



Bridging Skills Gap: Selected County Governments Innovations in Vocational Training Centers in Kenya to Enhance Sustainable Social Economic Development

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ABSTRACT: The advent of Kenya's devolution in 2010, caused county governments to be critical actors in vocational skills development through the vocational training centres (VTC). This literature review article explored the innovations selected county governments in Kenya had put in place to address the gap in the vocational training centers (VTC) since then. Innovation such as implementation of dual learning model, public private partnerships (PPTs), Competency-Based Education and Training (CBET), formation of "Working Groups" for strategy coordination, infrastructure upgrading and tailoring of county specific local economies courses had been adopted. Further, some trainees had been given the opportunity to work at the Affordable Housing Programme while high-level advocacy, skills fairs and exhibitions were on. Childcare services to vulnerable teen mothers, youth innovation/empowerment centres and mobile solar powered computer classroom had been provided. To enhance sustainable social economic development and to bridge the skills gap further, from the global innovation reviewed, this paper recommends stakeholders to emulate PPTs in Germany and UK where companies bear the workplace training cost. Developing of well-structured apprenticeships and robust quality assurance frameworks and high-quality career guidance should be provided to improve the responsiveness of skills provision. Integration of artificial intelligence, Virtual and Augmented Reality and ensuring full adoption of CBET in all the VTCs should also be emphasized.

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Skills Gap, Vocational Education, Vocational Training Centers, Competency-Based Education and Training, County Government

1.0 INTRODUCTION TO TECHNICAL AND VOCATIONAL EDUCATION TRAINING

There are two pathways in the world of practical career training which are more often used interchangeably or are considered as part of the same. The two are technical and vocational education training abbreviated as (TVET). Though used identically, they have subtle difference. Technical Education, is more academically oriented and often involves a deeper understanding of the theoretical aspects of a field. It strikes a balance between academic theories and practical implementation ensuring students understand the 'why' before the 'how' (Mulder, 2018). Technical education further, acts as a stepping stone to further education or advanced technical roles thus it may lead to associate degrees or certificates. It is geared towards careers that require a combination of technical knowledge and specialized skills like engineering technology, computer science, and advanced manufacturing (American Profession Guide, 2020).

Vocational education training (VET) on the other hand, is an avenue through which the process of education enables people to acquire skills and participate in various jobs including particular trades and crafts or even as technicians. UNESCO Institute for Statistics (2012) defines it as an education programme that uses practice-oriented approach, for learners to acquire knowledge, skills and competencies specific to a particular occupation, trade, or class of occupations manifested in the workplace. It is added to the general basic education but excludes degree and higher-level programs (Gianni, 2006). Besides, it can serve people who did not have a formal education. Courses offered in vocational education are typically shorter in duration, under two years, and more focused on immediate employment opportunities. The students are equipped with muscle memory (Best Trade Schools, 2025). However, there is a fair share of classroom instruction which exposes students to supplementary subjects unrelated to their specialty like communication skills, life skills, guidance and counselling, entrepreneurship or even sociology. It includes course in carpentry,

plumbing, welding, cosmetology, electrician, culinary arts and automotive repairs among the numerous (American Profession Guide, 2020). Most vocational skills are accepted globally qualifying the graduates for employment abroad as well although mainly it provides economic prospects in rural areas and small towns (Dandaya, 2022).

Globally, vocational education and training systems have been recognized as central to addressing skills gaps and supporting socio-economic growth. The skilled manpower is capable of increasing industrial output which leads to sustainable social economic development. Sustainability in this case is the concern for meeting the needs of both present and future generation (Bruntland, 1987).

2.0 VOCATIONAL EDUCATION IN KENYA

Vocational education in Kenya is offered at the post-secondary school level institution known as the Vocational Training Colleges (VTC), (formerly the Youth Polytechnics). Since the advent of devolution in Kenya in 2010, county governments have assumed a critical role in shaping vocational training to meet local labour market demands (Republic of Kenya, 2021). The county governments have been empowered to tailor the VTCs to local economies, but skills gap which occur when a worker's qualification level is higher or lower than that required by the job has been observed. The skills gap has been attributed to absent coordination and consistent financing frameworks which has brought disparity in quality and access across counties. The World Bank's devolution analysis underscores both the potential for localized innovation and the need for national-county harmonization. This growing responsibility has prompted the development of innovative approaches to reshape the vocational training landscape. Innovations in this case, are defined as the creative and effective strategies which have been implemented not only to bridge the skills gap but also to improve the training quality to propel sustainable socio-economic growth (Osumbah and Wekesa, 2023). This article examines these innovations in light of academic and policy literature, assesses their effectiveness, and proposes scalable recommendations based on the global practices and initiatives.

3.0 CASE STUDIES

3.1 Global Innovations in Vocational Training

In Germany and Switzerland, a well-structured apprenticeships and robust quality assurance frameworks have been built in their vocational training institutions (The European Commission (2020)). As a result, the institutions enjoy higher employer confidence and smoother school-to-work transitions. Davos-Klostern (2022) also observed that Germany and United Kingdom (UK) companies bear the costs of workplace training or pay contributions to a general fund that covers the apprenticeship costs of the institutions. In UK particularly, employers are expected to provide co-funding to invest in their current and future workforce in England through the Employer Ownership of Skills Pilot (EOP). To close the skills gap, in Australia, employer involvement has been found to boost apprenticeships provision comprising of an assortment of classroom learning and practical work experiences. Rigorous quality assurance mechanisms should also be embedded in the system to ensure mobility and recognition (Davos-Klostern, 2014).

In New Zealand through New Zealand Career Services (CS), a vocational training policy goal fully focused on customers, businesses and employee have been developed. CS is an independent body from the education system tasked with provision of career guidance and counselling. It includes high-quality career guidance counselling provided to the young people and their families, to improve the responsiveness of skills provision and reduce skills gaps. Included in the services offered by CS is making informed work and training choices, including the provision of labour market information like job profiles and industry outlooks as well as tertiary and trade training information. The body also develops guidance modules for schools; notably, the Creating Pathways and Building Lives (CPaBL) programme which assists schools to develop effective career advice (McKinsey, 2012).

Artificial intelligence (AI) has been integrated in vocational education to support skills development. This has been pioneered in Germany and Singapore (ReferNet Germany and Cedefop, 2025). German has ventured into important research aimed at designing AI-driven tools for competency rating and training personalisation, showing significant improvements in training outcomes and efficiency. That is done through the Germany's Federal Institute for Vocational Education and Training (BIBB) and the German Office for International Cooperation in Vocational Education and Training (GOVET) The county governments could look into the same with modification. In Singapore, AI is being employed to provide personalised learning recommendations based on one's career interests, job roles, and skills gaps. The inventions success is said to rest in its potential to vigorously position training programs with the evolving needs of the economy, ensuring that the staff remains competitive and adaptable (Gopalan, 2024).

The outstanding extended reality (XR) technologies such as Virtual and Augmented Reality (VR/AR) which allow students to master skills within safe simulated environments have been implemented in Vietnam, Germany, South Korea and Ghana with great success. They create fully immersive, lifelike spaces where learners can practice and polish their skills without expense or geographical drawbacks (Chiang, Shang and Qiao. 2021). Although, the cost of these technologies has prevented them from being used widely, in recent years, the availability of AR applications and improvements in hardware equipment have facilitated AR adoption in many countries.

In Turkey, Provincial Boards of Employment and Vocational Education has implemented Provincial Boards of Employment and Vocational Education to coordinate vocational education at the provincial level. These boards include local governments, education institutions, employers, and labor unions, ensuring that vocational training aligns with local labour market demands. This mirrors

the Kenyan county model, where counties are responsible for managing VTCs and coordinating industry partnerships to bridge skills gaps (OECD, 2025a).

In Germany, vocational education is co-governed by the federal and state governments. States manage vocational schools and implement region-specific curricula in coordination with employers. This model demonstrates effective decentralization that balances local responsiveness with national quality standards, offering lessons for Kenya's counties in curriculum modernization and skills alignment (OECD, 2025b).

In India, states are actively involved in designing and delivering Technical and Vocational Education and Training (TVET) through their own regulatory bodies and training institutes. By tailoring programs to local industrial and economic priorities, states have been able to reduce skills mismatches.

In South Korea, municipalities operate community learning centres and VET programs targeting adults and youth. Local governments coordinate training with employers to ensure relevance to regional labour markets. In Uganda, Skilling Uganda program aligns vocational training with employer demand, emphasizing public-private partnerships and decentralized management. Regional and district-level authorities adapt training provision to local economic conditions, enhancing employability. Kenyan counties can draw from this model in expanding employer involvement and tailoring programs to regional value chains (Agrawal, 2013).

These case studies collectively demonstrate that decentralized governance of vocational education when paired with strong collaboration between government, industry, and training institutions can significantly enhance skills relevance and employment outcomes.

3.2 County Specific Innovations and Initiatives to Bridge the skills Gap in Kenya

Counties across Kenya have rolled out place-based innovations that respond to local economic strengths and labour market gaps. Below are examples of innovations:

Several county governments in Kenya have undertaken efforts to modernize and align vocational training curricula to meet contemporary industry needs. The Nairobi County Government has intensified their efforts in planning for the future of vocational training. To achieve their goal, in 2024, the county started bringing together all stakeholders from Nairobi County Vocational Training Centers for breakfast meetings. At their meetings, the stakeholders drew up sets of strong recommendations for curriculum modernization in priority areas such as digital skills, emerging technologies, and industry-specific competencies. Soft skills such as communication, teamwork, and problem-solving were to be integrated in the modernized curriculum. The stakeholders committed to increase regular reviews and updates to keep pace with industry dynamics. A "Vocational Education and Training Working Group" was formed to coordinate the formulation and implementation of strategies to revolutionize the vocational training in the county (Nairobi City County, 2024). The implementation of the stakeholder's recommendations by the technical working group are yet to be made public.

In Makueni County a skills pipeline for modern agriculture has been build. Agricultural TVET are being paired with digital/innovation infrastructure. The flagship is the Makueni Agricultural Training Centre (ATC) at Kwa Kathoka now being formalized as a semi-autonomous college to deliver short, competency-based courses that blend classroom and farm-based learning in high-demand value chains (horticulture, dairy, poultry, aquaculture, apiculture) (County Government of Makueni, 2023). The County has also rolled out youth empowerment cohorts and tech-innovation hubs that provide soft, digital, and entrepreneurship skills, increasingly delivered through Vocational Training Centers (VTCs) and County Technical Training Institutes (CTTIs) (County Government of Makueni, 2025a; 2023b).

Apprenticeships and training opportunities have been advocated as helpful to maintain a link with the labour market as job-specific and work-based skills are difficult to learn other than on the job (World Economic Forum, 2019). In connection to that, Makueni County is offering dual learning model which is an approach that combines theoretical learning in a classroom setting with practical, hands-on experience in a workplace or real-world context. The dual training has been widely acknowledged recently (Dieter, 2023). The county combines (school + farm) training where cohorts train for 6 months with structured practical on demonstration farms, anchoring competence against real production and husbandry standards (Makueni, 2023a). Targeted value-chain skills (e.g., dairy, horticulture) plus entrepreneurship soft-skills answer employer and self-employment needs in a largely agrarian county (Makueni, 2023a; 2025a). Modular training in horticulture, dairy, poultry, aquaculture, and beekeeping allow rapid skilling and upskilling tied to county value-chain priorities (Makueni, 2023a). Youth cohorts receive employability, entrepreneurship, and digital skills via county programs hosted in VTCs/CTTIs and KMTC-Mbuvo (Makueni, 2025a).

Public private partnerships (PPPs) among governments, employers and private sector brings education and the working world closer together. It has been reported as an effective way of bringing better labour market information to education which helps overcome the skills mismatch (Davos-Klosters, 2022). In regard to PPPs, counties are increasingly engaging local businesses and industry associations to assist in curriculum development, resource mobilization, and trainee placement. Garissa and Turkana, the two counties hosting refugees in Kenya, have partnered with International Labor Organization, (ILO) PROSPECTS Kenya, the East Africa Institute of Welding (EAIW) and the Kenya Association of Manufacturers (KAM) to address unemployment challenges by promoting skills and knowledge that are demand-driven and highly relevant in the job market ((International Labor Organization

(ILO, 2023). Through the partnership with ILO, programmes have been strengthened to deliver market-driven skills in the upcoming infrastructure development in oil and gas sectors in the counties CVTs.

Other activities carried out within the partnership in the two counties was the training of 70 youth including 25 refugees, at the East African Institute of Welding in Nairobi through The Competency-Based Education and Training (CBET) curriculum. Sixty-eight trainees successfully graduated from the pilot programme and 17 managed to find employment. Mirage. News (2021) observed that the two counties were considered for the partnership due to their arid nature and the fact that they had hosted refugees for the last two decades with limited resources. Further, a needs assessment to evaluate the capacity of the trainees to implement Competency-Based Training in Welding and Fabrication was done at VTC centers in both counties. The assessment was referenced against nationally accepted standards, Curriculum Development, Assessment and Certification Council (CDACC) Level 4 and ISO 9606 (ILO, 2023). The assessment indicated that TVET centres lacked CBET curriculum trainers, assessors and verifiers registered with the Technical and Vocational Education and Training Authority (TVETA) in Kenya. As a result, in 2022, 15 trainers, including two women, were part of a Training of Trainers (ToT) programme aimed at strengthening the capacity of the county governments to design, coordinate and implement blended dual-training programmes which would be replicated in other technical fields in future. Further, two institutions, Lodwar and Garissa TVET Centres, were provided with upgraded classrooms, welding workshops and electricity connections. Equipment was provided in the upgraded classroom which included, welding machines, grinders, vices and training resources, based on industry standards to ensure that students could attain all CDACC level 4 and ISO 9606 competencies. ILO also sponsored 140 young people from Garissa and Turkana counties to receive competency-based welding skills training at the local TVET centres. As a result of the partnership, the perception of the community in the two counties towards TVET courses has improved due to high-level advocacy spearheaded by the ILO. They are no longer seen as a last resort, but rather a preferred career choice (ILO, 2023).

Kisumu County has upgraded vocational training infrastructure at local VTCs through a partnership with Swiss NGO, Comundo. At Sabako VTC (Kisumu West), modern fish farming has been integrated into vocational training, while Akado VTC (Kisumu East) gained a motor vehicle mechanics workshop. This partnership is part of a larger effort to create Centres of Excellence in technical skills, tied to local industry demands (Capital News, 2025; The Eyes Watch Media, 2025). The County has also reinforced the skills initiatives through policy and financing. In 2024/25, the county allocated Ksh 90.5 million in capitation grants for youth in TVET and an additional Ksh 22 million for equipment. This funding supports blue economy courses and tool provision across vocational centres (Education News, 2025). Furthermore, the Kisumu County VET Policy (2024) serves as a roadmap for aligning vocational training with entrepreneurship, value addition, and emerging sectors like the blue economy (Education News, 2025).

Similarly, Makueni county has also entered into partnerships. For instance, it has teamed up with key developmental stakeholders with concrete contributions to boost the quality of the VTCs. KCB Foundation funds Makueni Youth Empowerment Service (M-YES) trainees for 3-months on hydroponics vocational training at Miramar International College (KCB Foundation, n.d, Light for the World–Makueni, 2025). Another internship program to note in Makueni county is that of Kisingo VTC which has partnered with the contractor building the Governments Affordable Housing Project. The trainees in masonry industry from the VTC have had an opportunity to work at the Affordable Housing Project a flagship project by the Government of Kenya with the guidance of their instructor. On top of gaining experience, they are given daily allowance, which is used to support their training fees (Kisingo VTC, 2025)

In Nairobi County, Some VTC rests solely on alternative funding sources which is a form of partnership. A case in point is Mathari VTCs, where students rely on a patchwork sponsorship from NGO's such Shining Hope for Communities (SHOFCO), Girl Child Network, Makao Organization. In spite of that, effectiveness of integrating internships and on-the-job attachments into the training program remains a major concern (National Taxpayers Association, 2014).

Programmes successful at improving school enrolment and attendance, as well as child nutrition and health have proved to raise increasing participation. In an effort to improve teen mothers' enrolment and attendance to acquire skills, Kisumu County signed an MOU with Kidogo to provide childcare services at their VTC centres. Kidogo is a social enterprise providing high-quality, affordable early childhood care and education for families living in Africa's urban slums, (Dye, 2021). Adolescent pregnancies increased particularly during the Covid-19 pandemic. Many vulnerable young mothers enrol in the Vocational Training Centre (VTCs) after giving birth but lack of baby caregivers was a thorn observed in many counties. Those from economically challenged family in the VTCs were forced to attend training sessions with their babies. The partnership with Kidogo was piloted in three VTCs — Ahero, Akado and Obange with future plans to enlarge them to the 23 centres in the county. The centres have ensured that young mothers do not have to choose between going to school and taking care of their little ones.

To build up the capacity of trainers and accelerate actualization of Competency-Based Education and Training (CBET), Nakuru County has partnered with organizations like Colleges and Institutes Canada (CICAN), the International Labor Organization (ILO), and Forum CiV. The program provides opportunities for individuals with technical skills developed outside formal education to acquire formal qualifications, enhancing employability and lifelong learning. The partnership has enabled the VTC to acquire modern tools. According to Gichinga (2023) the county has also partnered with industry experts which has enabled VTCs to train

competent youths ready for the job market while on its part the county government has been paying tuition fees to ensure increased enrolment and retention rates.

Tana River County has made notable strides in addressing the skills gap through targeted innovations. For instance, a central initiative is, the establishment of the Youth Innovation and Empowerment Centre, which provides training in digital literacy, entrepreneurship, hospitality, tailoring, and creative industries. The Centre also serves as a hub for mentorship, business incubation, and leadership development, thereby equipping youth not only with technical competencies but also with transversal skills essential for self-employment and participation in the digital economy (Council of Governors, 2023). Complementing this effort is the Ditruck project, a mobile computer classroom equipped with laptops, virtual reality headsets, and solar power that delivers digital literacy training to young people in remote areas. This innovation directly addresses the digital divide and prepares youth for opportunities in the emerging knowledge economy (Kenya News Agency, 2023). Similarly, the county's partnership with the Ministry of ICT to establish ICT parks has expanded access to digital infrastructure, creating new avenues for skills development in technology-driven sectors.

Beyond digital skills, Tana River has also prioritized sector-specific training in agriculture and climate-smart practices. Through collaborations with development agencies, the county has introduced programs that equip farmers and youth with knowledge in irrigation, agroforestry, livestock management, and sustainable water use. Such initiatives not only align VTCs with the county's pastoralist and agricultural economy but also enhance community resilience to climate change while creating new livelihood opportunities (Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), 2024).

Literature shows that in several regions, vocational education is stigmatized as inferior to academic pathways, leading to low enrollment and employer skepticism toward graduates (The European Commission, 2020). To bridge that gap Makueni County has launched exhibitions to showcase the exceptional talents of youths trained across various vocational disciplines. A case in point is the first exhibition named Makueni County Skills Exhibition held at Springhill Kwakakulu County Vocational Training Centre (VTC) on September 19, 2024 themed "*Translating Skills to Employability*," (Government of Makueni County, 2024). Practical skills and crafts of skilled youth and trainees, were showcased. The focus was on garment construction, such as high-quality dustcoats and other vocational talents. The exhibition was also used as a tool to create enough awareness to the local community on the courses offered as lack of awareness on course offered in VTC had been found to be a challenge by a study done in Kajiado County (Sankale, Sakwa and Ndegwah, 2017)

Equally, Tana River County holds annual exhibition named, "Tana River County Skills Fair and Exhibition" which gives vocational centers a platform to showcase their programs and connect graduates with employers, thereby enhancing visibility and employability (Kenya News Agency, 2022).

4.0 RECOMMENDATION

- i. Although majority of the county governments in Kenya had entered into partnership, it is important to enhance the partnerships by emulating countries like Germany and UK where partner companies bear the costs of workplace training or pay contributions to a general fund that covers the apprenticeship costs of the institutions (Davos-Klosters, 2022). The PPTs can also provide co funding to invest in their current and future workforce like in England through the Employer Ownership of Skills Pilot (EOP).
- ii. There is need for the county governments to build well-structured apprenticeships and robust quality assurance frameworks as has been done Germany and Switzerland. That way the VTCs would enjoy higher employer confidence and smoother school-to-work transitions (The European Commission, 2020).
- iii. The counties need to develop or adapt and modify a training policy goal that is fully focused on customers – businesses and employees as has been done in New Zealand through New Zealand Career Services (CS). This would assist the institutions to develop effective career advice (McKinsey, 2012).
- iv. The county government should look into ways in which they can integrate artificial intelligence (AI) into vocational education to support skills development as has been pioneered in German and Singapore. They could also emulate what the Germany's Federal Institute for Vocational Education and Training (BIBB) and the German Office for International Cooperation in Vocational Education and Training (GOVET) has done.
- v. The outstanding extended reality (XR) technologies such as Virtual and Augmented Reality (VR/AR) could also be looked into by the county governments as they allow students to master skills within safe simulated environments as has been done in Vietnam, Germany, South Korea and Ghana with great success (Chiang, Shang and Qiao. 2021).
- vi. All the counties need to evaluate ways to adopt and spearhead for Competency-Based Education and Training (CBET) advocated for by regulatory bodies such as Technical and Vocation Education and Training Authority (TVETA) for quality assurance and Vocational Education and Training, Curriculum Development, Assessment and Certification Council (TVET-CDACC) (Republic of Kenya, 2013). This is because implementation studies show promise but notes variability across institutions. This would assist the VTCs to shift from input/output measures to demonstrable occupational competencies. Under (CBET) model, curricula are designed in close consultation with employers, and students are assessed based on demonstrated competencies rather than theoretical knowledge.

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