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Influence of County Government Training Facilities and Equipment on Trainees' Skills Acquisition in Vocational Training Centres in Makueni County

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Abstract

Technical and Vocational Education and Training (TVET) play a crucial role in advancing Kenya's development agenda and the global Sustainable Development Goals (SDGs) by promoting youth employability and reducing skills gaps. County Vocational Education and Training Centres (CVETCs), the grassroots units of TVET delivery, are expected to equip trainees with practical and market-ready competencies. However, inadequate funding, limited training facilities, outdated equipment, and insufficient instructional support continue to constrain effective skills acquisition, particularly in Makueni County. This study evaluated the influence of County Government funding interventions on trainees' skills acquisition in CVETCs in Makueni County, focusing on staffing support, provision of training facilities and equipment, and financial allocations. Guided by General Systems Theory (GST), the study adopted a sequential mixed-methods design. The target population included 60 managers, 277 instructors, and 4,577 trainees, of whom 1,474 were selected via simple random sampling. Data were collected using questionnaires for trainees and instructors and interview schedules for managers. Validity was ensured through expert review, and reliability was tested using Cronbach's Alpha. The study found that, regarding sanitation, 53.4% of trainees reported that toilet facilities were adequate; however, 61.2% of instructors expressed dissatisfaction, indicating inconsistent maintenance and equity across CVETCs. Adequate sanitation is crucial for health, attendance, and effective learning, especially for female trainees.

Keywords: *Training Facilities; Equipment Interventions; Skills Acquisition; County Government Support and County Vocational Education and Training Centres*

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1. Introduction

The global economy is experiencing an unprecedented rise in demand for skilled labour, with projections estimating a shortage of over 85.2 million skilled workers by 2030 (Korn Ferry Institute, 2018). Such shortages hinder organizational performance and could result in annual economic losses of USD 8.5 trillion (Lan & Hualupmomi, 2022). To address this growing skills gap, countries are increasingly prioritizing technical training, which equips learners with job-specific competencies needed in modern labour markets. Technical training, defined as the acquisition of practical, measurable, and occupation-specific skills through hands-on

engagement (Thompson, 2019; Ahmad et al., 2011), is therefore central to human capital development.

Technical and Vocational Education and Training (TVET) institutions play a pivotal role in producing graduates with employable skills needed for national development. TVET equips learners with competencies relevant to both formal employment and self-employment and is globally recognized for linking education to industrial needs (UNESCO, 2017). Skills acquisition, the dependent variable in this study, refers to the practical knowledge, attitudes, and abilities trainees gain to perform job tasks effectively (Rasul et al., 2010). In technical institutions, this process relies heavily on the availability of functional workshops, adequate tools, well-equipped laboratories, and modern equipment aligned with industry standards (Learning Organization, 2023). Without these facilities, trainees' ability to acquire relevant skills becomes severely constrained.

Globally, countries such as those in Europe have long-established TVET systems that emphasize industry-aligned facilities, apprenticeships, and occupation-specific training supported by strong public investment (Cedefop, 2017; European Commission, 2019). Similarly, Asian and Pacific nations highlight the role of adequate training resources in addressing acute skills shortages (Lan & Hualupmomi, 2022). However, many developing countries continue to struggle due to poorly equipped training centres, obsolete tools, and limited investment in modern infrastructure (World Bank, 2023; UNESCO-UNEVOC, 2018).

Across Africa, the situation is similar. Studies reveal chronic gaps in training equipment, inadequate workshops, low digital integration, and weak institutional management capacities (UNESCO-IIEP, 2021; TVET Colleges, 2024). In Nigeria and Egypt, shortages of instructional resources, low funding, and negative perceptions further undermine the quality of skills training (Chika & Edomwonyi, 2021; Álvarez-Galván, 2015). These deficiencies directly undermine trainees' ability to acquire practical, industry-relevant competencies.

In Kenya, the evolution of technical training from Village Polytechnics to County Vocational Education and Training Centres (CVETCs) under the 2010 Constitution entrusted county governments with the mandate to provide training infrastructure, equipment, and learning resources (Republic of Kenya, 2021). CVETCs contribute significantly to the national workforce, supplying essential skills in sectors such as engineering, ICT, construction, textiles, hospitality, agriculture, and manufacturing (Kimathi et al., 2020; Uri, 2014). Furthermore, CVETCs play a central role in achieving the Sustainable Development Goals, particularly SDG 4, SDG 8, SDG 9, and SDG 11, by enhancing employability, fostering industry development, and reducing poverty.

Despite this potential, CVETCs face persistent challenges primarily linked to inadequate and outdated training facilities and equipment. Studies conducted in various Kenyan counties reveal insufficient workshops, obsolete tools, limited ICT infrastructure, inadequate textbooks, and low alignment between training equipment and labour market needs (Kalio, 2020; Mugambi, 2018; Kirui, 2022; Ndugutuson, 2014). These deficiencies diminish trainees' opportunities for practical learning and hinder their acquisition of employable skills.

In Makueni County, similar challenges have been documented. Mutuku (2018) reported insufficient funding, lack of functional workshops, obsolete tools, and acute shortages of well-equipped training facilities across CVETCs. These constraints significantly limited trainees' exposure to practical tasks and reduced the relevance of the skills they acquired. Although the County Government of Makueni has developed policies to address these shortages, including competency-based training, enhanced digitization, upgrading apprenticeship systems, and

strengthening partnerships (Makueni County Education and Training Policy, 2022), gaps remain between planned interventions and actual on-the-ground conditions.

Given the county government's statutory responsibility to provide training facilities and equipment to CVETCs, and in light of persistent deficiencies highlighted in existing studies, there is a clear need to empirically evaluate how the county government's provision of training facilities and equipment influences trainees' skills acquisition. The limited local evidenceon the direct impact of facilities and equipment interventions on skills acquisition within Makueni County creates a critical knowledge gap.

This gap between county government interventions, existing challenges, and the expected outcomes in trainees' skills acquisition necessitated the present study, which evaluates the influence of county government-provided training facilities and equipment on trainees' skills acquisition in CVETCs in Makueni County.

1.1 Problem Statement

County Vocational Education and Training Centres (CVETCs) in Makueni County are mandated to equip trainees with technical skills that meet labour market demands. In response, the County Government of Makueni has introduced several interventions, particularly the provision of training facilities and equipment to strengthen skills acquisition in these centres, as stipulated in the Constitution of Kenya (2010) and the County Vocational Education and Training Act (2021).

Despite these efforts, CVETCs continue to face significant challenges related to inadequate, outdated, or non-functional training facilities and equipment. Such resource gaps limit the effectiveness of practical training, weaken the acquisition of industry-relevant competencies, and contribute to the persistent mismatch between trainee skills and labour market expectations. Existing studies conducted in Makueni County have focused mainly on general institutional challenges or trainee participation, but have not empirically examined the specific influence of the County Government's provision of training facilities and equipment on trainees' skills acquisition.

Consequently, there remains limited evidence on whether the County Government's investments in facilities and equipment have translated into improved training outcomes, enhanced employability, or better alignment with job market needs. This lack of clarity creates a gap in policy implementation and hinders efforts to strengthen technical training. Therefore, it was necessary to evaluate how county-provided training facilities and equipment interventions influence trainees' skills acquisition in CVETCs in Makueni County, and to identify areas requiring improvement to enhance TVET outcomes.

1.2 Purpose of the Study

The purpose of this study was to evaluate the influence of County Government provision of training facilities and equipment interventions on trainees' skills acquisition in County Vocational Education and Training Centres (CVETCs) in Makueni County.

1.3 Justification of the Study

The County Government of Makueni plays a central role in the development and management of County Vocational Education and Training Centres (CVETCs), particularly in providing training facilities and equipment to support effective skills acquisition. Modern, adequate, and industry-aligned facilities and equipment are fundamental for practical learning, yet many CVETCs continue to struggle with outdated tools, insufficient workshop spaces, inadequate

ICT infrastructure, and limited access to modern training materials. These gaps undermine trainees' mastery of technical competencies, limit their employability, and weaken CVETCs' contribution to the county's socio-economic growth.

Despite ongoing county investments, there is limited empirical evidence showing whether these facility and equipment interventions have improved training quality and skill acquisition. Existing studies in Makueni County have mainly addressed general challenges in CVETCs without assessing the direct impact of County Government interventions. This creates a knowledge gap for policymakers, CVETC managers, and development partners who require data-driven insights to guide resource allocation, strengthen program implementation, and enhance training efficiency.

The study was therefore justified because it will:

1. Provide evidence-based assessment of the extent to which training facilities and equipment provided by the county government influence trainees' technical skills acquisition.
2. Guide policy and budget decisions by highlighting what is working, what is inadequate, and which areas require prioritization to improve TVET outcomes.
3. Support alignment with labor market needs by assessing whether existing facilities and equipment match current industry standards.
4. Contribute to improved employability and socio-economic development by identifying interventions that enhance trainee competence and productivity.
5. Inform planning and future investments within Makueni County and other devolved units seeking to strengthen TVET for sustainable development and achievement of SDG 4.3.

Overall, the study is essential in ensuring that County Government resources directed toward training facilities and equipment yield meaningful improvements in trainee skills acquisition, thereby maximizing the impact of CVETCs in fostering a skilled and competitive workforce.

2. Literature Review

2.1 Theoretical Review

This study is grounded in General Systems Theory (GST) by Brent D. Ruben (2018), which views organizations as open systems composed of interdependent components that continuously interact with their external environment. CVETCs in Makueni County operate as open systems whose performance depends on inputs from the County Government, particularly the provision of training facilities and equipment. According to Bastedo (2004), open systems are influenced by socio-economic, political, legal, and educational factors in their environments, which shape how interventions are implemented and utilized.

GST outlines four key components: inputs, transformation processes, outputs, and feedback (Lunenburg, 2010). In this study, county government-provided training facilities and equipment constitute the inputs that support instructional activities. The transformation processes involve practical training and pedagogical engagements through which trainees convert these resources into competence. The outputs represent the level of trainees' skills acquisition, including their employability and capacity for self-employment. Feedback emerges from industry stakeholders who assess the relevance and quality of the skills provided.

GST is therefore suitable for this study as it explains how the adequacy and quality of county-provided facilities and equipment directly influence training processes and ultimately determine the effectiveness of skills acquisition in CVETCs.

2.2 Empirical Review

Adequate training facilities and modern equipment form the foundation of effective skills acquisition in Technical and Vocational Education and Training (TVET). Guenter (2023) defines training facilities as physical infrastructure, such as classrooms, laboratories, workshops, offices, sanitation, storage, and utilities, while equipment includes tools, machines, instructional materials, and consumables required for hands-on, industry-relevant training. Globally, many TVET institutions face shortages of up-to-date equipment, compromising learners' acquisition of practical competencies. For instance, studies in Malaysia revealed persistent inadequacies in tools, machines, and workshop resources, forcing institutions to rely on donors (Subramaniam et al., 2023).

Across Africa, inadequate workshops and obsolete laboratory equipment remain major barriers to effective practical training. Audi (2013) found that insufficient workshops in Nigeria hindered trainees' practical exposure, while Dora et al. (2012) established a strong link between the availability of workshop equipment and the development of employable skills. In Kenya, several studies—Ndugutuson (2014), Mugambi (2016), Kalio (2018), Ochola and Kavinda (2019), and Ojera et al. (2021)—reported that most TVET institutions lacked adequate workshops, classrooms, and updated equipment. The low equipment-to-student ratio in many regions further limits meaningful practice (Ojera et al., 2021).

Studies also show shortages in course books, reference materials, and library resources (Kalio, 2020), while ICT facilities remain largely underdeveloped in CVETCs. Kirui (2022) observed that computers available in many CVETCs lack internet connectivity and functional ICT laboratories. Similar concerns are reported in Murang'a County, where inadequate equipment and poor facilities have negatively affected service delivery in village polytechnics (Omwenga & Mugo, 2023). In Nairobi County, Mugambi (2016) found that outdated institutional equipment made it difficult for trainees to cope during industrial attachments using modern machinery.

While these studies provide insights into facilities and equipment challenges across different counties, none specifically evaluate the influence of County Government-provided training facilities and equipment on skills acquisition in CVETCs in Makueni County. Existing local studies focus on general TVET challenges rather than county-specific interventions. Given that practical skills acquisition heavily depends on facilities and equipment, this study seeks to assess the extent to which Makueni County's interventions have addressed resource gaps and enhanced trainees' competency development.

3. Methodology

This study adopted a Convergent Parallel Mixed Methods Design**,** which enabled the simultaneous collection and analysis of quantitative and qualitative data to evaluate how county government-provided training facilities and equipment influence trainees' skills acquisition in CVETCs in Makueni County. According to Creswell and Plano Clark (2018), this design enhances complementarity by enabling researchers to compare quantitative trends with qualitative explanations. Quantitative data were gathered using structured questionnaires administered to instructors and trainees to measure the adequacy, accessibility, and effectiveness of County-provided facilities and equipment. Qualitative data were collected

through interviews with CVETC managers to gain deeper insights into how county interventions shape training environments, practical exposure, and competency development.

The study was conducted in Makueni County, a largely rural region whose 60 CVETCs depend heavily on county funding for infrastructure and equipment (Government of Makueni County, 2024). The target population comprised 4,914 respondents: 60 managers, 277 instructors, and 4,577 trainees. A sample of 1,474 respondents was selected using a combination of purposive and lottery sampling, consistent with Mugenda and Mugenda's (2013) recommendation to sample at least 10% of the population, provided the population is below 10,000.

Research instruments included questionnaires and interview schedules validated through expert review (Yusoff, 2019) and pilot-tested in three CVETCs to refine clarity and relevance. Reliability was assessed using Cronbach's alpha, with acceptable thresholds set at $\alpha \geq 0.70$ (Cortina, 1993). Quantitative data were analyzed using descriptive and inferential statistics in SPSS Version 29, while qualitative data underwent thematic analysis to explain how county-provided training facilities and equipment influence trainees' acquisition of technical and soft skills.

4. Results

The analysis of training facilities and equipment in Makueni County CVETCs reveals mixed but critical insights into how infrastructure affects trainee skill acquisition. The provision of toilets, power, water, sewage systems, training equipment, and instructional materials shows significant disparities across institutions, with trainees generally reporting more positive perceptions than instructors.

Findings show that sanitation and hygiene facilities remain uneven, with slightly more than half of trainees satisfied with toilet adequacy, while instructors are strongly dissatisfied. The power supply appears moderately reliable among trainees (60.1% agreement), yet over half of instructors perceive it as inadequate, suggesting structural inconsistencies that hinder practical training. Similarly, water supply is adequate in some centres but unreliable in many others, affecting hygiene, attendance, and water-dependent courses.

Sewage facilities present the most severe gap, with both trainees (61.2%) and instructors (67.3%) reporting major inadequacies, raising health, safety, and environmental concerns. Training equipment and machines show a near-even split: 45.6% of trainees are satisfied and 44.6% are dissatisfied, while most instructors (54.6%) believe the equipment is outdated or insufficient. Instructional materials follow a similar pattern: 46.9% of trainees are dissatisfied, and only 38.7% are satisfied, while instructors remain more critical.

Overall, the interpretation suggests infrastructure in CVETCs is inconsistent, inadequately maintained, and unevenly distributed. These gaps undermine practical learning, reduce training quality, and limit employability outcomes. The findings reinforce global evidence from UNESCO, WHO, and the World Bank that basic infrastructure, modern equipment, and reliable utilities are essential for effective technical and vocational training. Strengthening water, sanitation, power, equipment, and learning resources is therefore crucial for improving equitable access and enhancing trainee skill acquisition across Makueni County's CVETCs.

4.1Summary of Findings

The study investigated the role of training facilities and equipment provided by the Makueni County Government in enhancing trainee skill acquisition in County Vocational Education and Training Centres (CVETCs). The findings reveal that while the County Government has made efforts to provide essential infrastructure, gaps remain in critical areas.

Regarding sanitation, 53.4% of trainees reported that toilet facilities were adequate; however, 61.2% of instructors expressed dissatisfaction, indicating inconsistent maintenance and equity across CVETCs. Adequate sanitation is crucial for health, attendance, and effective learning, especially for female trainees.

Regarding utilities, a majority of trainees (60.1%) reported a reliable power supply, yet 52.8% of instructors disagreed, highlighting structural inconsistencies that affect practical sessions in ICT, engineering, and other technical disciplines. Similarly, 52.3% of trainees and 50.9% of instructors rated water services as adequate, while a significant proportion remained dissatisfied, indicating disparities in access and maintenance.

Sewage facilities were widely reported as inadequate, with 61.2% of trainees and 67.3% of instructors dissatisfied. This reflects serious gaps in basic infrastructure, with implications for hygiene, health, and overall learning environments.

Regarding training equipment, 44.6% of trainees and 54.6% of instructors reported that machines, tools, and instructional materials were inadequate or obsolete, limiting hands-on learning and alignment with industry standards. Only 40% of instructors acknowledged donations of machinery and equipment, suggesting gaps between policy and actual implementation.

Digital infrastructure also showed significant deficiencies. Over 64% of trainees and 82% of instructors reported unreliable internet services, while 51.3% of trainees and 72.7% of instructors rated ICT laboratories as inadequate. These deficiencies restrict access to digital learning, e-resources, and modern technical skills.

Challenges in facility maintenance and utilization further impact skill acquisition, with outdated equipment and insufficient consumables identified as major barriers. Overall, the findings reveal a mixed picture: while some institutions benefit from targeted investments, widespread disparities and infrastructural gaps limit the overall effectiveness of technical training in Makueni County.

5. Conclusion

Based on the findings, it can be concluded that the Makueni County Government has made strides in providing essential training infrastructure and equipment; however, significant gaps remain that hinder uniform skill acquisition across CVETCs. Disparities in sanitation, water, electricity, ICT infrastructure, training equipment, and instructional materials indicate that some institutions are under-resourced. The inadequacy of sewage facilities, inconsistent power and water supply, outdated equipment, and unreliable internet access negatively impact practical training, learning outcomes, and employability. The study confirms that investments in training facilities must be consistent, equitable, and well-maintained to enhance the quality of technical education and align graduates' skills with labour market demands.

6. Recommendations

The County Government should prioritize the maintenance and equitable provision of sanitation, water, and power facilities across all CVETCs, including the development of sewage systems, solar power backups, and reliable water sources.

Investments should be made to upgrade training equipment, machines, tools, and instructional materials. Regular audits and replacement schedules are recommended to ensure that resources remain modern and industry-relevant.

Reliable internet connectivity and well-equipped ICT laboratories should be established in all CVETCs to support e-learning, digital literacy, and modern technical skill acquisition. Partnerships with technology providers may help achieve this goal.

Establish transparent systems to facilitate and coordinate donations of machinery and equipment, ensuring equitable distribution and maximum impact.

Implement a robust monitoring and evaluation framework to track the adequacy, utilization, and maintenance of facilities and equipment. This would ensure sustainability and inform future interventions.

Provide training for instructors on the effective use of modern equipment and digital tools to enhance teaching quality and the delivery of practical skills.

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