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**Technical and Vocational Education Training
Institutions' Influence on Industry and Sustainable
Development Goals in Sub-Saharan Africa**

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Abstract

Purpose: With the increasing awareness among global governments on the need to invest in knowledge and skills as a foundation for developing an employable and globally competitive workforce, Technical and Vocational Education and Training (TVET) is considered pivotal to achieving both national and regional development goals in many countries. The purpose of this study was to establish whether the current TVET training programmes are achieving their purpose of providing the right skill set to the youth to empower and reduce unemployment. The study also identified challenges faced in the TVET sector, and provides recommendations and actions that can be looked into to improve TVET outputs which in turn will contribute to higher industrialization and positively influence Sub-Saharan Africa's sustainable development performance.

Methodology: The study was modelled around the empowerment theory. This article also utilized the systematic literature review which focused on previously published academic studies and published journals discussing on TVET institutions, Sustainable Development Goals and the African Industry.

Findings: TVET institutions have various challenges that unfortunately include the issue of gender and inclusivity itself. Several works of literature have faulted the striking analysis of the gender issue in TVET as simplified. Gender is only captured in policies and there is a serious gap in implementation coupled with a lack of strong parent strategy that makes developing gender-specific TVET policy much more difficult. In addition, there is the issue of quality and standards, and most important resource and capital creation to meet these questions of quality. The highlight of the achievements in this sector however shows there is great potential.

Recommendations: The study recommended that there is a growing need for extensive research, to facilitate better understanding which is thus critical in helping with the provision of evidence for the creation, implementation, monitoring of better policies, and review of the performance of the reforms and other initiatives in this sector. As such, the overall objective therefore should be a continued examination of whether vocational education and training enhance the socio-economic empowerment of youth and women in sub-Saharan Africa as per the sustainable development goals. It will also provide feedback on the quality and relevance of TVET to all stakeholders and its responsiveness to the labor market demand conditions as well as guiding future reforms and investments.

Keywords: *TVET, Sustainable Development Goals, Economic Growth, Unemployment, Economic Empowerment*

Introduction

The structure of education systems in Sub-Saharan countries constitutes of Basic Education, Technical and Vocational Education Training (TVET) as well as University Education. Most countries in Sub-Saharan Africa have invested in policies and provided opportunities for children to enrol in the basic education system, however; post-basic education options available to the youth in these countries are still a challenge. A large percent of the youth do not have access to enrol in institutions of higher education due to a lack of funding and/or inadequate facilities in institutions to cope with the large numbers. Those that are privileged to go through University Education still face a challenge as the job market is limited. This has resulted in a social crisis which has contributed to reduced skill sets in the labor market as well as high unemployment rates. The TVET sector allows for youth to acquire practical skills through work-based learning and can combat the social crisis being faced. Graduates from TVET institutions are equipped with marketable skills that support self-employment. Despite these benefits, the TVET sector in most Sub-Saharan countries is characterized by a significant lack of practical relevance and responsiveness to labor market needs due to insufficient infrastructure and equipment.

Technical and Vocational Education Training Influence on Industry and Sustainable Development Goals (SDGs)

The power of free thinking and empowerment to make informed choices contribute largely to sustainable development by allowing citizens to participate in the development of structures and policies that affect their day to day lives. Lutz (2006) and Asingo (2012) state that the preferences and interests of the less informed tend to be poorly incorporated in decision outcomes Borrowing from the past, and in the interest of understanding the basic concept of economic growth, the idea of the greater good takes much effect. The idea, founded on the classic works of Jeremy Bentham and John Stuart Mill, advocates for the implementation of policies and structures that positively impact the majority.. This idea has been incorporated by many including the adoption of the Sustainable Development Goals by the United Nations in 2015 which aim at poverty eradication, protection of the planet, and access to peace and prosperity for all by 2030. The goals set out is to promote inclusivity fostering the greater good in all aspects and thus eliminating instances of poor judgment. One way of achieving such inclusivity is prescribed in the development of Technical and Vocational Education Training institutions.

According to the definition by the Technical Education Skills and Development Authority in the Philippines, TVET refers to “aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding, and knowledge relating to occupants in various sectors of economic and social life” (TESDA, 2010). TVET is understood as comprising education, training, and skills development relating to a wide range of occupational fields, production, services, and livelihoods. TVET, as part of lifelong learning, can take place at secondary, post-secondary, and tertiary levels and includes work-based learning and continuing training and professional development which may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn, the development of literacy and numeracy skills, transversal skills, and citizenship skills are integral components of TVET (Wang, 2012). According to ILO (2006); Wahba (2013) and Savage and Verdun (2016), vocational skills typically refer to occupations that you can learn

with some basic training or on-the-job instead of a college degree. Electricians, truck drivers, hairstylists, masonry, medical record technicians, and emergency medical technicians are some examples of occupations with vocational skills.

TVET institutions have taken a pole position and are therefore well placed to train skilled and entrepreneurial abilities that current governments are looking for to improve their respective development agendas through poverty reduction (AU 2007). In 2017, for instance, the Kenyan government through the presidency launched the Big Four Agenda comprising food security, affordable housing, affordable healthcare, and most importantly manufacturing. The manufacturing sector remains a key agenda that seeks to increase the contribution of the GDP growth. To achieve this goal, manufacturing alone has increased the demand for skills in various sectors of the economy. This includes the fast-growing construction industry, mining, gas, agro-processing, fish processing, the emergence of the blue economy, ICT, and most importantly the textile industry. TVET skills are critical not only in driving the manufacturing sector but also in creating countless employment opportunities for the increasing population of the young generation. This article focuses on taking a closer look at the role of TVET institutions in relation to industrialization and contribution to the Sustainable Development Goals.

In the interest of understanding the nexus between the industry and TVET, it is worth noting that the world has been through four industrial revolutions. Industry 4.0 a term commonly used in the current fourth revolution involves the use of Information and Communication Technology (ICT) to change the industry using intelligent networking machines, processes, and human capital. According to Madsen et al. (2016), Industry 4.0 is poised to be one of the main drivers of innovation in TVET. The current revolution is based on cyber-physical systems, as such human beings and networked machines now co-operate in decision making. It would be imagined that at some point machines are likely to replace certain skills and jobs. For this reason, therefore, the fourth revolution also means that certain concerns have to be closely monitored and that is: sustainable economic development, social responsibility, and a suitable environment. Thus, TVET has a huge contribution through its guidelines to help shape individuals to work with integrity and competently to ensure that with the emerging technology, the human remains relevant and hence suitable environment.

The Kenya Association of Manufacturers (KAM) realized the industrial need for relevant skills and committed to support the Big Four Agenda through its Technical Vocational and Education Training Program. This program acts as a link by bridging the skills gap, ensuring value addition, technical training, and enhancing policy decisions. The aim is to further drive Sustainable Development Goals as well as achieve a productive workforce. This reveals an inter reliance between Industry, TVET institutions, and the SDGs.. Consequently, it is evident that this relationship has helped shape the system of education from 2020 to date as there is a higher enrollment in TVET institutions (Maina, Kahando & Maina, 2017).

In 2020, data from the Kenya Universities and Colleges Central Placement Service (KUCCPS) indicated that about 10.8 percent of students opted for enrolment at TVET institutions as opposed to applying for degree courses at the university despite meeting the acceptable standards and requirements. There is a gradual shift from the normal structure of the education system as more students are opting to join technical institutions. The changing perception towards TVET institutions exemplifies the indispensable nature of TVET in our education system. In attempting to reconcile the past and the current, the evidence continually reveals the

shocking puzzle the higher institutions of learning are finding themselves in. Against this background of knowledge, therefore, it is prudent to say that there is a growing influence of Technical Institutions in the education structure. This is also supported by the data evidence from the Kenya National Bureau of Statistics (KNBS) which shows, that there was a 35.5 percent increase in student enrolment in the national polytechnics and a 32.8 percent increase in the public technical and vocational institutions (KNBS, 2020).

TVET is thus a central pillar of sustainable and viable economic development. It contributes to the achievement of all 17 SDGs and for that reason promotes a lifestyle that is economically, socially, and ecologically sustainable. SDGs numbers 4, 5, and 8, in particular, highlight the importance of TVET and employment for sustainable development. SDG number 4 demands that inclusive and equitable quality education and lifelong learning opportunities be made available to all. In particular, it calls for better promotion of access to TVET and better promotion of the employability of young people and adults. In a nutshell SDG number 4 targets the elimination of all forms of discrimination in education and paving the way to achieving universal literacy and which is a major component of economic development (Motala et al., 2015). Consistent with the many studies that have been established, it is common knowledge that gender is a component of both human development and a vital aspect of socio-economic development. (Esteve-Volart (2004); Hausmann and Szekely (2001); Kabeer (2003); Kirrin, Rohini and Anju (2007)) Moreover, gender forms a critical part of the sustainable development goals. SDG 5 for instance set out to achieve gender equality and empower all women and girls by eliminating obstacles that would otherwise contribute to gender discrimination, and inequality in work and wages. It advocates for the policy legislation and changes that are geared towards gender equality and eliminations of all forms of exploitation of women and girls (Motala et al., 2015).

In as much as SDG 5 seeks development through equality, it is worth noting that the 17 SDGs are a marriage of information and ideas tailored toward achieving a specific goal. The interest and purpose of one goal directly or indirectly stems from the other to promote an overall theme. SDG 5 remains a pillar to the achievement of all 17 goals in many aspects. Although the aim of this article is to provide an understanding of the advantages of the correlation between the TVET and SDGs, it would be incomplete if it does not address some of the issues that might underscore the subject of interest. The fundamental question arising is to what extent TVET promotes gender equality. As much as gender is an important aspect of development, it is crucial to note that many works of literature have also questioned and documented findings pertinent to this issue. One of the weaknesses discussed is that to a large extent, gender equality is only referenced in the interest of explaining the disadvantages the gender sector is facing in education. This weakness is evidenced by a recent study undertaken by the ILO (2020) that revealed that the female gender lagged behind the male gender in terms of enrolment in TVET in approximately 24 countries across the African continent. In addition, the study also revealed that the female gender partaking vocational training are more likely to be enrolled in courses that train them for lower-paying jobs in sectors such as childcare, beauty, and secretarial work, as opposed to traditional technical trades such as electricity, construction, welding, and plumbing, (UNESCO, 2012; UNESCO, 2013; Gaidzanwa, 2008).

SDG 8 seeks to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. Economies of nations are built on the backbone of information and informed decision which can be attributed to proper training.

According to an article by TVET.GIZ, well-trained people have better chances of finding decent employment opportunities and securing a better livelihood. The availability of qualified experts makes a country or region more competitive as a location for business and investment. At the same time, TVET also contributes to development at a personal level by boosting confidence levels in people's abilities. Thus, forming the basis for self-assured and active participation in community life which in turn fosters social cohesion. To have a positive impact, TVET must be tailored to the needs of society and the labor market and must enable equal access for all which is well articulated in the 2030 Agenda's guiding principle of 'leave no one behind' (Lee et al., 2016).

Ban Ki Moon gave a speech on International Youth Day in 2007 where he stated "We must fulfil our obligations to youth. The World Programme of Action for Youth asks Governments to consider the contributions of young persons on all policies affecting them. Governments must honour this commitment. They must also increase the financial, education and technical support made available to young people. It is high time that we stopped viewing our young people as part of the problem and started cultivating their promise and potential" (Ban, 2016). The youth constitute inestimable assets to any nation and are a formidable force for development when their unbounded energies are channeled towards productive endeavors. The vibrancy of modern society is easily attributed to the impacts that the youth have brought to reliance on technologies (Ki-moon, 2021). To a large extent, the social media, entertainment industry, and sports owe their enviable global status to the creativity and innovativeness of the youth. It is therefore no gainsaying that the future of the world rests on the shoulder of the youth and any form of attention focused on the youth is an investment that will yield tangible returns to society (Pandian, 2013).

Unfortunately, in many sub-Saharan countries, for instance, Kenya, a burgeoning number of youths have not realized their full potential due to the problem of unemployment and limited opportunities for empowerment and growth. Many reasons can be adduced to the unemployment conundrum such as resource mismanagement, corruption, poor planning, population explosion, and dwindling economic fortunes. The Kenyan government in a bid to scale up wage employment and empower the youth economically has in recent years introduced several programs aimed at equipping youth with essential skills for self-reliance, in recognition of the realities that government alone cannot employ the teeming millions of her economically inactive youth (Hope, 2012). This agenda has also been domiciled by the African Union TVET strategy document, which provides a strategic framework for the development of national policies to address the challenges of TVET. The strategy addresses the cross-cutting issues of governance, innovation, creativity, employability, and relevance, with the main thrust being the development of TVET systems that prepare young people to be job creators rather than job seekers (African Union, 2007).

A central theme within the continental TVET strategy is the strengthening of global partnerships to support skills development in the continent. The participation of key stakeholders that include the State, Productive Sector, and Funding bodies has been crucial in TVET development. This strategy advocates for a structured and continuous collaboration between the productive sectors, social partners, training institutions, and professional associations, among other strategic partners. It also calls for encouragement and support for research in TVET institutions. The Constitution of Kenya 2010 and Vision 2030 acknowledge the need to reform education and training to create a sector fit for purpose. To address these

issues, the government provided policy direction for reforms in education and training through sessional paper no. 1 of 2019 (Ngwachio, 2019).

The TVET sector focuses on providing skills that fit the workplace hence providing for decent employment, transformative growth, and guaranteeing human and economic development. The policy is being implemented through the TVET Act 2013 and the KNQF Act 2014 (Ngware et al., 2022). Even though the prime objective of TVET is aimed at providing practical skills, applied skills, and scientific knowledge that are key aspects of the development of a country.

The emerging issue that remains is the identification of efficient and effective practices in the delivery of Technical and Vocational Education and Training that assures quality and standards. In response to quality assurance, the Kenyan government through the TVET act No.29 of 2013 created the Technical and Vocational Education and Training Authority with the sole purpose of regulating the TVET sector to achieve quality and relevance (Muricho & Chang'ach, 2013). Quality of TVET, therefore, refers to a set of characteristics of a TVET competency-based education and training through which mandatory standards set by the stakeholders and the labour market expectations are met. In addition, it also refers to the achievement of outcomes i.e. knowledge skills and attitudes that meet the specific expectations of the trainers and the nation at large, (TVETA handbook 2021).

Empowerment and Its Ramifications

Langer and Lietz (2015) explain the empowerment theory as a social process that assists individuals in gaining control and fostering power over their own lives and environment. This theory promotes self-efficacy, consciousness, personal responsibility, dual perspective, and a reduction in self-blame. Several works of literature have clarified and contextualized “empowerment” from various perspectives (Batliwada (1995); Rowlands (1997); Oakley (2001); Parpart, Rai and Staudt (2002); SDC (2004) and UNECA (2014)). These multidimensional perspectives cover all aspects of human well-being. Piron and Watkins (2004) see political empowerment as “a right-based approach to empowerment” in which citizens are given the voice to stand for their rights and claim their entitlements, while cultural empowerment is the freedom to practice one’s culture.

According to Perkins (2010), the common themes in the definition of empowerment include the following; (a) is a process; (b) occurs in communities; (c) involves active participation, critical reflection, awareness and understanding; and (d) involves access to control over important decisions and resources. He further defines empowerment as not only a process but an outcome of a process for individuals, organizations, and communities.

Economic Empowerment of Women and Youth

Economic empowerment relates to the acquisition of relevant skills, capabilities, and resources that makes it possible to have access to secure and sustainable income and livelihood. Human and social empowerment, according to Page and Czuba, (1999), is “a multi-dimensional social process that helps people gain control over their own lives. It is a process that fosters power in people for use in their own lives, their communities, and in their society, by acting on issues they defined as important.”

The Government of Kenya and other non-state actors have, over the years, made efforts to promote the skills development of young people to acquire competencies needed in the job market and to nurture entrepreneurship. These efforts can be traced way back to the construction of the Kenya - Uganda railway in 1924 when the formal training of artisans and

craftsmen began at Kabete Industrial Training Depot (Simiyu, 2009). During this time, traders and laborers of Indian descent as well as Christian missionaries “brought in technicians and made effort to train Kenyans in different skills to assist in the maintenance of tools and equipment and services for the railway” (Simiyu, 2009). Simiyu (2009, p.13) advances that the “breakthrough for TVET in Kenya was the setting up of a Commission for Higher Education in 1954”. This aided the founding of Royal Technical College that later became the University of Nairobi (Simiyu, 2009), setting the pace for the establishment of other TVET institutions.

The growth of TVET institutions in Kenya has been experienced both in the formal and informal sectors of the economy. These institutions have made significant contributions in bridging the knowledge and skills gap required by youth to be productive in the job market. Despite all these positive efforts by the Government and other non-state actors, many youths in Kenya remain socially and economically disempowered. TVET continues to be deprived of resources, particularly funding and other necessary investments required for its growth. This is in sharp contrast to the reality that many youths are unable to transition to secondary schools, colleges, and universities. Inability to afford school fees and poor academic grades contribute to these poor transition rates, rendering them with limited options for career development.

It is a critical area of inquiry as to whether in this state of affairs, these TVET institutions can impart youth with the much demanded industrial and technical skills necessary for employment and their socio-economic transformation (Tom & Mary Norton, 2018). Although many developing countries have committed resources to TVET that have made substantial progress in realizing the sustainable development goals, challenges remain in most of the TVET systems. Some of these challenges stem directly from poor government policies and a lack of implementation strategies, monitoring, and evaluation of progress Sang, Muthaa & Mbugua, 2012). These challenges include but are not limited to:

1. TVET focuses on training students equipped with technical knowledge and skills to fulfill the job market but due to the lack of enough competent teaching staff, this becomes an uphill task. The ratio of students to trainers has been an issue of great concern. For this reason, most TVET lecturers are sourced directly from other higher learning institutions based on their academic qualifications with less consideration of their skill-set and industrial experiences, and competency.
2. Inadequate infrastructural resources and facilities remain a serious factor that hinders TVET’s mission in realizing sustainable development goals. The TVET program is built to enhance practical skills in construction, improve well-operate design and repair skills for infrastructural and machinery facilities, as well as to strengthen employable skills among students. This goal is not achieved due to lack of educational facilities and equipment, insufficiency of curriculum adjustment for business needs, and industrial linkages.
3. Digital technology drives innovation and plays a critical role in education, work, and life in general. In 2020, TVET institutions were negatively impacted as a result of changes in the learning system due to the COVID-19 pandemic. Globally institutions, organizations, and business resorted to virtual platforms. TVET institutions, instructors, and students struggled to cope with the E-learning system due to lack of technical infrastructure capacity such as internet connectivity, E- learning devices, and media learning platforms. TVET institutions require reliable and timely access to information. The ILO describes access to information in the context of three categories i.e. high-speed internet, wireless delivery, and

- transfer of data from local devices to a computer hosted in data. This, therefore, reiterates the question of affordability, maintenance, and the need for resources.
4. Mismatch between the TVET course structure and applicability to the industry is another challenge that is being faced. Course structures are institution-based as opposed to focusing on actual industrial application. The current successful industries: the General Motors, and the plant engineering industries for instance have not been well linked to these institutions to help foster the acceptable desired change and achieve the acceptable practical skill standard.
 5. Poverty and lack of proper income remain a huge challenge. In 2019 alone according to the World Bank data, the poverty level increased by about 48.4 percent. The COVID-19 pandemic also contributed to job losses resulting in a reduced income. This in turn has affected the enrolment of many students who would wish to foster their development in TVET institutions but are not able to afford.
 6. The last challenge discussed in this article is the recruitment and retainment of competent professional trainers that is crucial for the success of TVET programs. Retention of these trainers is to a large extent affected by obstacles such as poor working environment, high workload, poor incentive mechanisms and reward systems.

Conclusions and Recommendations

The desired potential of Africa has a lot riding on the TVET institutions, especially on human development and economic growth. As such it is safe to say TVET is the answer to skill shortage and skills mismatch in Africa. As indicated the sustainable development goals under its sub-goals focus on inclusivity and equality a factor which is very vital for growth and development at large and thus important in ensuring that Africa as a continent becomes a global powerhouse. TVET sector is making great progress, even so, there is much more that is required in this sector. TVET institutions have various challenges that unfortunately include the issue of gender and inclusivity itself. Several works of literature have faulted the striking analysis of the gender issue in TVET as simplified. Gender is only captured in policies and there is a serious gap in implementation coupled with a lack of strong parent strategy that makes developing gender-specific TVET policy much more difficult, (Elinor et al., 2022). In addition, there is the issue of quality and standards, and most important resource and capital creation to meet these questions of quality. The highlight of the achievements in this sector however shows there is great potential. The challenge, therefore, is to have robust policy guidelines and recommendations aimed at ensuring proper implementation, especially to achieve the very agendas that would help TVET sectors achieve more desirable outcomes.

Recommendations

Though TVET institutions remain pivotal in the understanding and the achievement of Sustainable Development Goals. Information is scant about TVET. It is therefore clear that there is a growing need for extensive research, to facilitate better understanding which is thus critical in helping with the provision of evidence for the creation, implementation, monitoring of better policies, and review of the performance of the reforms and other initiatives in this sector. As such, the overall objective therefore should be a continued examination of whether vocational education and training enhance the socio-economic empowerment of youth and women in sub-Saharan Africa as per the sustainable development goals. It will also provide feedback on the quality and relevance of TVET to all stakeholders and its responsiveness to the labor market demand conditions as well as guiding future reforms and investments.

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