

Determinants of a Responsive TVET Sub-sector in Addressing Youth Employment Skills Needs in Kenya

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Abstract

The evolution of Technical and Vocational Education and Training (TVET) in Kenya has been historically shaped by colonial policies that marginalized African learners and relegated them to manual labour roles. In contemporary Kenya, the enactment of the TVET Act (2013) marked a pivotal shift by emphasizing the development of technical and professional competencies across economic sectors to enhance graduates' lifelong employability. This study investigated the critical determinants of a responsive TVET sub-sector that effectively meets the employment skills needs of Kenyan youth. Grounded in Dale's Cone of Experience theory, the study adopted a descriptive survey design. A total of 650 participants were selected through simple random sampling, comprising 300 TVET principals, 300 trainers, and 50 graduates. Data collection involved the use of structured questionnaires and interview schedules. Quantitative data were analyzed using descriptive statistics, while qualitative responses were subjected to thematic analysis. The findings identified several key determinants of responsiveness, including the presence of qualified instructional staff, sufficient funding, alignment of curricula with evolving labour market demands, integration of modern technologies, and the relevance of TVET programs to industry needs. The study concluded that without continuous technological upgrades and demand-driven reforms, the TVET sub-sector risks becoming misaligned with youth employment imperatives. It is recommended that the national government increase investment in the TVET system to bolster its capacity to equip youth with market-relevant skills.

Keywords: TVET, employment skills, youth, responsiveness, Kenya, determinants, technical education

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1.0. Introduction

1.1. Contextual Background

Technical and Vocational Education and Training (TVET) encompasses a diverse range of structured learning experiences tailored to equip individuals with practical competencies relevant to specific occupations and the broader labor market. These experiences take place in multiple contexts, including formal institutions, non-formal community settings, and workplaces, thereby offering learners multiple pathways to acquire both foundational and specialized skills (Abagi & Ogachi, 2014; UNESCO, 2016). TVET is globally recognized as a crucial mechanism for enhancing employability, fostering entrepreneurship, and supporting national economic agendas—particularly in low- and middle-income countries where formal employment opportunities are limited (Afeti, 2018).

In the Kenyan context, the origins of TVET trace back to 1911 with the establishment of the Department of Education under British colonial rule, which initially focused on producing a semi-skilled African workforce to

serve colonial economic interests (Orodho, 1984; Ngure, 2022). During this colonial period, technical and vocational education was primarily delivered by Christian missionary organizations and colonial government institutions. These entities offered training in trades such as masonry, carpentry, mechanical work, tailoring, and agriculture, with the primary intention of meeting the labor demands of settler economies rather than promoting African advancement (Sifuna & Sawamura, 2010; Orodho, 2025).

Following independence in 1963, the Kenyan government sought to indigenize and expand the TVET sector. However, the post-independence era was characterized by administrative fragmentation, with responsibility for TVET spread across multiple ministries and agencies. This led to inconsistencies in curricula, variations in certification standards, and a general lack of coordination in policy and implementation (Abagi & Ogachi, 2014; Orodho, 1984). Such structural weaknesses hindered the sector's ability to respond effectively to labor market signals and evolving technological trends.

The enactment of the TVET Act No. 29 of 2013 marked a significant policy shift aimed at restructuring and revitalizing the sector. The Act established key regulatory and quality assurance bodies, including the Technical and Vocational Education and Training Authority (TVETA) and the Curriculum Development, Assessment and Certification Council (CDACC), with mandates to oversee institution registration, curriculum development, assessment, and certification. Moreover, the creation of the Kenya National Qualifications Authority (KNQA) was intended to promote comparability of qualifications and facilitate lifelong learning (Mugo, 2018; Ministry of Education, 2019). These reforms were informed by national development frameworks such as Vision 2030 and the Medium-Term Plans (MTPs), which emphasize TVET as a strategic pillar for youth empowerment and industrial transformation.

Despite these comprehensive reforms, youth unemployment continues to pose a significant challenge in Kenya. Current labor statistics reveal that a large proportion of TVET graduates remain unemployed or underemployed, primarily due to a persistent mismatch between the competencies imparted in training institutions and the dynamic needs of the job market (Kilemi, 2020; World Bank, 2021). Employers often cite deficiencies in soft skills, digital literacy, and technical adaptability among graduates as barriers to employability. Furthermore, the perception of TVET as a second-tier option relative to academic education continues to undermine enrollment and societal support (Oketch, 2007).

To address these gaps, a more responsive and industry-linked TVET system is essential. This requires the active participation of industry stakeholders in curriculum co-design, expansion of apprenticeship programs, investment in modern training infrastructure, and enhanced capacity-building for trainers (UNESCO-UNEVOC, 2020). Policies that promote innovation, green skills, and entrepreneurship within TVET curricula can also enhance the system's relevance in a rapidly transforming economic environment. Ultimately, bridging the skills mismatch will demand sustained political will, cross-sector collaboration, and a learner-centered approach to technical and vocational training.

1.2 The State of the Art Review

The literature is prolific in justifying the determinants of a responsive TVET sector in relation to employability (Abagi & Ogachi, 2014; Orodho, 2025). Key areas of focus include the effectiveness of trainers (UNESCO-UNEVOC, 2020), capacity building for institutional leadership (MOEST, 2012), and strategic enrollment policies (Abagi & Ogachi, 2014). Other documented determinants are curriculum reforms aligned with industry needs (KEPSA, 2024), the implementation of government recommendations (Hezron, 2023), alignment with labor market demands (FKE, 2023), and the promotion of gender inclusivity and equality (Orodho, 2025).

A study by UNESCO-UNEVOC (2020) on innovation and trainee effectiveness noted that the effectiveness and credibility of Technical and Vocational Education and Training (TVET) programs are deeply anchored in the caliber and competencies of the trainers tasked with imparting skills to learners. Trainers serve as the linchpin between policy objectives and actual implementation in training institutions. Their ability to deliver quality, industry-relevant content significantly influences learner outcomes, institutional performance, and overall sectoral contribution to national development goals (UNESCO-UNEVOC, 2020; Njuki, 2023; Orodho, 2023). In essence, the trainer's pedagogical knowledge, technical proficiency, and industry exposure collectively determine the success or failure of TVET reforms (Orodho, 2022).

The demand for a well-qualified TVET teaching workforce has been further underscored by rapid shifts in technology and the evolving dynamics of the labor market. As industries adopt automation, artificial intelligence, and digital platforms, TVET trainers must also adapt through continuous professional development (CPD) to align with these advancements. Retooling and upskilling—via short courses, specialized training, and academic advancement—are necessary to bridge the technological divide and prepare trainees for the contemporary workplace (African Union, 2021). Without structured and regular CPD programs, TVET instructors risk becoming obsolete, leading to a mismatch between training and employer expectations (ETF, 2020).

In Kenya and other Sub-Saharan African countries, professional development for TVET trainers is increasingly being institutionalized through national and regional programs. For example, Kenya's Ministry of Education has partnered with global and local stakeholders to organize regular in-service training, including workshops, boot camps, and practical exposure in industry. These initiatives help trainers acquire emerging technical skills, integrate competency-based education and training (CBET) frameworks, and implement learner-centered pedagogies (Muoria, 2023; TVETA, 2022). Moreover, the participation of TVET educators in global events such as *World Youth Skills Day* and UNESCO-UNEVOC's *International TVET Learning Forums* has broadened the scope of knowledge-sharing and professional networking.

Despite these efforts, challenges persist. Many TVET institutions, particularly in rural or underserved areas, lack the resources to consistently provide CPD opportunities. Additionally, disparities in trainer qualifications and the absence of a harmonized professional development framework hinder uniform quality delivery across institutions (Ndiritu & Waithaka, 2022). Addressing these challenges requires sustainable investment in capacity-building, policy incentives for trainer development, and stronger public-private partnerships to facilitate industrial attachment and mentorship programs.

In nutshell, the professional development of TVET trainers is a non-negotiable cornerstone of effective vocational education systems. As Kenya aims to transform its human capital and achieve inclusive industrial growth under Vision 2030 and the Bottom-Up Economic Transformation Agenda (BETA), investing in trainer quality and continuous development must remain a strategic priority.

Studies on Capacity Building for Institutional Leadership (MOES,2012,2024) contends that beyond trainers, the capacity of TVET institution leaders, including principals and board members, significantly influences the responsiveness of the sub-sector. Effective leadership ensures the implementation of quality training programs and fosters partnerships with industry stakeholders. Capacity-building programs targeting institutional leadership can enhance strategic planning, resource mobilization, and quality assurance mechanisms (Ministry of Education, Science and Technology [MOEST], 2012).

Historically, some TVET institutions in Kenya enrolled students with minimal academic qualifications, which limited the progression and employability of graduates (Abagi & Ogachi, 2014). Implementing strategic enrollment policies that attract qualified and motivated students can enhance the quality of training outcomes. Additionally, providing clear pathways for academic and professional advancement within the TVET system can make the sector more appealing to prospective students and their families.

Studies on Curriculum Reforms and Industry Linkages by KEPSA (2024) counsels that regular updating TVET curricula to reflect the dynamic needs of the labor market is essential for maintaining relevance. The integration of competency-based education and training (CBET) models, which emphasize practical skills and industry involvement, has been instrumental in aligning training programs with employer expectations (KEPSA, 2024). Dual training programs, combining classroom instruction with hands-on industry experience, have proven effective in bridging the gap between education and employment (KEPSA, 2024).

Hezron (2023) avers that Government-appointed task forces and commissions have provided valuable insights into enhancing the TVET sector. The Presidential Working Party on Education Reforms (PWPER) in 2022 recommended periodic curriculum reviews, establishment of industry advisory committees, and increased industry representation in TVET governance structures (Hezron, 2023). Implementing these recommendations can strengthen the alignment between TVET programs and labor market needs(Orodho,2022).

Engaging with employers to understand their skill requirements is critical for developing responsive TVET programs. The Federation of Kenya Employers (FKE) conducted a survey revealing high demand for skills in information technology, finance, engineering, and logistics (FKE, 2023). Notably, employers also emphasized the importance of soft skills such as communication, critical thinking, and teamwork. Incorporating these competencies into TVET curricula can enhance the employability of graduates.

The availability of modern training facilities and equipment is fundamental to delivering quality technical education. TVET institutions require well-equipped laboratories, workshops, and learning materials to provide hands-on experience. Adequate funding is necessary to maintain and upgrade infrastructure, procure training materials, and support student services (Gachuhi & Otieno, 2023).

Incorporating life skills and entrepreneurship training into TVET programs can prepare students for diverse career paths, including self-employment. Emphasizing competencies such as problem-solving, adaptability, and digital literacy equips graduates to navigate the complexities of the modern workforce (IDinsight, 2022).

On effective Management and Coordination of TVET the (MOEST,2004,2024) notes that centralized management of the TVET sector under a dedicated state department has improved coordination and standardization of training programs. This structural reform facilitates the implementation of national policies, quality assurance measures, and strategic partnerships, thereby enhancing the overall responsiveness of the sub-sector (MOEST, 2004).

Promoting gender equality within TVET institutions ensures that all youth have equitable access to training opportunities. Implementing gender-responsive curricula, providing safe learning environments, and addressing socio-cultural barriers can increase female participation in technical fields traditionally dominated by males (Abagi & Ogachi, 2014).

1.3 Statement of the Problem

Despite significant investments and reforms in Kenya's TVET sector, a substantial proportion of graduates continue to face unemployment or underemployment. The persistent mismatch between the skills imparted by TVET programs and the evolving demands of the labor market undermines the sector's potential to address youth unemployment. While initiatives such as dual training programs and curriculum reforms have been introduced, challenges remain in their implementation and scalability. Furthermore, limited industry involvement in curriculum development, inadequate infrastructure, and insufficient emphasis on soft skills contribute to the sub-sector's limited responsiveness. Addressing these issues requires a comprehensive understanding of the determinants influencing the effectiveness of TVET programs in meeting employment skills needs.

This study aims to investigate the factors that determine the responsiveness of Kenya's TVET sub-sector to the employment skills requirements of its youth. By identifying and analyzing these determinants, the research seeks to inform policy and practice, ultimately enhancing the capacity of TVET institutions to equip graduates with market-relevant skills and reduce youth unemployment.

1.4. Research Objectives

1.4.1. Objective One:

To examine the relevance and alignment of TVET curricula with current labor market demands in Kenya. The objectives are:

1. Determine the extent TVET curricula in Kenya reflect the current skill demands of key economic sectors?
2. Examine the mechanisms that exist for involving industry stakeholders in curriculum development and review?
3. Assess how the frequency at which TVET curricula is revised to match emerging labor market trends?

1.4.2. Research Questions:

2. To what extent do TVET curricula in Kenya reflect the current skill demands of key economic sectors?
3. What mechanisms exist for involving industry stakeholders in curriculum development and review?
4. How frequently are TVET curricula revised to match emerging labor market trends?

1.5. Theoretical Framework

This study is anchored in *Kolb's Experiential Learning Theory* (1984) and supported by *Dale's Cone of Experience* (1960), both of which emphasize the importance of concrete experiences and active learner engagement in effective skills development—core tenets of Technical and Vocational Education and Training (TVET). Kolb's Experiential Learning Theory posits that meaningful learning occurs through a four-stage cycle: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. Within the TVET context, this model provides a robust framework for understanding how learners acquire and apply skills in practical settings. Learners begin with hands-on tasks (e.g., metalwork, carpentry, ICT modules), reflect on their experiences, develop generalized principles, and subsequently apply their knowledge in real-world contexts. This cycle is highly aligned with Kenya's competency-based curriculum (CBC) reforms in TVET, which prioritize learning-by-doing and demand real-world problem-solving skills among graduates.

Complementing this is Dale's Cone of Experience, a visual and conceptual model of instructional strategies that categorizes learning activities from the most abstract (verbal symbols) to the most concrete (direct purposeful experiences). Dale (1960) argued that learners retain more information when they are actively involved in their learning using multiple senses. In TVET environments, the Cone underscores the pedagogical value of demonstrations, hands-on practice, simulations, and modeling, reinforcing Kolb's emphasis on experiential learning. This theory informs the study's emphasis on the availability and use of audiovisual aids, training equipment, physical infrastructure, and digital tools, all of which enhance learner retention and skill mastery.

Together, these theories frame the study's investigation into the quality of training environments, the adequacy of learning resources, and their collective influence on youth skills development, retention, and transition into employment. They provide a basis for evaluating how effectively TVET institutions in Kenya are enabling learners to internalize and apply vocational skills through rich and varied learning experiences. Furthermore, the framework supports the hypothesis that resource adequacy, relevant pedagogy, and learner engagement significantly influence training outcomes in the sector.

2.0. Research Design and Methodology

2.1. Research Design

This study adopted a *mixed methods explanatory sequential research design*. The design begins with a *quantitative phase*, followed by a *qualitative phase* to explain and contextualize the numerical findings. This approach is particularly appropriate for policy-relevant educational research where statistical patterns must be interpreted within real-world contexts (Creswell & Plano Clark, 2018). The quantitative component will identify relationships between institutional practices and employability outcomes. The qualitative component will provide in-depth insights from TVET stakeholders to deepen understanding of the mechanisms behind these patterns.

2.2. Research Paradigm

This study is grounded in the *pragmatic paradigm*, which emphasizes the centrality of the research problem over allegiance to a particular methodology. Pragmatism supports methodological pluralism, allowing researchers to draw from both quantitative and qualitative traditions to arrive at practical solutions (Tashakkori & Teddlie, 2003; Orodho, et al,2016). In the context of assessing the responsiveness of the TVET sub-sector to youth employment skills needs—a complex and multi-layered issue—this paradigm is especially appropriate. It enables the researcher to synthesize statistical generalizations with experiential insights to better inform policy and practice (Orodho, 2017).

2.3. Target Population and Sampling

Quantitative Phase

The *target population* comprises all TVET institutions in Kenya registered under the Ministry of Education. Within these institutions, the study focused on *principals, instructors, and final-year students* as respondents, representing administrative, instructional, and learner perspectives, respectively. A stratified random sampling technique was employed to capture institutional diversity across different categories: national polytechnics, technical training institutes, and vocational training centers spread across Kenya's regions. This stratification ensures that the sample is representative of the broader TVET landscape. *Cochran's formula* (1977), adjusted for finite population sizes, will be used to calculate an adequate sample size that balances statistical power with logistical feasibility.

Qualitative Phase

The *qualitative component* involved purposively selected participants, including TVET principals, curriculum experts from agencies such as TVETA, and employers from key industry sectors. The rationale for *purposive sampling* was to engage information-rich cases—individuals with direct experience in curriculum design, industry partnership models, and graduate training outcomes (Patton, 2015). This will ensure depth and contextual insight into systemic challenges and best practices.

2.4. Data Collection Methods

Quantitative Data Collection

Structured questionnaires were administered to respondents during the quantitative phase. These instruments were developed from existing literature on TVET performance, curriculum alignment, and graduate employability, and will undergo expert validation and pilot testing to ensure clarity and reliability. Key constructs to be measured included: Trainer qualifications; Curriculum relevance and frequency of review; Availability and adequacy of training infrastructure; Strength of industry linkages and Indicators of graduate employability.

Qualitative Data Collection

For the qualitative phase, semi-structured interview guides were used to elicit nuanced stakeholder perspectives. Interview questions will explore systemic barriers, curriculum responsiveness, alignment with labour market

trends, and institutional strategies for enhancing youth employability. This flexible approach allowed for probing and adaptation during interviews to capture rich, contextual insights (Orodho,2009,2017).

2.5. Data Analysis

Quantitative Analysis

Quantitative data will be analyzed using descriptive statistics (means, frequencies) to profile institutional characteristics and stakeholder demographics. Inferential statistics, including regression analysis and ANOVA, will assess relationships between independent variables (e.g., trainer quality, industry collaboration, curriculum frequency) and the dependent variable—TVET responsiveness to labour market needs.

Qualitative Analysis

A thematic analysis approach following Braun and Clarke's (2006) six-step framework was applied. Transcripts were coded systematically to identify patterns and themes that reflect key issues in curriculum reform, responsiveness, and institutional capacity. These emergent themes were aligned with relevant theoretical constructs, such as human capital development and systemic adaptability.

Integration of Findings

Triangulation occurred during the interpretation phase. The integration of quantitative trends and qualitative themes enabled convergence or divergence analysis, thereby enhancing the credibility and depth of the study's conclusions. This mixed methods design was consistent with the pragmatic paradigm's emphasis on comprehensive understanding (Creswell & Plano Clark, 2018; Orodho, et al,2016).

2.6 Ethical Considerations

Ethical approval was obtained from the National Commission for Science, Technology, and Innovation (NACOSTI). All participants were fully informed about the study's purpose, procedures, and their rights, including confidentiality and voluntary participation. Informed consent will be secured prior to data collection. Data was anonymized during analysis and reporting, and securely stored in accordance with ethical research standards (Israel & Hay, 2006; Orodho, Nzabwirwa, Odundo, Waweru, & Ndayambaje, 2016).

2.6. Justification:

Curriculum relevance is a cornerstone of any responsive TVET system. In Kenya, persistent youth unemployment coexists with unmet industry demand for skilled labor, suggesting a misalignment between training and market needs. This objective sought to bridge that gap by identifying curricular bottlenecks and institutional responsiveness. Understanding curriculum-industry linkage mechanisms most likely guided reforms to ensure that graduates possess skills that employers value, thereby improving labor market outcomes (Afeti, 2018; UNESCO, 2021)

3.0 Findings and Discussion

This section presents data in line with the objectives of the study, namely the extent TVET curriculum in Kenya reflects the current skills demand; mechanisms of involving stakeholders; and the frequency of reviews of the TVET curricula.

3.1 Extent TVET Curriculum in Kenya Reflects the Current Skill Demand

The examination of the alignment of TVET curricula with current labour market demands in Kenya revealed both opportunities and critical gaps. Findings indicated that TVET curricula, although conceptually designed to meet sector-specific skills needs, are frequently outdated and overly theoretical. Approximately 90% of TVET graduates interviewed perceived their training as largely irrelevant to current labour market requirements, with limited exposure to hands-on, industry-based skills. This gap reflects a broader challenge in curriculum responsiveness and highlights an ongoing mismatch between training and practical job demands (Republic of Kenya, 2016).

One critical dimension that emerged is the dual training model, which integrates theoretical instruction with industry-based practical experience. Encouragingly, a few institutions have begun piloting this approach, in which trainees receive 50% classroom-based training and 50% industrial experience. This model holds promise for improving skills alignment and addressing criticisms of inadequate exposure to the world of work. Expansion of such models should be prioritized and institutionalized across all TVET institutions (Muoria, 2023).

Another major issue was trainers' workload. It was found that 70% of TVET trainers were teaching between 21 to 30 lessons per week, while 30% covered more than 30 lessons. This overwhelming workload has adverse implications for instructional quality and trainer burnout. The Public Service Commission (PSC) had initiated a recruitment plan for over 2,000 additional trainers to alleviate the strain, but implementation appears uneven. In several institutions, Boards of Management (BOMs) hired supplemental trainers at their own cost, revealing systemic inequities in resource allocation and sustainability.

The availability of course books and learning materials also remains inadequate. Despite policy intentions to increase textbook grants (Republic of Kenya, 2016), many students rely solely on trainers' notes or sporadic internet access, with minimal access to standardized course books. The implications for content delivery and learner outcomes are significant, particularly in technical disciplines where precise, up-to-date materials are vital.

Digital resource provision presents a similarly uneven landscape. Although a national computer supply programme was initiated (Republic of Kenya, 2011), only 40% of sampled institutions had operational computer labs, and even these often housed obsolete machines. A few students with personal laptops or smartphones managed limited access to online materials, but systemic gaps in digital literacy training remain. Moreover, some institutions restrict computer use based on course relevance, contradicting national goals of equipping all youth with digital competencies.

The availability and quality of physical infrastructure—especially laboratories and sanitation facilities—were found to be variable. While 90% of institutions reported having adequate lavatories and laboratories, disparities

in quality were stark, particularly between rural and urban centres. As UNICEF (2000) emphasized, such disparities affect learner health, dignity, and the quality of practical instruction.

Admission practices were also found to be inconsistent. Historically, some institutions admitted learners without standardized qualifications, a practice linked to previous fragmentation in governance across ministries. The creation of the State Department of TVET and TVETA has since introduced greater regulation and standardization, enhancing the attractiveness of TVET among prospective trainees, including university graduates. This institutional reform has also helped elevate the status and demand for TVET programmes (MOEST, 2012).

Capacity building for trainers remains a serious concern. 90% of trainers reported receiving no formal professional development between 2021 and 2023, with only 10% having participated once or twice in that period. Given the rapidly evolving labour market, this lack of ongoing training undermines the sector's ability to remain relevant and responsive. Yet global best practices recognize the centrality of continuous professional development to high-quality vocational training (TVETA, 2023).

3.2. Mechanisms for Involving Stakeholders in Curriculum Development and Review

Stakeholder engagement in curriculum development and review is a vital process that enhances the relevance, responsiveness, and inclusivity of education systems. The involvement of a broad spectrum of stakeholders—including teachers, learners, parents, curriculum experts, community representatives, policymakers, and industry partners—ensures that curricular content reflects societal needs, contextual realities, and future aspirations (UNESCO, 2017). In many educational contexts, particularly in low- and middle-income countries such as Kenya, the mechanisms for stakeholder engagement are often formalized through consultative forums, policy dialogues, needs assessments, and piloting of draft curricula prior to implementation (Oduor et al., 2021).

One of the most prominent mechanisms for stakeholder participation is the establishment of curriculum review panels or taskforces that incorporate representatives from diverse sectors. These bodies are typically mandated to collect input through public participation forums, focus group discussions, expert panels, and structured feedback mechanisms (KICD, 2019). For example, in Kenya's Competency-Based Curriculum (CBC) reform process, the Kenya Institute of Curriculum Development (KICD) actively involved stakeholders through national validation workshops, public submissions, and teacher training programs, which collectively influenced curriculum design and rollout (Nderitu, 2020).

Moreover, digital platforms and mass media have increasingly been adopted as mechanisms to broaden stakeholder reach and engagement. Through online surveys, televised discussions, and social media campaigns, educational authorities can solicit widespread feedback from previously underrepresented or marginalized groups (Mwangi & Wambugu, 2022). This democratization of curriculum discourse is particularly crucial in contexts where disparities in voice and access may otherwise marginalize critical stakeholders such as persons with disabilities, indigenous communities, and rural populations.

At the school level, Boards of Management (BOMs), Parent-Teacher Associations (PTAs), and student councils provide localized platforms for curriculum input. These grassroots mechanisms help contextualize national

curricula to local needs by highlighting issues such as language of instruction, cultural relevance, and resource appropriateness (Wanjala & Nyaga, 2018). Teachers, in particular, play a central role not only in implementing the curriculum but also in shaping its review through structured professional feedback loops, school-based curriculum implementation reports, and participation in lesson study groups (Sifuna & Otiende, 2020).

However, despite the existence of these mechanisms, meaningful stakeholder engagement is often hindered by top-down decision-making, limited capacity, and tokenistic consultation practices. Genuine involvement requires institutional frameworks that support continuous dialogue, build stakeholder capacity for informed input, and provide feedback loops to ensure contributions are reflected in final curriculum documents (Ball & Tyson, 2011). Strengthening these mechanisms necessitates not just procedural inclusivity but also a shift in power relations to allow co-creation and shared ownership of the curriculum reform agenda.

In sum, the mechanisms for involving stakeholders in curriculum development and review are multifaceted and evolving. While significant progress has been made—particularly in participatory policy design and technology-enabled consultations—greater investment is needed to institutionalize inclusive, equitable, and context-sensitive curriculum processes. These mechanisms are crucial not only for fostering educational quality but also for promoting social accountability and ownership among all actors within the education ecosystem.

3.3. Frequency of TVET Curriculum Revisions to Match Labour Market Trends

The alignment of Technical and Vocational Education and Training (TVET) curricula with dynamic labour market trends is fundamental to equipping learners with relevant, employable skills and enhancing national competitiveness. Ideally, TVET curriculum revisions should be responsive, regular, and informed by real-time labour market intelligence. However, the frequency and effectiveness of such revisions vary significantly across countries and are often constrained by institutional, political, and financial limitations.

In many developing countries, including Kenya, formal TVET curriculum reviews tend to occur at intervals of five to ten years—a timeframe that is arguably too slow given the rapid technological and industrial shifts impacting labour demands (Afeti & Adubra, 2012). For instance, despite efforts by the Kenya National Qualifications Authority (KNQA) and the Curriculum Development Assessment and Certification Council (CDACC) to introduce Competency-Based Education and Training (CBET), many training institutions still operate under outdated syllabi that inadequately reflect current workplace practices (UNESCO-UNEVOC, 2020). The slow pace of revision results in a persistent skills mismatch, where graduates are trained for roles that no longer exist or for which demand has significantly diminished (Wakiaga, 2021).

Moreover, the existing revision frameworks are often rigid and bureaucratic. While the establishment of industry-led sector skills councils was envisioned to drive faster, more targeted updates, their operationalization has been inconsistent and under-resourced (Yoto & Tareke, 2019). Even when curriculum updates occur, they tend to be superficial, focusing on content changes rather than pedagogical renewal or integration of soft skills and emerging technologies such as AI, green energy, or digital platforms (Manda et al., 2020). As a result, the revisions lag behind the evolution of job markets, especially in sectors like ICT, manufacturing, and creative economies that require constant curricular adaptability.

Compounding this challenge is the limited use of labour market information systems (LMIS) in informing curriculum revisions. In Kenya, while LMIS infrastructure exists under agencies such as the Kenya National Bureau of Statistics (KNBS) and the Ministry of Labour, the data is often fragmented, outdated, or not effectively translated into actionable curricular reforms (ILO, 2018). Without robust feedback loops between employers, training institutions, and policymakers, curriculum revisions remain reactive rather than proactive, compromising the capacity of TVET systems to serve as engines of inclusive economic growth.

A more responsive TVET curriculum model would entail continuous modular review processes, stakeholder co-creation, and real-time integration of labour market forecasting. Such models are evident in countries like Germany and Singapore, where dual training systems and strong industry-academia linkages facilitate curriculum updates every 1–3 years, anchored in demand-driven intelligence (OECD, 2019). These countries also invest in teacher retooling and industry placements to ensure that trainers remain abreast of evolving industry standards—a practice still weakly embedded in many African TVET ecosystems.

In a nutshell, while Kenya and similar contexts have made commendable efforts to institutionalize TVET curriculum reform, the frequency and depth of revisions remain insufficient to keep pace with fast-changing labour market trends. Bridging this gap requires not only more frequent updates but also more agile, evidence-based, and participatory approaches that prioritize relevance, adaptability, and foresight.

4. Conclusion and Recommendations

4.1 Conclusions

The findings from this study underscore a critical truth: the responsiveness of the TVET sub-sector in Kenya to youth employment skills needs is heavily dependent on dynamic curriculum development processes, inclusive stakeholder engagement, and timely alignment with labour market trends. While policy strides such as the adoption of Competency-Based Education and Training (CBET) and establishment of regulatory bodies like KNQA and CDACC have laid a solid institutional foundation, structural gaps persist. Curriculum content often trails technological and industrial innovations, and stakeholder engagement mechanisms—though present—are not always meaningful or sustained. Furthermore, curriculum revision cycles remain infrequent, failing to reflect the rapid evolution of job markets.

For TVET to serve as a transformative pathway for addressing youth unemployment and underemployment in Kenya, it must transcend periodic reforms and evolve into a system that is continuously adaptive, industry-led, and innovation-driven. A truly responsive TVET sub-sector must function not only as a transmitter of technical skills but as an incubator for lifelong learning, entrepreneurial thinking, and resilience in an increasingly fluid labour market.

4.2 Key Actionable Recommendations

1. *Institutionalize Real-Time Labour Market Intelligence (LMI) into TVET Curriculum Cycles:* The Ministry of Education, in collaboration with KNBS and the private sector, should strengthen and digitize Labour Market Information Systems (LMIS) and mandate their integration into TVET curriculum reviews. This would ensure data-driven, frequent, and future-focused curriculum updates—

- ideally every 2–3 years—tailored to emerging skills needs across key sectors such as digital technology, green energy, manufacturing, and the creative economy.
2. *Formalize and Deepen Stakeholder Engagement through Sector Skills Councils Operationalize* and empower sector-specific skills councils comprising industry experts, employers, trainers, and youth representatives to co-create curricula, assess training standards, and conduct regular skills forecasting. Their involvement must go beyond token consultations to shared decision-making and quality assurance roles, thus ensuring relevance and ownership across all stakeholders.
 3. *Embed Flexible, Modular, and Micro-Credential Learning Pathways: Transition* the TVET curriculum architecture towards a modular and stackable system that allows learners to acquire and update skills incrementally through short courses, apprenticeships, and digital micro-credentials. This flexibility will enable youth to remain employable, especially in the gig economy and rapidly changing work environments.
 4. *Invest in Capacity Building and Industry Exposure for TVET Trainers: Establish* mandatory continuous professional development (CPD) programs for TVET instructors, including structured industry attachments, exposure to emerging technologies, and pedagogical retraining. Empowering trainers with current industry knowledge will enhance instructional quality and better prepare graduates for the demands of modern workplaces.

These strategic recommendations are not only grounded in the findings of this study but are essential levers for transforming TVET into a responsive, inclusive, and future-ready engine of youth employment in Kenya.

5 Further Research

While this study provides critical insights into the determinants of a responsive TVET sub-sector in addressing youth employment needs in Kenya, several areas remain underexplored. Future research could employ longitudinal designs to assess the long-term employability and career progression of TVET graduates across different regions and economic sectors. Additionally, comparative studies between public and private TVET institutions or between urban and rural contexts could yield nuanced understandings of institutional disparities. Research focusing on the integration of emerging technologies (e.g., digital tools, AI, and green technologies) in TVET curricula and their alignment with evolving labor market demands is also recommended. Finally, there is a need for participatory action research involving learners, trainers, and employers in co-developing responsive and inclusive training models.

6 Conflict of Interest

The author(s) declare *no potential conflicts of interest* with respect to the research, authorship, or publication of this study. The research was conducted independently, with no financial, institutional, or personal interests that could have influenced the results or interpretation of the findings.

7 Limitations

This study, while methodologically robust, acknowledges several limitations. First, logistical challenges in accessing remote and under-resourced TVET institutions may limit the generalizability of findings to the entire

national landscape. Second, the reliance on self-reported data from institutional heads, instructors, and students may introduce social desirability bias, particularly concerning perceptions of employability outcomes and curriculum relevance. Third, the cross-sectional design of the study does not allow for causal inferences or tracking of graduate outcomes over time. Lastly, the scope was confined to formal, registered TVET institutions under the Ministry of Education, thereby excluding informal and non-accredited training providers that nonetheless play a role in skills development.

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