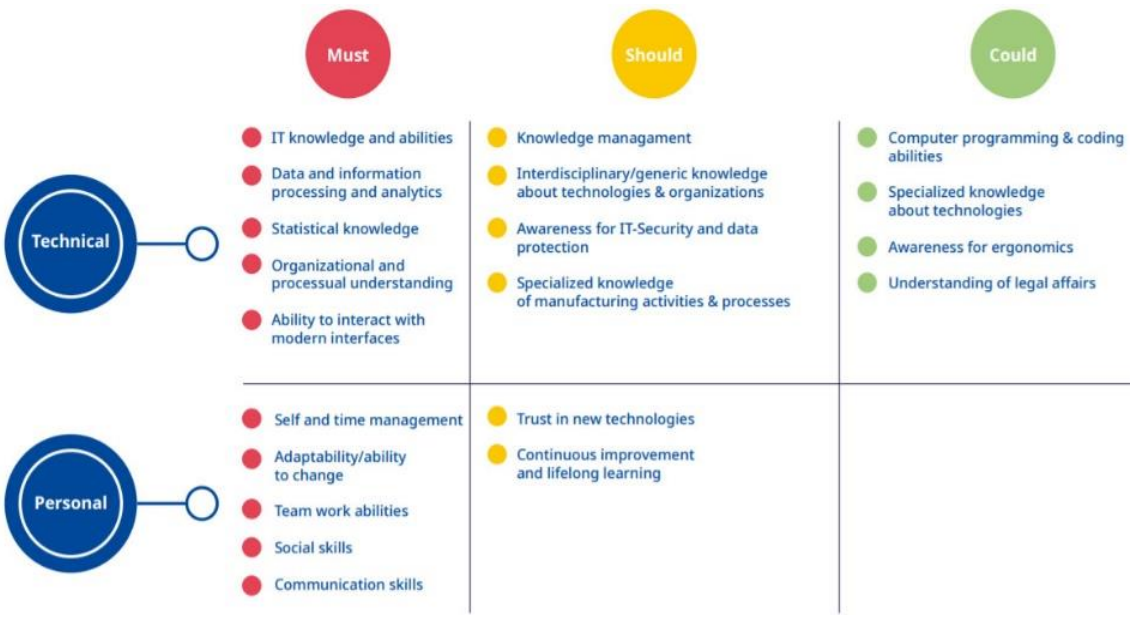

Figure 3. Showing Future qualifications and skills required from TVET
Source: Gehrke et al. (2015). (Accessed May 2022).

Figure 5: Assembly of Job Seekers in Nigeria
Source: https://guardian.ng/opinion/declaring-emergency-on-youth-unemployment/ (Accessed May 2022).

Conclusions

Most Nigerian graduates and youths are unemployable because they do not possess the current skills demanded and needed in the labour market. Most employed youths and graduates are not able to retain their jobs due to the dynamism of jobs and the impact of technological advancement. Most available jobs in the Nigerian market require basic digital skills. Digital technical and vocational education and training (TVET) should be positioned to encourage young people to follow industrial training as a means of securing meaningful and rewarding employment and responding to Nigeria's skills shortages in the process.

Recommendations

Findings show that unemployment in Nigeria has affected the youth and the economic growth of the country. This paper makes the following policy recommendations:

i. **Entrepreneurship Education –** Nigerian government should lay stress on the acquisition of business and digital technology skills through entrepreneurship education in polytechnics. The relevance and utility of entrepreneurship education lie in the practical application of what is taught.
ii. **Youth re-orientation–** More value should be attached to holders of vocational/technical certificates in Nigeria to encourage skill acquisition. If there is proper orientation, people especially the young ones will see the need and the benefits of going for technical/vocational training.
iii. **Job creation –**There is a need to initiate job creation efforts for those who may not be able to stand on their own immediately after graduation. Grants and affordable loan facilities must be made available for youth to set up small-scale businesses.

iv. **Funding –**Adequate funding will make it possible to ensure a revitalized TVET to build a skilled and highly competent workforce of technical professionals. Nigeria's government should increase funding of TVET across the country without further delay.
v. **Monitoring –** It is highly important to put in place good monitoring techniques for any program. Once this aspect of education is given its right place, graduates of the schools who either enter the job market or run their businesses need to be monitored and mentored for possible assistance.

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