

POLICY BRIEF

# Building TVET Systems for Economic Transformation in Rwanda: Challenges and Policy Options

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## Overview

Africa's youthful population—particularly in Sub-Saharan Africa, where 70 percent are under the age of 30—presents a unique and powerful opportunity for economic growth and innovation. To harness this potential, technical and vocational education and training (TVET) plays a critical role by equipping young people with practical skills necessary for employment, entrepreneurship, and industry engagement. TVET supports both formal and informal learning pathways, including vocational schools, apprenticeships, and on-the-job training, making it a vital tool for addressing youth unemployment and closing the persistent skills mismatch across the continent. Although TVET systems are globally recognized and increasingly integrated into national development agendas, their effectiveness depends heavily on adequate investment, curriculum modernization, teacher capacity development, and inclusive policies that ensure equitable access for all youth (ACET, 2023).

Despite TVET's potential, systems across Africa face major challenges, including inadequate infrastructure, outdated curricula, a lack of qualified and practically experienced instructors, weak industry links, and limited employer involvement in shaping training programs. TVET remains stigmatized in many regions as a “second-rate” option for students seen as academic underachievers (ILO, 2020). Additionally, chronic underfunding and restricted accessibility disproportionately affect vulnerable groups such as women, rural youth, and persons with disabilities (Gahima, 2024).

Rwanda has integrated TVET into both secondary and tertiary education through various institutions, including vocational training centers, technical secondary schools, integrated polytechnic regional centers, and private providers. The government introduced a competency-based curriculum in 2015 and innovative programs such as Mass Vocational Training, Rapid Response Training, workplace learning, and industrial attachments. Despite these efforts, the system faces challenges related to a shortage of technical institutions, inadequate digital and physical infrastructure, outdated curricula

and insufficient training in emerging fields, limited teacher training, and unequal access based on gender, geography, and disability.

### ***About the multi-country study***

This policy brief assesses how effectively Rwanda's TVET systems are preparing youth for the Fourth Industrial Revolution (4IR) and evaluates the responsiveness and effectiveness of TVET in equipping young people with future-ready skills. It is derived from a broader regional study conducted in partnership with the Mastercard Foundation, *Building TVET Systems for Economic Transformation in Africa*, a multi-country initiative spanning six African nations: Côte d'Ivoire, Ghana, Ethiopia, Niger, Rwanda, and Uganda.

Using a mixed-methods approach, the study combined desk reviews and field surveys to assess how well TVET systems are adapting to meet the evolving demands of 4IR. The desk review analyzed national and international policies, strategies, and relevant literature to provide contextual grounding and guide the development of data collection tools. Primary data were collected through structured questionnaires tailored to various stakeholder groups, as well as in-depth interviews conducted with key informants, including government officials, regulatory bodies, development partners, educators, students, parents, private sector actors, and civil society organizations (CSOs). A total of 636 participants contributed to the research, providing a comprehensive and nuanced understanding of Rwanda's TVET landscape and its readiness to equip youth with the skills needed for success in the 4IR era.

## **Findings**

This section examines how existing policy frameworks position TVET as a catalyst for industrial development and economic transformation in Rwanda. It explores ongoing efforts to integrate informal sector training into the formal TVET system, an essential step given the large number of youth employed in the informal economy. It also evaluates the presence and effectiveness of skills forecasting mechanisms intended to align training with labor market demands. Additionally, the section assesses coordination mechanisms among key stakeholders, including government institutions, the private sector, development partners, and civil society. Finally, it reviews the extent to which clear national benchmarks and a focused TVET research agenda are in place and identifies research topics of interest for improving TVET.

### ***National TVET policy and implementation***

Rwanda's National Development Plan, guided by Vision 2020, Vision 2050, and the National Strategy for Transformation, prioritizes inclusive economic and social development through quality education and workforce development. Central to this effort is the expansion of TVET, led by the Ministry of Education. By adopting competency-based training, Rwanda ensures that learners gain practical, job-ready skills aligned with labor market needs. Key policies emphasize digital innovation, advanced manufacturing, and science, technology, engineering, and mathematics. The introduction of the Competency-Based Curriculum in 2015 and the National Skills Development Policy in 2016 further support Rwanda's goal of preparing a skilled workforce for the 4IR.

Rwanda has adopted several national policies to align education with labor market needs and promote skills for economic growth. Key among them is the TVET Strategic Plan (2019–2024), which

focuses on improving training quality, revising curricula, and strengthening public-private partnerships (PPPs). The National Employment Program (2014–2019) aimed to bridge skills gaps and connect TVET graduates with job opportunities; the National Youth Policy (2016) promotes youth participation in TVET with a focus on gender equality and 4IR readiness. The National Skills Development and Employment Promotion Strategy (2019–2024) emphasizes PPPs to build responsive, innovative, and sustainable TVET systems (RDB, 2019). The Private Sector Development and Youth Employment Strategy (2018–2024) prioritizes entrepreneurship training to empower youth as drivers of economic transformation (PSDYE Sector Working Group Secretariat, 2018).

Vision 2050 positions Rwanda as a knowledge-based economy, with TVET playing a key role in preparing the workforce for technological innovation and global competitiveness (Republic of Rwanda, 2020). The strategy emphasizes industry involvement in curriculum development, capacity building, and on-the-job training, while promoting innovation, entrepreneurship, inclusivity, and gender equity in TVET. The Rwandan government supports TVET through infrastructure development, land provision, and seed funding, complemented by private sector investments in facilities, equipment, and technology.

Involving industry experts in program design helps ensure graduates acquire market-relevant skills. Although most TVET head teachers are familiar with national policies and strategies, many struggle to align institutional practices with national goals, particularly in establishing industry partnerships for internships and work-based learning. Private institutions especially report difficulties in fully understanding policy details, and many academic staff lack digital skills, hindering the use of modern teaching methods.

To address these issues, respondents recommended policy reforms that incentivize private sector engagement and promote industry involvement in all phases of TVET development. They emphasized the need for regular curriculum updates, upgraded training facilities, continuous instructor development, and expanded internship opportunities. Stakeholders agreed that a collaborative approach, integrating both public and private sector strengths, is essential for building a responsive, inclusive, and future-ready TVET system that meets the demands of the 4IR and drives Rwanda's economic transformation.

### ***TVET alignment with national industrial development plans***

Rwanda's National Strategy for Transformation (NST1) 2017–2024 emphasizes social transformation by developing a skilled workforce through improved access to quality education, with TVET at the core (Republic of Rwanda, 2019). The Education Sector Strategic Plan (2018–2024) promotes Competency-Based Training and Assessment, now coordinated by the Rwanda TVET Board for improved sector governance. Although TVET institutions expressed mixed views on alignment with national industrial plans, the National Skills Development Policy (2016) supports labor market-responsive training, particularly in preparation for the 4IR. Policymakers highlighted the National Employment Program (2014–2019), which enhances employability through job creation, work-based learning, and industry partnerships. Initiatives like the Graduate Employment Program help TVET graduates acquire practical, job-ready skills, strengthening Rwanda's competitive, future-ready workforce.

Despite the comprehensive framework provided by the TVET Strategic Plan, implementation challenges remain. Many institutions suffer from underfunding, limiting investments in modern infrastructure, updated equipment, and qualified instructors. A skills gap persists between TVET curricula and labor market demands, and weak monitoring and evaluation systems hinder effective

assessment and adaptation of programs. Although respondents recognize national industrial development plans, financial constraints are a major barrier to fully aligning TVET programs with industry needs.

### ***Attributes of success***

**Strong private sector involvement in TVET.** On average, about 90 percent of respondents rated private sector involvement in the training and assessment of TVET learners as a key attribute, with institutions, students, teachers, and CSOs rating it particularly high.

**Collaboration between educational institutions and industry.** Overall, 87.5 percent of respondents ranked the co-creation of training programs as important, but 100 percent of institutions ranked it as a key attribute. This result highlights the importance of multistakeholder collaboration, especially between institutions and industry, to align TVET curricula with labor market needs.

**Job-ready training and transition to employment.** On average, 83.5 percent of respondents ranked this attribute as important, with institutional heads, students, CSOs, and teachers ranking it particularly highly. These results emphasize the widespread endorsement of job-readiness, with a need to strengthen the roles of regulatory bodies and the private sector in improving employment transitions.

**Flexibility in pathways to tertiary education.** Flexible articulation pathways and progression routes to TVET (ranked as important by 73.5 percent of respondents) were particularly valued by students, teachers, CSOs, institutional heads, parents, and the private sector. Only 65 percent of regulatory bodies, however, ranked this attribute highly.

**Emphasis on science, technology, engineering, and mathematics (STEM) education.** This attribute received high ratings from institutional heads (93.95 percent), teachers (89.77 percent), students (88.24 percent), and CSOs (88.24 percent). It was ranked lower by the private sector, parents, and regulatory bodies; however, at least 50 percent of each of these groups ranked it as a key attribute. These results reflect a widespread recognition of STEM's importance for preparing students for future careers.

### ***Challenges and how to address them***

Rwanda faces major challenges in achieving these key attributes, including weak collaboration between academia and the private sector, and unclear policy frameworks. UNESCO Beirut (2019) stresses that effective skills forecasting is vital to reduce labor market mismatches, especially the rising demand for soft skills among graduates. These challenges underline the urgent need to strengthen Rwanda's skills anticipation systems to better connect education with employment opportunities.

A practical solution to addressing skills mismatches is the establishment of labor market information systems, which gather and analyze data on employment trends, skills demand, and workforce demographics. These systems offer valuable insights into current and future skills needs through ongoing employer surveys and feedback. Benefits of these systems include enabling educational institutions and training providers to design programs aligned with labor market demands and reducing mismatches between workforce skills and employer needs.

Understanding the mechanisms for forecasting skills needs, shortages, and gaps across various economic sectors requires comprehensive labor market analysis. This analysis is crucial for aligning

TVET programs with real labor market demands. It relies on key supply-side indicators such as demographic trends, the number of school leavers, unemployment rates, and qualification profiles to identify current and future workforce requirements.

To address the need for effective skills forecasting, policymakers and regulatory bodies underscore the importance of strong collaboration among the private sector, TVET instructors, and government institutions. These partnerships are essential for identifying the competencies and qualifications employers require across different industries. Policymakers participating in this study also emphasized the value of comprehensive needs assessments that involve diverse stakeholders. Such assessments enable education and training providers to align their programs with both current and emerging labor market demands. They further noted that skills shortages often arise from an insufficient supply of workers with the right expertise. Therefore, accurate skills forecasting is crucial for setting training and education priorities to bridge these gaps.

Private sector respondents echoed these concerns, pointing to a significant skills gap in Rwanda that must be addressed to support economic development and competitiveness. To improve alignment between TVET and market needs, employers stressed the value of forecasting skills demand, enabling timely adjustments in curricula, teaching methods, and certification standards. They also advocated for district-specific training programs tailored to local economic strengths, for instance, leveraging Musanze's competitive edge in tourism and agriculture to develop relevant skills for its labor market.

Heads of TVET institutions emphasized that labor market data are essential not only for understanding current skill demands but also for forecasting future trends, enabling programs to prepare students for emerging job opportunities. Analyzing demographic trends, school leavers, unemployment rates, and qualification profiles helps align TVET curricula with market needs, reducing skills gaps and supporting sustainable economic growth. However, some TVET institutions reported lacking effective mechanisms or government communication for skills anticipation, revealing a significant gap in coordinated skills forecasting and underscoring the urgent need for improved collaboration and information-sharing between government bodies and TVET institutions to better align training with evolving labor market demands.

The skills forecasting process in Rwanda incorporates gender analysis, examining women's and men's participation across sectors and identifying barriers to women's involvement, especially in male-dominated trades like plumbing, mechanics, and construction. Although government policies promote gender equality—evident in Rwanda's female-majority parliament—CSOs pointed to persistent cultural and financial obstacles limiting women's full participation in TVET. The study also highlights limited collaboration between TVET institutions and the private sector, which hinders apprenticeships and internships critical for practical training.

### ***Key players and priorities***

**Mechanisms for stakeholder coordination.** Rwanda's TVET policy emphasizes the importance of stakeholder coordination, highlighting collaboration among public institutions, the private sector, development partners, and educational institutions to align training with national economic goals (MINEDUC, 2015). In Rwanda's TVET sector, coordination and cooperation among stakeholders are facilitated through the implementation of PPPs (Jembere, Hybano, and Jonsson, 2023). The study reveals mixed perceptions about the effectiveness of coordination within Rwanda's TVET system. Table 1 presents the views of different stakeholders regarding the mechanisms for stakeholder coordination within Rwanda's TVET system.

**Table 1. Mechanisms for stakeholder coordination, summary of responses**

Mechanism	Stakeholder group(s)	Yes	No
Effective tools for stakeholder coordination	Policymakers	56.5%	43.5%
Promotion of gender quality in TVET	CSOs	41.2%	58.8%
TVET benchmarking with other countries	Government officials	35.3%	64.7%
Advocacy for TVET system improvement	CSOs	47.1%	52.9%
Interest in identifying suitable TVET benchmarking areas	All respondents	14.7%	85.3%
TVET system benefits from sharing of successful African approaches	All respondents	58.8%	41.2%
Strong collaborative efforts between CSOs and development partners to support education	CSOs, development partners	75.8%	24.2%

Source: IPAR-Rwanda TVET survey data, 2024.

These findings highlight several areas that require attention for improving the effectiveness and impact of Rwanda's TVET system. For example, the disagreement over the effectiveness of coordination mechanisms points to a need for strengthening partnerships and communication among stakeholders. The mixed views on gender equality promotion suggest that civil society's role in promoting gender equality in TVET could be enhanced. The lack of active benchmarking and limited awareness about international best practices indicate that Rwanda may benefit from increasing its engagement in global TVET benchmarking to improve its system. Furthermore, the discrepancies in perceptions about government advocacy for TVET improvements suggest that more concerted efforts are needed to promote and advocate for TVET development, especially among CSOs. Also, the positive views on successful African approaches suggest that Rwanda could further leverage regional best practices to strengthen its TVET system.

**Private sector engagement.** Private sector involvement in TVET is essential for promoting collaboration, driving innovation, and ensuring the long-term sustainability of the system. Partnerships between businesses, government, and TVET learners play a critical role in building a dynamic, responsive workforce that meets the evolving demands of the labor market. Consequently, the government has prioritized the promotion of an entrepreneurial mindset—not only to prepare individuals for formal employment but also to equip them with the skills needed to create their own economic opportunities. This section explores the insights gathered from government officials, regulatory bodies, TVET institution leaders, teachers, students, private sector representatives, and CSOs regarding the role of the private sector in TVET.

According to respondents, the private sector plays a vital and multifaceted role in strengthening Rwanda's TVET system. Over 90 percent of respondents highlighted its key contributions, including defining core competencies and occupational standards, revising qualification frameworks, and participating in hands-on training, ensuring that TVET programs remain relevant to industry needs and enhance graduate employability. Private businesses are also actively involved in evaluating student competency, shaping policy through advisory boards, providing up-to-date industry information, and supporting staff training.

Among the different groups of respondents, TVET institutions identified five main private sector roles: setting occupational standards, engaging in advisory councils, updating qualifications, supporting apprenticeships and internships, and offering career guidance. By contrast, most CSOs were unaware of how TVET adapts to changing industry demands, limiting their engagement.

Government respondents highlighted several ways to enhance private sector involvement in TVET. These include defining core competencies and occupational standards, supporting apprenticeship and internship programs, funding staff training for TVET institutions, providing up-to-date information on evolving workplace skill demands, and organizing job fairs to connect students with employment opportunities. Rwanda draws lessons from countries with strong vocational models like Germany and Korea but acknowledges the need to strengthen PPPs, especially to improve in-company and apprenticeship training quality. At the same time, private sector employers seek greater involvement in certification, assessment, curriculum development, cooperative training, and technology transfer.

**Guidelines for benchmarking national TVET systems.** Several international frameworks guide TVET development and benchmarking. For example, the International Labour Organization stresses the need to strengthen African TVET systems to meet labor market demands and support inclusive growth (ILO, 2020). The United Nations Educational, Scientific and Cultural Organization emphasizes aligning TVET with global best practices through improved curricula, teacher development, and relevance to the labor market. The European Training Foundation offers vocational training institutions a tool for self-assessment. By leveraging these guidelines and tools, Rwanda can strengthen its TVET system, better prepare its graduates, and contribute significantly to national economic growth and development.

In gathering insights from government officials, regulatory bodies, TVET leaders, and CSOs, the study found mixed perceptions. Government respondents generally agreed that Rwanda engages in international benchmarking to align its TVET system with global standards. However, some development partners expressed uncertainty or disagreement about the extent of these benchmarking efforts.

**Research topics for the development of Rwanda's TVET system.** Respondents identified several critical research gaps that reflect lessons from countries like China, Germany, Japan, Kenya, Nigeria, Singapore, Tanzania, and Uganda. These nations offer valuable examples in tackling skills mismatches, fostering economic growth, and promoting social inclusion through effective TVET strategies. Countries like Kenya and Nigeria focus on enhancing industry-education partnerships, whereas Tanzania and China address competency-based education and training implementation challenges and digital training innovations. Germany and Japan offer successful models of dual education and strong quality assurance systems. Gender inclusivity and governance are critical, with studies from Kenya, Nigeria, and Tanzania providing strategies to increase female participation and improve stakeholder coordination.

Survey responses for this study identified six major research topics that are of significant interest and would directly benefit Rwanda's national TVET system: (i) promoting TVET programs and curricula; (ii) fostering collaboration with investors and the private sector; (iii) enhancing technology, including the use of robotics in industries; (iv) encouraging parents to enroll children in TVET education and changing negative perceptions of TVET; (v) motivating female participation in TVET programs; and (vi) establishing sustainable mechanisms for skills development.

## Recommendations

TVET systems play a crucial role in economic transformation by equipping individuals with skills for employment, entrepreneurship, and innovation. They help address skills gaps, promote inclusive growth, and enhance productivity in emerging economies. But Rwanda's system faces several challenges related to quality of education, infrastructure, and preparedness. Despite government efforts, employers often express concerns about TVET graduates' competencies. To support Rwanda's socioeconomic growth, TVET systems must improve to better prepare graduates for the labor market. The study recommends the following priority actions.

### **Align TVET programs with labor market needs.**

Curricula must be regularly updated to reflect the evolving demands of the labor market, especially in relation to 4IR-related needs. Doing so requires close collaboration with industry players in designing, delivering, and assessing training to ensure relevance and responsiveness. Broad stakeholder engagement, including educational institutions and community organizations, is vital to foster ownership and improve program effectiveness.

### **Strengthen public-private partnerships.**

Private sector involvement in TVET must be increased; examples include active participation in skills councils, internships, mentorships, and equipment donations. To encourage business engagement, the government should offer financial incentives like tax breaks and grants. This collaboration enhances program quality and labor market relevance.

### **Develop a strong TVET financing strategy.**

A comprehensive funding framework should be established to provide TVET institutions with the necessary infrastructure, equipment, and qualified educators. Investment in both physical and digital resources is essential to keep pace with technological advancements and industry needs.

### **Provide tax incentives and financial support for businesses.**

Tax incentives and exemptions on duties for training equipment (supported by 97 percent of respondents) can reduce financial barriers for companies contributing to TVET. Additionally, tax breaks for firms hiring TVET graduates encourage the employment of skilled workers, bridging the gap between education and labor market integration.

### **Invest in infrastructure and technology.**

Bridging the digital divide will require significant investment in physical and digital infrastructure, particularly in rural and underserved areas. Expanding tech-based courses such as coding, data analysis, and e-learning platforms prepares students for future job markets.

### **Align TVET with national development goals.**

TVET must be central to Rwanda's Vision 2050, equipping a skilled workforce for sectors driving economic growth. Adequate funding and strategic program design are critical to meeting national targets like employment growth, poverty reduction, and sustainable development.

### **Promote gender equality and inclusivity.**

Implementing gender-responsive policies, subsidies, and community programs will encourage participation from women, rural populations, and persons with disabilities. Efforts should focus on inclusive training environments and breaking down traditional gender barriers in technical fields.

### **Tailor training programs to local and regional needs.**

TVET curricula should be customized to match the specific needs of each district, emphasizing sectors such as agriculture, mining, tourism, and fisheries. Doing so ensures relevance to local economies and supports regional comparative advantages.

### **Offer recognition and visibility for private sector contributions.**

Awarding companies for their involvement in TVET initiatives creates incentives and raises their profile in the market, fostering a culture of corporate social responsibility and competitive advantage.

### **Support vulnerable groups through vocational training centers.**

Targeted support to marginalized groups—including women, rural communities, and persons with disabilities—will reduce labor market inequalities and bolster inclusive development.

### **Improve communication and collaboration with CSOs.**

Strengthening partnerships between TVET institutions and CSOs to address communication gaps, resource limitations, and priority differences will improve program effectiveness and stakeholder engagement.

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