ACET African Center for Economic Transformation

Institute of Policy Analysis and Research - Rwanda

In partnership with mastercard foundation

Building TVET Systems for Economic Transformation in Africa:

RWANDA COUNTRY REPORT

BACKGROUND PAPER

The Rwanda Country Report is part of the Building TVET Systems for Economic Transformation in Africa study, jointly implemented by ACET and think tanks in six African countries: Côte d'Ivoire, Ethiopia, Ghana, Niger, Rwanda, and Uganda. The study builds on earlier work by ACET in partnership with the Mastercard Foundation on secondary education in Africa and focuses on how national TVET systems can better respond to changing labor market demands and drive inclusive economic transformation. The objective of the study is to identify and map the key challenges facing the TVET sector across the six countries and to highlight promising practices and actionable policy recommendations. The country reports informed the study's synthesis report, available to read and download at acetforafrica.org/TVET.

Contents

Abbreviations

4IR	Fourth Industrial Revolution
CSO	civil society organization
EV	electric vehicle
ICT	information and communication technology
NSDEPS	National Skills Development and Employment Promotion Strategy
NST1	National Strategy for Transformation
RTB	Rwanda TVET Board
STEM	science, technology, engineering and mathematics
TVET	technical and vocational education and training

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Disclaimer

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Executive Summary

This study aims to assess the preparedness of Rwanda's technical and vocational education and training (TVET) systems at the secondary education level in responding to labor market demands, with a particular focus on aligning with the skills required for the Fourth Industrial Revolution and fostering economic transformation. The study also helps policymakers identify TVET system limitations and explore its transformative potential in the Fourth Industrial Revolution era. By addressing these critical questions, the research contributes to informed decision-making and strategic policy interventions to prepare Rwanda's youth for future challenges and opportunities. Rwanda's growing youth population makes restructuring TVET essential to align with current labor market demands and future expectations. To ensure that TVET programs remain relevant and valuable to the job market, curricula must evolve to equip learners with the skills demanded by contemporary employers.

The study highlights significant inadequacies in foundational skills among both young men and women, emphasizing the urgent need to enhance early education and strengthen science, technology, engineering, and mathematics skills to better prepare students for vocational training. Key TVET challenges include under trained educators, limited funding, and curricula misalignment with labor market needs, leaving graduates unprepared for jobs. Improving TVET effectiveness will require aligning curricula with labor market demands and strengthening foundational skills. Collaboration with industry in creating training programs is essential to ensure that curricula address real-world needs. Moreover, active private sector involvement in training and assessment brings valuable industry expertise.

Further challenges in adapting TVET to Rwanda's evolving labor market stem from inadequate physical and digital infrastructure. Gaps in essential resources, such as equipment and learning materials, negatively affect the quality and relevance of TVET programs. Limited access to technology, particularly for disadvantaged students from rural or lower-income backgrounds, exacerbates these issues, hindering students' ability to benefit from remote learning and essential digital tools. Addressing these infrastructure challenges is critical to ensuring that TVET remains responsive to labor market demands and accessible to all students.

An evaluation of stakeholders' awareness of mechanisms designed to adapt TVET systems to changing industry demands reveals a significant communication gap. A large proportion of respondents (64.7%) reported being unaware of these adaptation mechanisms, underscoring the need for improved communication and better understanding of how TVET programs are evolving. In contrast, only 35.3% were aware of these mechanisms. This lack of awareness could hinder the effectiveness of TVET programs, because students, educators, and other stakeholders may not be fully informed about the resources, updates, or reforms aimed at improving the system. Bridging this gap will require strengthening outreach, improving communication strategies, and actively engaging stakeholders in the development and reform of TVET programs. Doing so would ensure that all parties involved have the necessary information to contribute effectively to the evolution of vocational education and meet the needs of a rapidly changing job market.

Further findings underscore the critical role of the private sector in enhancing TVET. A key recommendation is to establish industry skills and standards through collaboration between businesses and educational institutions in updating and integrating the new 21st century skills into the curriculum. Ensuring that TVET programs remain relevant and maintain high-quality standards requires feedback from industry stakeholders. Private sector involvement in skills councils, reported by 70% of respondents, allows companies to influence the direction of TVET institutions. Furthermore, the same proportion of respondents noted that staying informed about industry trends helps TVET institutions keep pace with technological advancements, better preparing students for the job market.

To encourage greater private sector participation in TVET, the study suggests the use of government-backed financial incentives, such as tax breaks or grants, as essential motivators. These incentives reduce barriers for businesses to invest in TVET, making it more appealing for companies to offer training, provide internships, or donate equipment. Simplifying collaboration processes and regulations, noted by 98.04% of respondents, is also crucial. Streamlined procedures can facilitate partnerships between businesses and educational institutions, fostering increased private sector involvement in TVET initiatives.

Building effective collaborations with TVET institutions is equally important, because companies can actively shape the training of future employees, creating mutually beneficial outcomes for both employers and students. Respondents highlighted several challenges in implementation, including the need for foundational skills catch-up programs and coordination mechanisms for funding TVET initiatives. The digitalization of TVET curricula is also vital to integrate digital skills and technology, better aligning them with market demands. Addressing skills gaps and ensuring that TVET instructors remain informed about relevant industry developments will necessitate continuous professional development for educators.

To overcome these challenges, TVET institutions must enhance their digital infrastructure and expand technology-based course offerings, such as coding, data analysis, and digital marketing. As artificial intelligence and digital transformation continue to advance, equipping students with essential digital skills will be critical for success in a rapidly evolving job market. Private sector involvement is key to an effective TVET system that promotes collaboration, innovation, and long-term growth. Encouraging an entrepreneurial mindset will empower individuals to not only pursue traditional employment but also create their own opportunities.

The study also examines gender inclusion issues, particularly disparities in access and participation of young women in TVET programs. Key barriers identified included unsafe and non-inclusive training environments (37.14% of respondents), traditional gender roles (25.71%), lack of information and resources (17.14%), and affordability issues (11.43%). These barriers pose significant challenges for women seeking access to technical education and employment, especially in male-dominated fields. Targeted interventions, such as gender-responsive policies, subsidies, and community engagement, are needed to increase women's participation in TVET programs and enhance the inclusion of marginalized groups, ultimately strengthening their contribution to Rwanda's workforce.

In terms of integrating green skills into the TVET curriculum, the study finds a growing emphasis on sustainability in Rwanda's construction industry. The focus on energy efficiency, renewable energy technologies, and sustainable construction techniques equips graduates with the skills necessary to minimize energy consumption and reduce environmental impacts. This shift highlights the importance of integrating green skills into TVET programs to prepare students for a sustainable future in the construction sector.

Regarding collaboration challenges between civil society organizations and the TVET sector, the study identifies issues such as poor communication, limited resources, and bureaucratic obstacles. It also identifies lack of trust and differing priorities between civil society organizations and TVET institutions as significant barriers to effective collaboration. Strengthening partnerships and communication between these sectors is essential for enhancing the TVET system.

Policymakers identified several key challenges hindering TVET's responsiveness to the evolving labor market, including the absence of labor market information, lack of entrepreneurial skills, and limited knowledge on adapting training programs to market demands. Additional barriers include insufficient support for reforms among instructors and resistance to new technologies. Policymakers emphasized the importance of improving labor market information, enhancing governance in the TVET sector, and promoting social inclusion and equity.

To incentivize private sector participation in TVET initiatives, most respondents suggested offering tax rebates for firms supporting TVET programs, waiving import duties on training equipment, and providing recognition awards for active companies. They also identified collaboration between stakeholders and the TVET sector as an effective strategy to boost private sector engagement. Furthermore, the study emphasizes the government's role in strengthening the TVET system through improved labor market information, better governance, and enhanced teacher professional development. Respondents also recognized addressing negative perceptions of TVET, ensuring adequate physical and digital infrastructure, and establishing sustainable funding mechanisms as crucial areas for government focus.

These efforts are essential for building a robust TVET system that can effectively contribute to economic transformation and meet evolving labor market demands. The implications of these findings suggest that private sector involvement in TVET can be significantly increased through a combination of financial incentives, public recognition, and collaborative partnerships, ultimately leading to a more effective and responsive TVET system.

Although study findings show that Rwanda's TVET system plays a crucial role in equipping the workforce with the skills needed for sustainable development and economic growth, they also show a crucial need for a solid TVET financing strategy. Adequate funding directly affects the system's effectiveness, scalability, and ability to meet labor market demands. Study findings indicate that Rwanda's economy is undergoing a transformation with a strong emphasis on sectors such as agriculture, manufacturing, construction, and services. Many study stakeholders, however, highlighted skills mismatches. Because youth unemployment presents a significant

challenge in Rwanda, the best solution is to strengthen the general education system to better equip young people with the skills needed for the job market. However, a strong second-best alternative is to ensure that TVET programs effectively provide skills directly aligned with market demands.

A well-funded TVET system can equip the workforce with relevant technical skills, reducing the skills gap and increasing employment opportunities for youth. Promoting inclusivity would solve the issue of rural-urban divide in terms of access to training. In this way, TVET can serve as a powerful tool for inclusive development, because it offers opportunities to a wider range of people, including those who might not attend traditional academic pathways such as high schools and universities. Vocational training centers ensure that vulnerable groups, including women, rural populations, and people with disabilities, have access to skill development programs.

In terms of alignment with national development goals, Rwanda's Vision 2050 aims to turn the country into a middle-income economy with a highly skilled workforce. TVET is central to achieving these goals because it directly contributes to producing skilled workers for sectors that drive economic growth. Financing TVET is a critical part of ensuring that the system contributes to national development targets such as increasing the employment rate, reducing poverty, and fostering sustainable development.

In a nutshell, tackling the challenges in TVET requires a comprehensive approach, with all stakeholders in education working collaboratively. The government plays a pivotal role in crafting policies that lower financial barriers and ensure that training aligns with industry demands. By adopting these strategies, TVET stakeholders can help close the gap between education and employment, contributing to a more skilled workforce and driving economic growth.

1. Introduction: TVET Overview

1.1. Background

Sub-Saharan Africa's youthful population, 70% under the age of 30, presents a unique opportunity for the continent's growth and innovation. Harnessing this potential will require empowering young people through access to meaningful work and skill development. Technical and vocational education and training (TVET) plays a crucial role in this process, equipping individuals with practical skills and knowledge for various trades and professions. TVET supports youth empowerment and economic transformation by preparing young people for diverse career paths through both formal and informal learning formats, including accredited qualifications, apprenticeships, on-the-job training, non formal workshops, and corporate training initiatives.

The TVET landscape in Africa varies by country, with each adopting different approaches. Ethiopia and Rwanda have integrated TVET into secondary and tertiary education through technical schools, vocational training centers, and technical tertiary institutions. Ghana provides formal TVET programs at both the secondary and tertiary levels, offering structured pathways for skills development. This diverse approach allows TVET to meet different learning needs across the continent, ensuring that young people gain the skills necessary for a rapidly evolving job market (ACET, 2023).

Historically, TVET has been viewed as a second choice or second-rate form of education. In many countries, young people enrolled in TVET programs are often labeled as academic underachievers, which reinforces negative stereotypes and devalues this type of education (MINEDUC, 2015). Enhancing the status and appeal of TVET will require a shift in public attitudes about TVET. Changing these perceptions requires showcasing the positive outcomes that TVET can offer and helping students understand the advantages of pursuing TVET qualifications over traditional academic routes (ILO, 2020).

Rwanda's Vision 2050 aims to turn the country into a middle-income economy with a highly skilled workforce. TVET is central to achieving these goals because it directly contributes to producing skilled workers for sectors that drive economic growth. Financing TVET is a critical part of ensuring that the system contributes to national development targets such as increasing the employment rate, reducing poverty, and fostering sustainable development. OECD (2016a) notes a growing focus on decentralizing power structures of TVET among countries worldwide, as they aim to improve the effectiveness of their vocational education systems, meet increasing economic and social demands, and produce more graduates with relevant skills that align with labor market needs

Rwanda's efforts to decentralize TVET governance—which enhances the relevance, efficiency, and equity of the country's vocational education and training systems—are in line with global trends (Ministry of Education, 2016). Currently, 267 million young people ages 15–24 worldwide are not engaged in any form of employment, education, or training; and women account for only 43% of students enrolled in vocational education at the upper-secondary level, compared to 49% in general education. Notably, 5% of today's global workforce comprises foreign-born workers,

who play an increasingly significant role, and 1.25 billion workers—approximately 38% of the global workforce—are at risk of job loss or displacement (ILO, 2020).

Despite the challenges facing youth in Africa, TVET is recognized as a vital tool for transforming and empowering communities. With ongoing job challenges and a significant skills mismatch between labor market demands and traditional education systems, TVET has become an increasingly important component of national education systems. It is seen as an essential part of any skills development agenda, particularly in addressing youth unemployment and skill gaps, as evidenced by studies such as ILO, 2015. TVET plays a critical role in equipping individuals with the skills needed for success in the workplace. By fostering the development of practical skills and the right attitudes, TVET enhances worker productivity, boosts economic competitiveness, and facilitates occupational integration. It helps individuals increase their income levels and expands their employment opportunities, which contributes to broader socioeconomic development.

The scope of TVET includes a range of learning approaches such as on-the-job training, apprenticeships, vocational secondary schools, sector-specific TVET institutions, and vocational pathways within comprehensive schools. These approaches serve as effective and practical means for skills upgrading, offering diverse opportunities for young people to gain the competencies needed to thrive in the workforce (British Council, 2018; IPA, 2014). TVET's flexibility and relevance make it a critical response to the evolving demands of the labor market. Additionally, TVET is gaining increasing recognition and priority within global education discussions and national development agendas (Marope, Chakroun, and Holmes, 2015). It holds a prominent place in the strategic priorities of entities such as the Association of Southeast Asian Nations, Group of 20, International Labour Organization for Economic Co-operation and Development, Southeast Asian Ministers of Education Organization, and United Nations Educational, Scientific and Cultural Organization. Despite this recognition, realizing the full potential of TVET to drive sustainable development requires ongoing transformation and revitalization, as emphasized in the Shanghai Consensus (UNESCO, 2012).

TVET encompasses a wide range of educational and training programs designed to equip individuals with the practical skills, knowledge, and competencies required for specific trades, crafts, and professions. TVET directly addresses workforce demands by focusing on the development of learning methods and the acquisition of workplace attitudes that contribute to success in professional environments.[1] By enhancing worker productivity and economic competitiveness, TVET plays a key role in promoting occupational integration and expanding employment opportunities. It also helps increase income levels for individuals, thereby contributing to broader socioeconomic development (Ngure, 2013). Through its practical approach to skills development, TVET is vital in preparing individuals for the labor market, fostering economic growth, and improving overall employment outcomes.

[1] United Nations Educational, Scientific and Cultural Organization, "Skills for work and life: Promoting technical and vocational education and training (TVET) for youth and adults," https://www.unesco.org/en/skills-work-life.

Despite ongoing efforts, TVET in Africa continues to face significant challenges in achieving its intended outcomes. Key obstacles include inadequate infrastructure and equipment, along with persistent issues related to the quality and relevance of training programs in the TVET sector. According to World Bank (2017), these challenges include (1) a lack of adequately qualified teachers with practical experience; (2) slow development or absence of training programs for emerging industries that have high demand for skilled workers; (3) an examination system that focuses more on theoretical knowledge than on practical achievements; (4) weak links between TVET institutions and potential employers, leading to a disconnect between training and industry needs; and (5) a lack of institutionalized research that links education to the labor market, limiting innovation and adaptation within the TVET system. Ogunode, Adeniyi, and Ukozor (2024) further emphasize that inadequate funding continues to be a structural issue, which exacerbates the lack of resources available for TVET institutions.

Similarly, the African Union Commission and AUDA-NEPAD (2019) highlight the need for more effective public-private partnerships to enhance the quality and relevance of TVET programs and align them more closely with labor market demands. Additionally, UNESCO (2020) stresses that TVET in Africa faces challenges related to outdated curricula, which do not adequately reflect technological advancements or industry requirements, hindering the system's ability to prepare youth for the rapidly changing labor market. Addressing these issues will be crucial for unlocking the potential of TVET in contributing to Africa's economic growth and development.

Despite the challenges facing TVET at the regional level, Rwanda has made significant progress in its transformative agenda. This progress is particularly evident in the adoption of a competency-based curriculum and innovative vocational training initiatives designed to bridge the skills gap and develop a workforce capable of driving innovation, productivity, and sustainable economic growth. These efforts are especially crucial in the context of the Fourth Industrial Revolution, or 4IR (RDB, 2022). Rwanda has positioned itself at the forefront of economic transformation, focusing on harnessing its human capital to address the challenges and seize the opportunities of the new industrial era. A key aspect of this strategy is the development of a TVET system designed to meet the evolving needs of the economy and equip the workforce with the skills necessary to thrive in the digital age, as outlined in the Rwanda TVET Board Strategic Plan (2021–2024).

In Rwanda, TVET is offered through various avenues, including stand-alone vocational training centers, technical secondary schools, TVET wings within existing secondary schools, and integrated polytechnic colleges. Additionally, private institutions provide both formal and non-formal TVET programs, further diversifying the training landscape. Recognizing TVET's critical role in economic development, the government is actively reforming and modernizing the system. Key innovations include mass vocational training, rapid response training systems, workplace learning, dual learning, and industrial-based attachments. These initiatives aim to equip graduates with the practical skills and competencies required to succeed in the evolving job market, addressing the skills gap and aligning TVET programs with industry needs.

Despite increasing recognition in Rwanda of TVET as essential for addressing the dynamic needs of the workforce, the system currently does not meet the expectations of either employers or learners (Gahima, 2023). Challenges include the limited number of technical institutes, inadequate physical and digital infrastructure, insufficient facilities and materials, a shortage of qualified instructors, and a lack of comprehensive teacher training programs. Additionally, inadequate funding and the slow adoption of digital technologies hinder the modernization of TVET. A skills mismatch between the education system and the labor market exacerbates these issues. This gap in skills development, particularly in developing countries, impedes economic growth and social inclusion, and compromises the quality and effectiveness of TVET programs (Ayonmike et al., 2015; ILO, 2015).

Visits to different TVET schools revealed that young men and women with disabilities face significant challenges because of limited access to technology. These inequalities in access to and participation in TVET create major obstacles, hindering the development of a skilled, diverse workforce capable of driving inclusive economic growth. Additionally, gender imbalances in TVET present a pressing concern, with women and girls notably underrepresented in many fields, particularly in science, technology, engineering, and mathematics disciplines. Moreover, a growing disparity in educational opportunities, resources, and outcomes between students who live in urban areas and those who live in rural areas often includes differences in access to quality schools, qualified teachers, technology, extracurricular activities, and infrastructure. Urban students typically benefit from better educational facilities and more opportunities, whereas rural students may face challenges like limited access to schools, fewer learning materials, less experienced educators, and lack of electricity in some schools. Consequently, rural students may lag behind in academic performance, leading to long-term disadvantages in their personal and professional lives.

1.2. Objectives and approach

Objective of the study. This study offers viable policy and strategic recommendations for policymakers and stakeholders to ensure that TVET education evolves and aligns with the 4IR, enabling TVET to contribute to the country's socioeconomic development. Consequently, the objective of this research is to evaluate the current state of the TVET system in Rwanda and propose policy and strategic interventions and directions to enhance its 4IR readiness.

Analytical framework. The analytical framework highlights 4IR skills and digitalization as central elements in transforming TVET systems, acknowledging their pivotal role in shaping the future of work (refer to appendix A). As industries continue to adopt advanced technologies, automation, artificial intelligence, and digital tools, TVET programs must integrate these innovations into their curricula to ensure that learners acquire the skills necessary for the digital economy. The framework emphasizes the need for both supply-side (education providers) and demand-side (employers) alignment with the digital transformation of industries. On the supply side, it calls for the integration of 4IR-related skills such as data analysis, cybersecurity, digital manufacturing, coding, and artificial intelligence into the TVET curriculum. Such skills ensure

that students are prepared not only for current job market needs but also for the jobs of the future.

On the demand side, the framework encourages collaboration between TVET institutions and employers to identify and respond to emerging skill requirements driven by digitalization. By aligning TVET training with technological advancements, the framework ensures that the workforce remains adaptable and capable of meeting the ever-evolving demands of the labor market. Additionally, the framework underscores the importance of policies and strategies that support digitalization in TVET systems, such as investments in digital infrastructure, teacher training in new technologies, and the promotion of lifelong learning opportunities to equip individuals with ongoing skills development in line with the digital transformation.

Methodology and approach

The study focused on the investigation of TVET systems associated with the 4IR in the country. To achieve its objectives and to address its basic questions, the study considered both qualitative and quantitative as well as primary and secondary data. The basic approach is based on the ACET Policy Engagement Model, and included a desk review and field surveys.

Desk review. The literature review involved an examination of relevant national, regional, and international documents . It provided valuable background and historical insights into TVET issues at the global, regional, and national levels. The review also helped identify key study variables, data types, and sources to be collected, as well as the methods for data collection and analysis. Additionally, it offered important lessons for understanding TVET systems. Review and analysis of various secondary documents related to TVET, including policies, strategies, programs, guidelines, institutional frameworks, annual reports, statistical reports, and others, were conducted to gain an understanding of the current state of the TVET system in Rwanda.

Field survey. The study collected primary data from various actors and stakeholders using well-structured survey questionnaires. These questionnaires included both open and closed questions, designed by ACET for different stakeholder groups and refined through discussions with representatives from the six anchor institutions participating in the study in Accra, Ghana. Interviews conducted alongside the surveys facilitated deeper engagement with key stakeholders. The study conducted interviews with policymakers (government officials), regulatory bodies, development partners in education, TVET teachers, trainers in vocational training centers, public and private universities, private sector representatives, students, parents, and civil society organizations. Table 1 details the respondents who participated in the study.

Table 1. Categories and numbers of survey respondents

Type of respondent	Number
Students	215
Teachers	169
Parents	98
Institutions (head teachers)	35
Civil society organizations	42
Development partners	8
Private sector actors	62
Regulatory bodies	4
Policymakers	3
Total	**636**

Source: IPAR-Rwanda TVET survey data set, 2024.

1.3. Focus of the study

The study conducted an in-depth analysis of the challenges, characteristics, evolution, and roles of key stakeholders in Rwanda's TVET sector. It also examined the policies, strategies, regulations, and institutional frameworks established to strengthen the TVET sector in the country. Overall, the study focused on the following overarching questions:

- What is the existing status of TVET systems in Rwanda? What major challenges affect TVET in Rwanda?
- How are TVET systems responding to the challenges evolved over time in Rwanda?
- How are TVET systems responding to the changing nature of work in Rwanda? What efforts have TVET systems made so far to cope with the 4IR in Rwanda?
- What are the attributes of a TVET system that effectively contributes to economic transformation and young people's transition into dignified and fulfilling work?
- What are the major roles of different actors and stakeholders (particularly, the private sector) and policy changes needed to improve the current TVET systems in Rwanda?
- What lessons can be considered from national, regional, and international experiences (or benchmarking) to improve the existing TVET system in Rwanda?
- What are the appropriate policy and strategy interventions to solve the existing challenges of TVET systems in Rwanda?

1.4. Structure of the report

This country report is organized into five sections. This introduction outlines the study's background, objectives, approach, and focus. It discusses Africa's youth population, the importance of TVET, and the broad challenges and opportunities within the sector.

Section 2 presents an overview of the TVET system in Rwanda, covering the status of national TVET policies and strategies, the alignment of TVET with national industrial development, the integration of informal sector training into the TVET system, and key challenges facing the sector.

Section 3 identifies and discusses the key attributes of a TVET system that supports economic transformation and equips young people with skills for the 4IR. It also addresses skills forecasting mechanisms, challenges hindering the adaptation of the TVET sector to labor market demands, the extent of digitalization within the TVET system, and efforts to incorporate green skills into training curricula.

Section 4 examines the roles of various actors and stakeholders, particularly the private sector; explores mechanisms for stakeholder coordination; and highlights the policy changes and priorities needed to evolve Rwanda's TVET system.

Finally, section 5 consolidates the findings and provides specific, actionable recommendations, including brief but technically detailed descriptions and justifications.

2. Context: The State of TVET in Rwanda

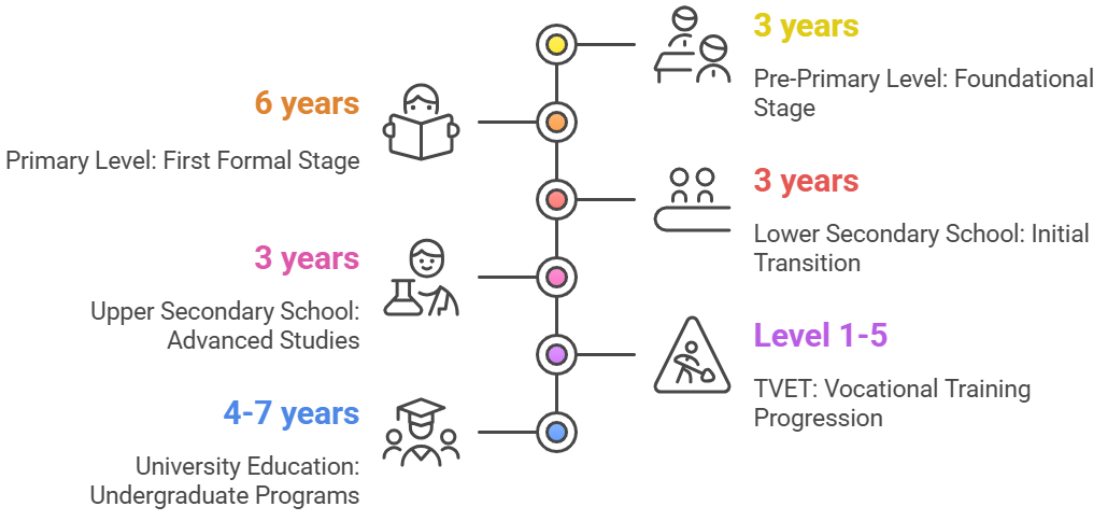
This section explores the present landscape of technical and vocational education and training (TVET) in Rwanda. It outlines the progress made, challenges faced, and opportunities available in the development of TVET programs within the country.

2.1. Overview of the TVET sector in Rwanda

Rwanda's TVET policy, rooted in the 2003 Education Sector Policy, aligns with national and international frameworks such as Vision 2020 and the Millennium Development Goals. The policy aims primarily to equip the economy with a skilled workforce capable of driving sustainable growth and reducing poverty. A range of initiatives and projects have been launched, involving diverse stakeholders to deliver training programs tailored to different groups, including secondary school students, high school graduates, employed and unemployed youth, and individuals unable to continue their education because of various challenges, including those with disabilities and historically marginalized populations.

TVET was established in Rwanda in 2008 with the aim of modernizing and developing the technical workforce to support the country's growth. Various policies—including the TVET Policy of 2008, which was revised in 2015—have shaped the TVET system. Initially, the Workforce Development Authority (WDA) managed TVET; however, following a public service restructuring in 2020, the WDA was dissolved, and the Rwanda TVET Board (RTB) was created as the new governing body. Operating under the Ministry of Education, the RTB is now responsible for overseeing all TVET initiatives, from Level 1 to Level 5 of the Rwanda TVET Qualification Framework (figure 1).

Figure 1. Educational journey through Rwanda's system



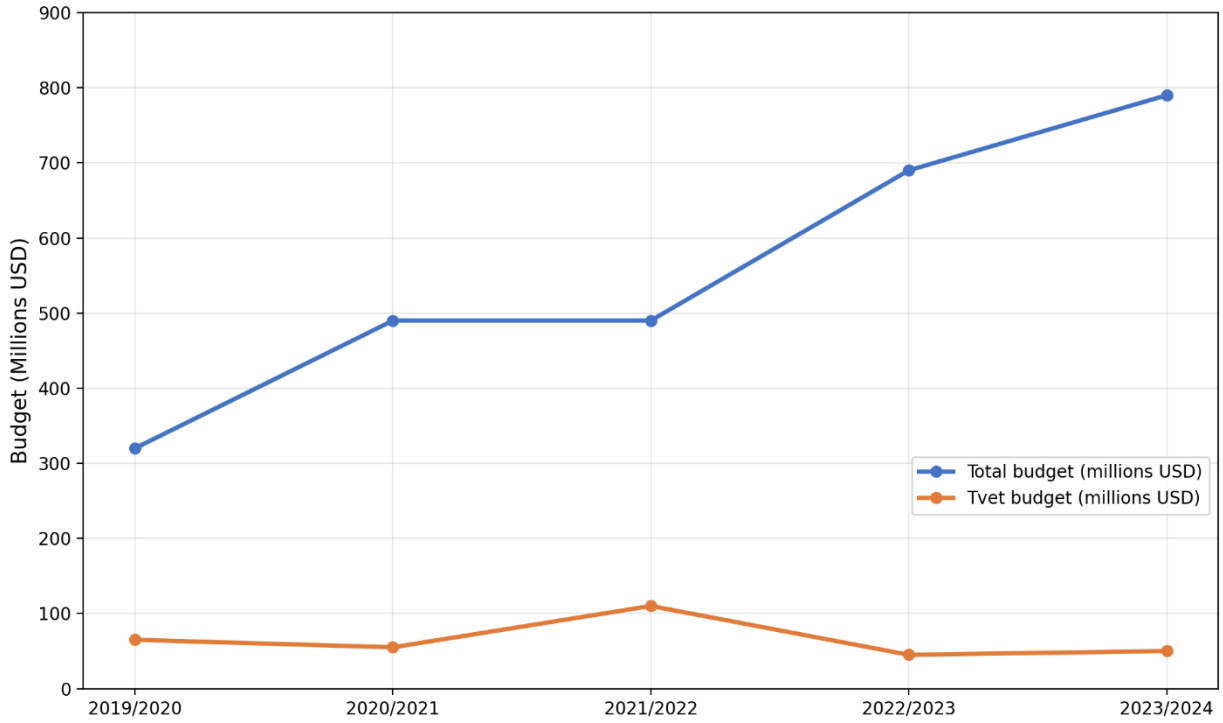
Source: Ministry of Education, 2024 census.

TVET levels are structured to offer a comprehensive progression in vocational skills. Level 1, typically offered through vocational and technical centers, focuses on basic skills. Level 2 provides intermediate skills, preparing individuals for more specialized tasks. Level 3 focuses on advanced skills, equipping learners with expertise for higher-level responsibilities in their chosen trade. Level 4 culminates in a professional diploma. Finally, level 5 offers a bachelor of technology, with which students can specialize in various trades.

By contrast, university education typically includes academic awards, with a four-year bachelor's degree as the standard for many fields of study. Some disciplines, however, such as human medicine, require extended study, with a degree taking up to seven years to complete, depending on the program. This diverse educational pathway ensures that learners can gain both practical technical skills and academic qualifications tailored to their career aspirations.

Education funding has been a key focus in Rwanda's development agenda, with a comprehensive analysis of trends and expenditures between 2019 and 2024 (figure 2). The Ministry of Finance and Economic Planning has allocated millions of US dollars to the education sector, prioritizing investments in the TVET Board. These substantial financial commitments underscore Rwanda's strategic emphasis on education as a critical driver of social and economic transformation. This investment represents not only a response to the immediate needs of the workforce but also a long-term strategy to foster sustainable economic growth and reduce unemployment, thereby contributing to national development goals.

Figure 2. Trends in education expenditure, 2019–24 (US$, millions)



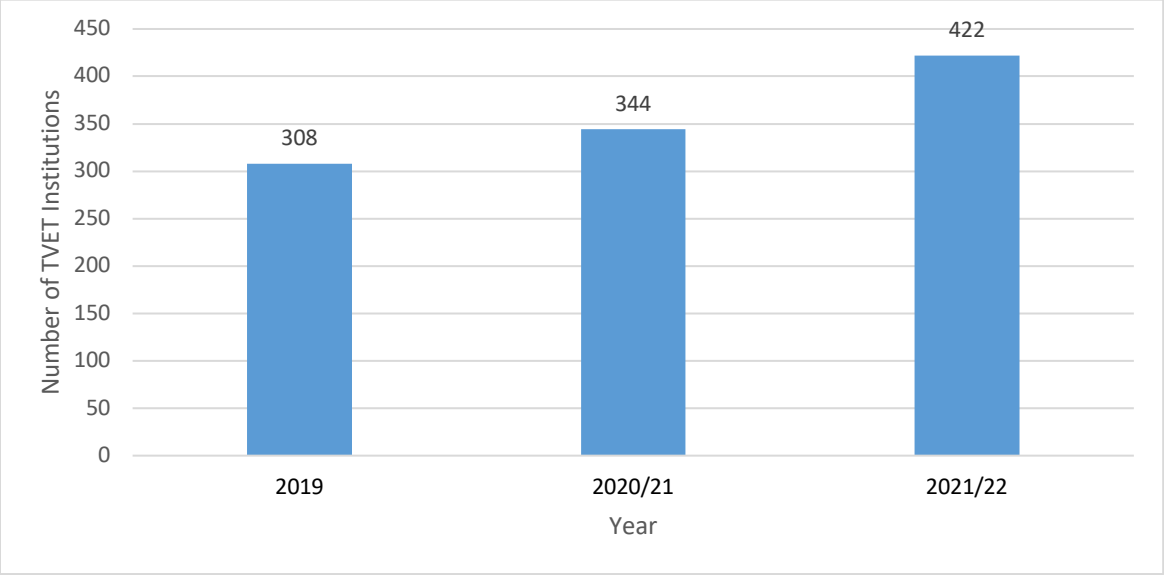
Source: Gahima,(2025)

TVET in Rwanda receives funding primarily from the government. Out of US$ 313.4 million allocated to the Ministry of Education in 2019/20, US$ 65.2 million went to TVET. The budget allocation to TVET institutions decreased noticeably from 2019/20 to 2020/21, followed by a recovery in subsequent years. Despite the fluctuations, the share of the education budget allocated to TVET remained relatively low after 2019/20.

In 2020/21, out of a total education budget of US$ 486.1, US$ 63.8 was allocated to TVET. In the following year, 2021/22, the total education budget increased to US$ 479.9 with US$ 134.000 allocated to TVET. The 2022/23, the budget allocated to the Ministry of Education increased to US$ 675 with US$ 48.9 allocated to TVET. The 2023/24 budget further rose to US$ 786.9 with US$ 54.1 allocated to TVET, marking a 17% increase in TVET's funding. Overall, TVET now accounts for 6.9% of the Ministry of Education's total budget. These allocations demonstrate the government's recognition of the critical role TVET plays in developing skills and addressing labor market shortages, aligning with its broader goal of fostering economic growth and reducing unemployment through skilled workforce development.

The number of TVET institutions has steadily increased over the years. From 308 TVET institutions in 2019/2020 the number grew to 344 in 2020/21. By 2021/22, the total had risen further to 422 TVET institutions, indicating a significant expansion in the sector (figure 3).

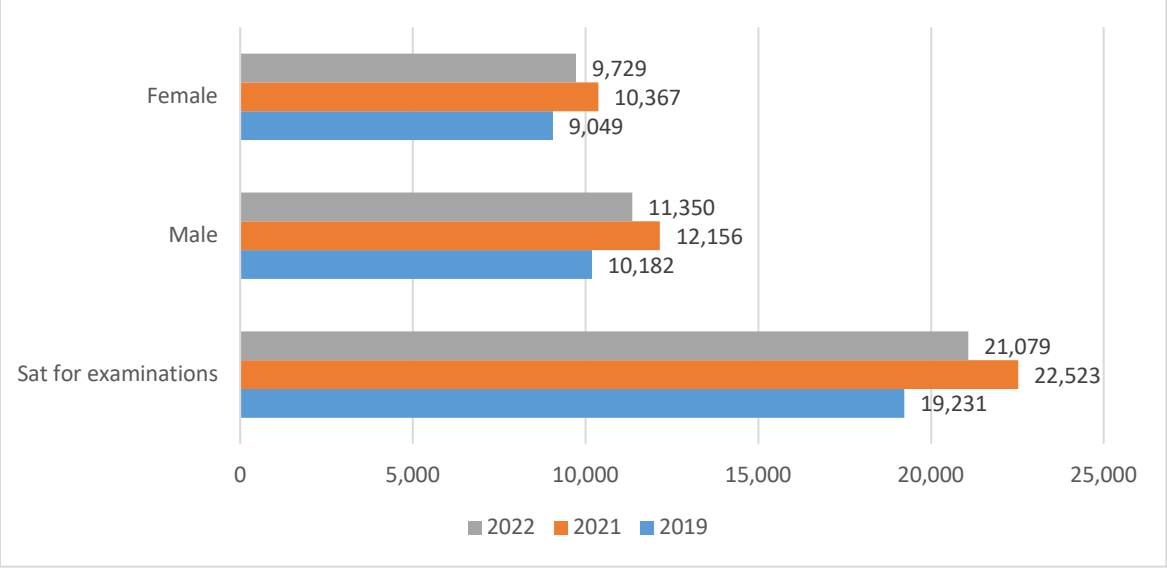
Figure 3. Number of TVET institutions per year, 2019/20 and 2021/22



Source: Ministry of Education, 2024 census.

Figure 4 highlights the trends and disparities in female and male participation in TVET. The figure shows a clear trend over the years: although both male and female participation increased from 2019/20 to 2020/21 and then decreased slightly in 2021/22 male participation remains slightly above female participation. The same pattern holds for the number of candidates sitting for exams. By examining these data, we can observe shifts in gender representation over time, identify areas where gender gaps may still exist, and assess the progress made toward achieving gender equality within the TVET sector.

Figure 4. Number of TVET graduates, by gender, 2019/2020 and 2021/22

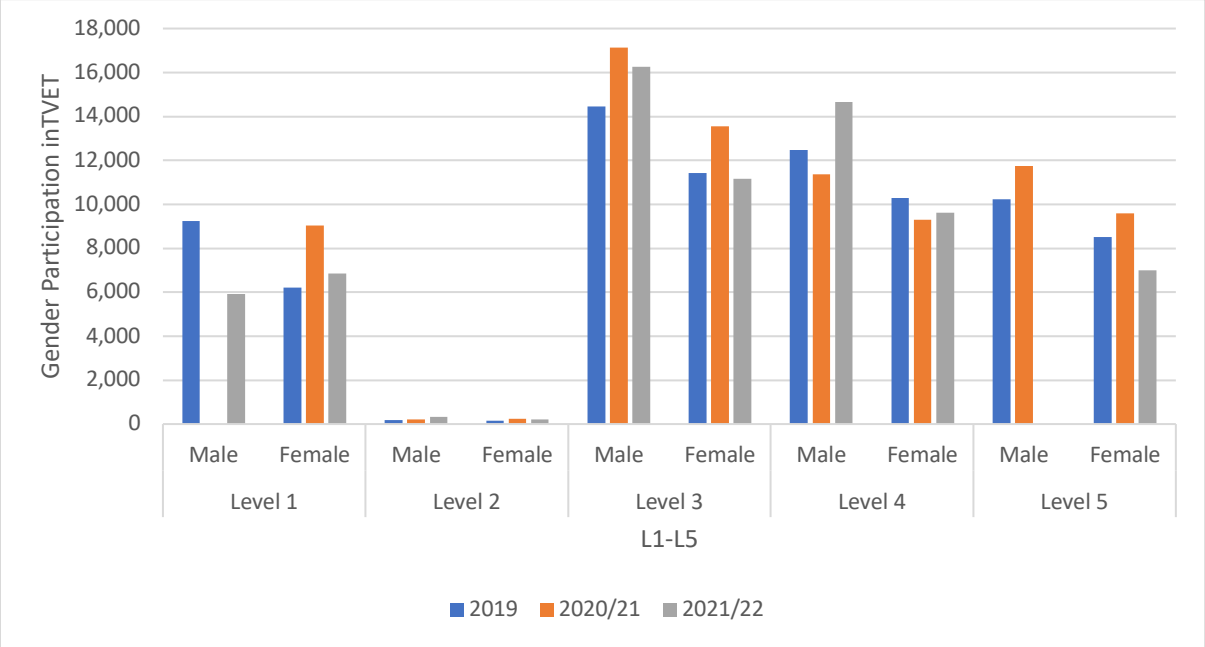


Source: Ministry of Education, 2024 census.

The study also analyzed gender participation across different levels of TVET to better understand the landscape of male and female involvement in TVET institutions (figure 5). At all levels, men generally have higher participation than women across all three years. Both men and women had notably low participation in level 2 for all three years. Interestingly, female participation in TVET institutions exceeded male participation at level 1 in 2020/21 and at level 5 in 2021/22. These patterns highlight areas where further efforts can be made to balance participation across different levels of TVET.

N. B.: Please note that I cannot adjust the figures to reflect the 2019/2020 academic year etc, as the academic calendar for secondary schools prior to the COVID-19 pandemic ran from January to November each year. However, starting from 2020 to the present, the academic year has shifted to a September–July cycle.

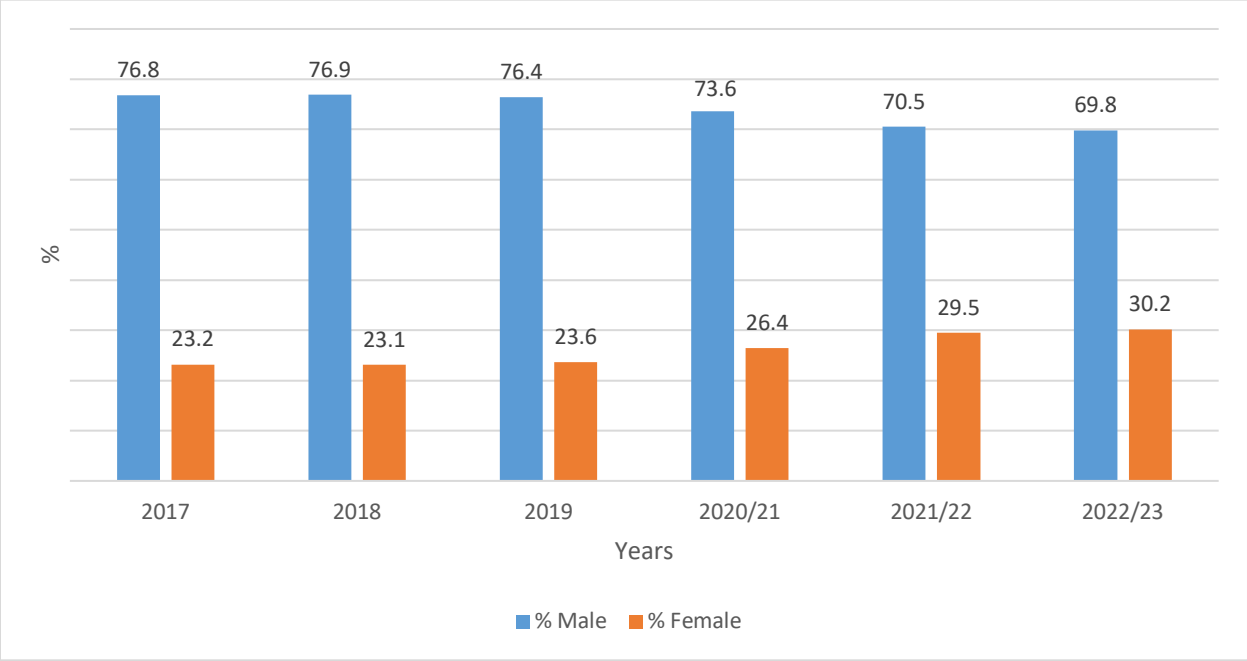
Figure 5. Gender participation, by level, 2019/20–2021/22



Source: Ministry of Education, 2024 census.

The participation of teaching staff in TVET across different levels was also assessed to understand their involvement in delivering education at various levels, categorized by school status (figure 6). The data on teaching staff participation in TVET reveal a gradual increase in female representation over the years, although male teachers still dominate the sector. From 2017/18 to 2019/20, the shares of men and women in teaching staff held fairly steady. Starting in 2020/21, however, male participation began dropping and female participation rising. By 2022/23, women represented 30.2% of teaching staff and men 69.8%. These figures indicate a steady progress toward gender parity in the TVET teaching workforce, reflecting ongoing efforts to encourage greater female involvement in vocational education.

Figure 6. TVET teaching staff, by gender and school status, 2017/18–2022/23 (%)



Source: Ministry of Education, 2024 census.

2.2. National TVET strategy and programs in Rwanda

Rwanda's National Development Plan, specifically through frameworks like Vision 2020 and Vision 2050, prioritizes inclusive economic and social development. Rwanda's Vision 2050 envisions a knowledge-based economy where TVET plays a crucial role in developing skills for technological innovation. The National Strategy for Transformation (NST1) focuses on social transformation, aiming to develop a skilled and capable population through quality education. The Ministry of Education leads efforts to enhance access to TVET, integrating competency-based training and assessment to ensure relevant skills development aligned with labor market needs (Ministry of Education, 2015). Rwanda's economic transformation is driven by education policies focused on science, technology, engineering, and mathematics (STEM); digital technologies; and advanced manufacturing. The Competence-Based Curriculum, introduced in 2015, is key to fostering a comprehensive, skill-based education. The National Skills Development Policy (2016) aligns educational outputs with the demands of emerging industries, focusing on technical skills to address the challenges of the Fourth Industrial Revolution (4IR).

Key national policies guiding Rwanda's development emphasize aligning education with labor market needs and enhancing skills for economic growth. The National Employment Program (2014–2019) aimed to bridge skills gaps and connect TVET graduates to the workforce. The Rwanda National Skills Development Policy (2016) focuses on developing technical and vocational skills to meet industry demands. Additionally, the National Youth Policy (2016) encourages youth participation in TVET programs, with a focus on gender equality and adapting to the 4IR. The National Strategy for Transformation (2017–2024) integrated skills development and job creation as central pillars for economic and social progress, while the Private Sector Development and Youth Employment Strategy (2018–2024) emphasized entrepreneurship

training to empower youth as drivers of Rwanda's economic growth. The TVET Strategic Plan (2019–2024) further aimed to improve training quality, update curricula, and foster public-private partnerships. The National Skills Development and Employment Promotion Strategy, or NSDEPS (2019) highlights the importance of public-private partnerships in TVET success, aiming to ensure that the workforce is equipped to meet the demands of the evolving global job market.

As indicated in the previous paragraph, a number of strategies focus on public-private partnerships, crucial for aligning skills development in TVET with the evolving needs of the labor market. These partnerships foster collaboration between the government, private sector, and other stakeholders, driving innovation, sustainability, and long-term growth. The NSDEPS also emphasizes fostering innovation and entrepreneurship, aiming to cultivate problem-solving, creativity, and risk-taking skills. By encouraging entrepreneurial mindsets, the government seeks to empower individuals to create their own opportunities, not just prepare them for traditional employment.

Additionally, inclusivity and gender equality are central to the NSDEPS, with initiatives to address gender disparities in technical and vocational fields and ensure equal participation of men and women, contributing to a diverse workforce. In terms of infrastructure, the government plays a key role in providing land and initial funding for TVET institutions, whereas private companies contribute advanced facilities, equipment, and technology. The collaboration extends to curriculum design: industry experts work with educators to create programs that meet market demands. Additionally, private companies support training and capacity building by offering internships, apprenticeships, and on-the-job training, bridging the gap between theory and practice. In brief, Rwanda's national development strategies are heavily intertwined with the goals of TVET, ensuring that education and skills development align with the needs of the labor market, foster economic growth, and prepare the population for the challenges and opportunities of the 4IR.

With regard to awareness of national TVET policies, implementation strategies, or action plans, most head teachers from various TVET institutions in Rwanda confirmed being well-informed about the national TVET strategy and its associated plans. When asked about the challenges in aligning their institution's policies and practices with the national strategy, however, respondents highlighted several issues, particularly difficulties in collaborating with industry partners, especially regarding internships. Most respondents indicated they had the capacity to interpret the policy objectives, though a few from private institutions reported challenges in understanding the policies. Additionally, discussion participants noted that academic staff members often lack the necessary digital skills to keep up with technological advancements in teaching and learning, resulting in slow adaptation to new practices in the digital era.

To address the challenges in collaborating with industry partners, respondents suggested that the government should introduce policies to encourage private sector participation through incentives. They also proposed that the private sector should advocate for policy reforms that would involve it in the initial needs assessment, program design, and implementation phases. This approach could strengthen the TVET ecosystem. In terms of implementation strategies,

respondents emphasized the need for several key actions: updating training curricula to align with current industry demands and technological advancements, improving and expanding training facilities and resources to offer hands-on learning experiences, enhancing the skills and teaching methods of educators and trainers, and promoting internships and apprenticeships to give students valuable real-world experience. Overall, the majority of the respondents emphasized that, by leveraging the strengths of both the private and public sectors, Rwanda can develop a robust TVET system that equips individuals with critical skills and drives economic growth and transformation.

2.3. TVET alignment with national industrial development plans

Rwanda has clear aspirations to accelerate inclusive economic and social development, as outlined in the NST1. The NST1 includes a pillar on Social Transformation, with the goal of developing a capable and skilled population that enjoys a high standard of living in a stable and secure society. Achieving this goal involves enhancing the demographic dividend through improved access to quality education.

To fulfill these objectives, the Ministry of Education prioritizes TVET. The Education Sector Strategic Plan (2018–2024) outlines a clear TVET strategy, incorporating competency-based training and assessment, with a quality management system for the training and assessment led by the WDA (WDA, 2019). As part of a restructuring effort to better coordinate the TVET sector in Rwanda, the RTB superseded the WDA in 2017. Rwanda is also strategically integrating digital technologies and advanced manufacturing processes to boost productivity, foster innovation, and diversify its economy.

At the heart of Rwanda's economic transformation are two visionary frameworks: Vision 2020 (2012) and the extended Vision 2050 (2020). These blueprints aim to position Rwanda as a knowledge-based, middle-income economy, with an emphasis on sustainable development and improved living standards. The strategies within these visions focus on economic diversification, investment in human capital, infrastructure development, and the promotion of innovation and technology.

A key driver of Rwanda's economic growth is its commitment to building a knowledge-based economy. The government has prioritized education, especially in STEM fields, which has led to the development of a skilled workforce ready to meet the global economy's evolving needs. In 2015, the government introduced the Competence-Based Curriculum, designed to provide a comprehensive educational framework that supports students' holistic development (REB, 2015). This curriculum includes student counseling, co-curricular activities, and core and elective modules, ensuring students across Rwanda are equipped with STEM education.

Key informant interviews with heads of TVET institutions asked respondents the extent to which their institution's TVET programs align with the priorities outlined in the national industrial development plans and the economic transformation agenda in the country. Most respondents hesitated to talk about the issue, whereas others stated that TVET programs align with national

development plans. The Rwanda National Skills Development Policy (2016) provides a strategic framework for aligning education and training with labor market needs. It advocates for a comprehensive approach to skills development, emphasizing technical and vocational education to prepare the workforce for emerging industries and the challenges of the 4IR.

Policymakers emphasized the importance of the National Employment Program (2014–2019), which aimed to enhance employability by bridging the gap between skills development and labor market needs. They highlighted that key initiatives, such as the graduate employment program, support TVET graduates' transition into the workforce. Policymakers and respondents from regulatory bodies repeatedly mentioned that the Ministry of Public Service and Labour focuses on addressing unemployment through skills development and job creation, aligning closely with TVET by promoting qualified instructors and flexible learning pathways. By collaborating with industry stakeholders and offering work-based learning opportunities like internships and apprenticeships, the National Employment Program ensures that TVET graduates gain practical, job-ready skills, contributing to economic growth and a skilled workforce.

One policymaker from the Ministry of Education said:

> *The TVET Strategic Plan (2019–2024), launched by the Ministry of Education, seeks to enhance the quality and relevance of TVET programs by aligning curricula with industry requirements and adopting emerging technologies. It emphasizes the critical role of public-private partnerships in strengthening TVET initiatives. The plan aims to ensure that training aligns with current labor market demands, while also improving access to TVET, particularly for underprivileged groups, women, and rural communities, through infrastructure development, outreach programs, scholarships, and financial support.*

Notably, although the TVET Strategic Plan (2019–2024) provides a comprehensive framework for enhancing the quality and relevance of TVET programs, its implementation faces several challenges that prevent full success. For instance, many TVET institutions struggle to secure adequate funding for modern infrastructure, updated equipment, and skilled instructors. Furthermore, despite efforts to align curricula with industry needs, a gap often exists between what is taught in TVET institutions and the evolving demands of the job market. In addition, the lack of robust mechanisms for monitoring and evaluating the effectiveness of TVET programs makes it difficult to track progress or identify areas for improvement, leading to inefficiencies and delays in adapting to shifting labor market needs.

2.4. Mainstreaming informal sector training into the TVET system

Integrating informal sector training into Rwanda's national TVET system has been central to recent policy initiatives and scholarly research. The National Policy on Workplace Learning (2017) promotes modernizing traditional apprenticeship systems and recognizing informally acquired skills through Recognition of Prior Learning to bridge the skills gap and enhance employability. Similarly, the NST1 highlights the need to align TVET with labor market demands,

fostering partnerships across sectors such as health, education, and industry to develop practical skills.

The 2017 Skilling Africa's Informal Sector for Growth report emphasizes Rwanda's efforts to address informal sector needs through initiatives like the Skills Development Fund, benefiting over 6,000 young people with vocational skills (AUDA-NEPAD, 2017). The RTB Strategic Plan 2021–2024 focuses on creating a labor market–responsive TVET system and aims to integrate 60% of basic education graduates into TVET programs by 2024. Additionally, World Bank (2015b), which reports on skills development in the informal sector, underscores the importance of improving skills within Rwanda's informal economy, highlighting innovative training programs designed to address skills gaps

In response to the question of how the strategy ensures that the system leaves no one behind, development partners and policymakers highlighted the inclusive policies in place. They explained that Rwanda has adopted inclusive policies aimed at integrating marginalized groups, such as women, youth, and rural populations, into the TVET system. Through financial support, scholarships, and specialized training, informal workers from these groups can access TVET programs, helping to bridge the gap between the formal and informal sectors. Additionally, respondents mentioned government initiatives like the Skills Development Fund, which supports training providers in offering skill development opportunities for the informal sector.

Respondents provided insights into how the formal TVET system recognizes qualifications obtained in the informal sector. They identified three main methods for recognizing these qualifications: (1) competency-based assessment; (2) the Qualification Framework, which integrates informal sector qualifications into national qualification frameworks through equivalency assessments; and (3) certification programs, which are designed to acknowledge skills acquired informally. Respondents confirmed that mechanisms exist for assessing and benchmarking qualifications from the informal sector in line with national qualification frameworks. Policymakers and representatives from regulatory bodies highlighted the presence of TVET quality assurance and certification processes, which ensure proper evaluation and accreditation of informal sector qualifications. These mechanisms aim to facilitate the recognition of skills gained outside the formal education system, enabling individuals to transition more easily into formal TVET pathways and enhance their career prospects. One policymaker mentioned:

> *Ensuring quality assurance in the integration of informal sector training into the TVET is a priority. Rwanda Technical Board, plays a role in regulating and accrediting training institutions that provide both formal and informal training. This helps ensure that informal sector skills training aligns with national standards and certification requirements…. [I]n addition, certification of informal sector workers in fields such as construction, agriculture, and craftwork is vital for enhancing their job market prospects*.

Another government official from the Ministry of Public Service and Labour explained that the National Employment Program in Rwanda supports the integration of informal sector workers

into the formal labor market by offering training, employment opportunities, and skills development. The program connects informal sector workers with employment opportunities and provides incentives for formal sector employers to hire individuals from informal sector backgrounds. By implementing these strategies, Rwanda is working toward a more inclusive and dynamic TVET system that acknowledges the skills developed in the informal sector and integrates them into the broader national economy. These efforts aim to foster economic growth, reduce unemployment, and improve the livelihoods of informal workers.

With regard to women in nonformal and informal categories of TVET, head teachers and parents from different institutions explained that science and technology studies have not fully integrated young women. Consequently, young women are underrepresented in the most technical areas such as electrical, construction, manufacturing, carpentry, vehicle mechanics, and many other specialized areas. They are overrepresented, however, in commerce and traditionally female occupations such as tailoring, weaving baskets, hospitality, and hair dressing.

The perceptions expressed by the respondents align with statistical evidence. Between 2017 and 2019, gender disparities in TVET enrollment remained evident, particularly in traditionally male-dominated fields such as construction and building services, technical services, and manufacturing. In the construction and building services sector, young men represented approximately 82.4% of trainees in 2017, with 20,066 male students out of a total of 24,358. By 2018, male enrollment had increased to 25,430, but female enrollment also saw a modest rise to 5,729. Despite this improvement, men still greatly outnumbered women in the sector. In technical services, males represented 84.5% of students in 2017, with 15,451 male trainees out of a total of 17,277. By 2018, male enrollment had decreased to 10,334, while female enrollment rose to 3,350, indicating a positive trend for female participation.

In manufacturing and mining, young men accounted for 78.5% of trainees in 2017, with 350 male students out of 448 total. By 2018, male enrollment increased to 497, while female enrollment rose to 92, signaling growing interest among females, though males continued to dominate the field. The underrepresentation of women in these technical trades is attributed to various factors, including cultural perceptions, socioeconomic challenges, and limited access to resources.

Regarding the challenges faced by young women and men with disabilities in participating in TVET and vocational training centers, heads of institutions explained that the primary obstacle lies in the stigma felt by families. That stigma often leads families to conceal the presence of their children with disabilities. Consequently, from a young age these children have no exposure to opportunities, leaving them vulnerable in many situations.

Head teachers also noted the lack of adequate assistive technologies for learners, particularly for those with visual impairments or hearing disabilities. A shortage of instructors trained in sign language makes it difficult for these students to fully engage in their education. Respondents noted, however, that the few young people with disabilities who do attend both informal and formal technical schools receive exceptional treatment, particularly when it comes to employment opportunities. This approach is intended to encourage other youth with disabilities

to participate in these institutions. Nonetheless, respondents also noted that, when young women and men with disabilities are employed, they are often relegated to low-paying jobs with limited promotional prospects and poor working conditions.

Since its inception in 2008, TVET in Rwanda has shown significant benefits. According to a 2024 survey by the RTB, 84% of youths who enrolled in short vocational courses since 2017 secured employment within nine months of graduation**.** Notably, 20% of graduates found employment within less than one month, and 63% within one year. Additionally, about 83.2% of TVET graduates praised the industrial-based training program, and 73.4% stated that it equipped them with essential skills for self-employment.

TVET programs designed to address specific skills shortages in key sectors such as agriculture, construction, information and communication technology, and hospitality have resulted in a more skilled and competent workforce. Employers particularly highlighted the hands-on skills of TVET graduates, with unanimous agreement that engineering diploma graduates are well-prepared for the job market. Furthermore, studies show that TVET graduates have higher employment rates than university graduates, with some reports suggesting that 90% of TVET graduates are more skilled and secure jobs faster than their university counterparts. This evidence demonstrates the growing success and impact of TVET in bridging the skills gap and improving employment outcomes.

Aligning TVET with national industrial development plans offers a strategic approach to maximizing the potential of different regions based on their unique geographical advantages, as shown in the following examples.

- **Bugesera**, with its agricultural base and fisheries in six small lakes, combined with cross-border trade with Burundi, would benefit from TVET programs in aquaculture, fisheries management, agriculture, and logistics to enhance both domestic and regional trade.
- **Burera district**, known for agriculture, fisheries around Lake Ruhondo, and cross-border trade with Uganda, can align TVET programs to develop skills in fisheries management, aquaculture, and agro-processing. Such training could create employment opportunities in the local fisheries industry, enhance productivity, and support regional trade activities.
- **Gatsibo**, where cattle keeping is central, could make dairy development a specialty, with TVET programs focusing on dairy farming techniques, milk processing, and animal husbandry. This focus would not only improve the dairy sector's output but also contribute to food security and economic stability in the region.
- In **Gicumbi** district, recognized for its farming, particularly the cultivation of Irish potatoes, beans, and co-peas, TVET institutions can offer specialized training in crop management, agricultural technology, and postharvest handling. Such training would enhance farming productivity and sustainability while providing young people with the skills to modernize farming practices.
- **Gisagara**, with its emerging industrial zones for beer manufacturing, polyethylene bags, meat processing, and rice farming, could align TVET programs to focus on industrial

skills, processing technologies, food safety, and manufacturing management, providing the local workforce with skills that match the growing industrial activities.

- In **Huye**, the presence of numerous universities makes the district an educational hub, with research-focused TVET programs, such as those in environmental sciences, agricultural research, and sustainable development, complementing its role in academic development.
- **Kamonyi**, known for its agricultural activities, could also integrate sustainable agriculture and market-driven farming techniques into its TVET offerings to improve the livelihoods of local farmers.
- Similarly, **Karongi**, **Nyamasheke**, **Rubavu**, **Rusizi**, and **Rutsiro** districts have strong potential related to fishing, transportation, and cross-border trade, particularly through Lake Kivu, which serves as a vital route for transporting goods and services to the Democratic Republic of Congo. TVET programs in these districts can be tailored to offer training in fisheries management, aquaculture, marine transportation, logistics, and cross-border trade. These courses can help local populations enhance their livelihoods and develop key industries that support the region's economic activities.
- Investment in beaches, hotels, and other tourism infrastructure around Lake Kivu presents a huge opportunity for districts like **Karongi** and **Rubavu**. TVET institutions in these areas can offer specialized training in hotel management, event planning, culinary arts, and tourism marketing, which will directly support the growth of the hospitality sector.
- **Kayonza** and **Rwamagana**, both known for banana plantations and agriculture, could focus on banana farming, agro-processing (such as banana flour production), and sustainable agricultural practices to increase the productivity and marketability of banana products, providing opportunities for both youth and women.
- **Kirehe**, with its agricultural focus and significant cross-border trade with Tanzania, can offer training in border trade management, logistics, agriculture, and value-added processing of agricultural products, creating local job opportunities and fostering regional trade.
- In **Muhanga** district, which has significant potential in the mining sector, TVET can offer specialized training in mining technology, engineering, and environmental management to equip the workforce with the skills required to support this sector. Such training will not only enhance the sector's productivity but also contribute to sustainable mining practices that minimize environmental impact.
- **Musanze**, known for its tourism attractions such as gorilla trekking and its robust agricultural sector, can align its TVET offerings to focus on skills related to tourism management, hospitality, agricultural technology, and wildlife conservation. Training programs in these fields can directly contribute to the district's economic growth by meeting the demands of both the tourism and agriculture industries.
- **Nyagatare**, known for green growth initiatives, cattle grazing, and agricultural activities, can benefit from TVET courses focusing on sustainable agriculture, livestock management, and green energy technologies. These sectors can contribute to the

district's environmental goals while improving agricultural practices and cattle farming, key to the area's economy.

- Forests such as **Nyungwe**, famous for its forest canopy walks and tourism-related activities, can benefit from TVET courses focused on ecotourism, environmental conservation, and tourism management.
- **Ruhango** district, with its focus on trade and agriculture, could align its TVET programs to specialize in trade skills, business management, and agriculture-based entrepreneurship.

Aligning TVET development with these regional potentials will not only lead to high enrollment rates for both young women and men but will also help tackle the issue of unemployment in Rwanda. Tailoring training programs to the specific needs of each district will help equip youth with relevant skills that meet local industry demands, thereby reducing the skills gap and increasing employment opportunities. This localized approach will create a sustainable pipeline of skilled workers across sectors, support economic growth in each district, and contribute to national development goals. Moreover, it will promote gender equality, because TVET programs can provide equal opportunities for both genders, empowering women in traditionally male-dominated industries and ensuring that young women and men have access to training in high-demand fields. Through this strategy, Rwanda can harness the full potential of its diverse regions and foster inclusive and sustainable growth.

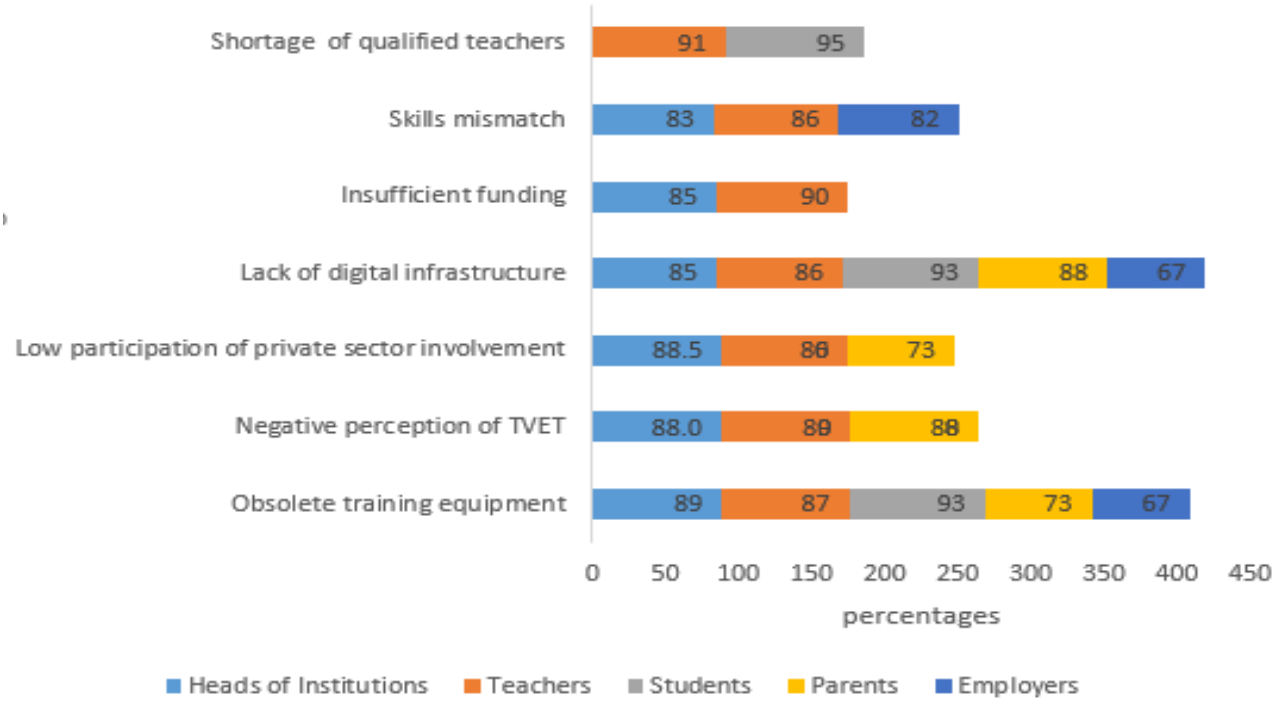
2.5. Key challenges confronting the TVET sector in Rwanda

Hakizayezu and Maniraho (2022) reported that the National Skills Audit conducted in Rwanda in 2009 revealed a 60% shortage of skilled technicians and that a 2012 survey by the Rwanda Development Board identified a shortage of soft skills such as business communication, leadership, and innovation. These findings underscore the need for reforms and enhancements in technical training to better prepare youth for the labor market. Additionally, Top Africa News (2025) highlights challenges faced by TVET institutions, particularly private schools, including a shortage of equipment, infrastructure, and textbooks. These deficiencies severely affect the quality of technical training, limiting graduates' employability. Negative perceptions about TVET prevail, which affect enrollment and the overall attractiveness of TVET programs. Changing this narrative is essential to encourage more youth to pursue vocational training (OECD, 2023).

Survey findings on challenges in the TVET Sector in Rwanda

In this study, heads of institutions, teachers, students, parents, and employers highlighted the following key five challenges confronting the TVET sector in Rwanda (figure 7): obsolete training equipment, lack of digital infrastructure, negative perceptions about TVET, skills mismatch, and low private sector participation.

Figure 7. Challenges in the TVET sector in Rwanda, by stakeholder group (%)



Source: IPAR-Rwanda TVET survey data, 2024.

All groups identified obsolete training equipment as the most significant issue, with 88.5% of heads of institutions, 87% of teachers, 93% of students, 73% of parents, and 67% of employers recognizing it as a major concern. This finding points to a critical need for investment in modern and relevant training equipment to ensure that students learn with tools and technologies that reflect current industry standards. The lower shares of parents and employers suggest that stakeholders such as employers may not fully grasp the importance of upgrading equipment.

Lack of digital infrastructure is another pressing issue, with 85% of heads of institutions, 86% of teachers, 93% of students, and 88% of parents identifying it as a key concern. Employers are less concerned, with only 67% acknowledging the issue. In key informant interviews, heads of institutions emphasized that the lack of digital infrastructure severely limits the ability of TVET institutions to provide up-to-date education, particularly in a technology-driven world where online learning, digital resources, and the teaching of technical skills are essential. They noted that this infrastructure gap not only compromises the quality of education but also hinders students' readiness for the rapidly evolving job market. Teachers similarly expressed the view that overcoming this challenge requires significant investment in digital infrastructure, arguing that preparing students to succeed in careers that increasingly demand digital literacy and technical proficiency will require modernizing TVET systems. Addressing this issue will ensure that TVET institutions can deliver high-quality education that aligns with industry needs and equips students with the skills required in the digital economy.

Another major challenge is the negative perception of TVET, as noted particularly by heads of institutions (88%), teachers (88.5%), and parents (87.5%). Employers also express concern,

although to a lesser extent (67%). Perception of TVET as having lower value compared to general academic education can lead to reduced enrollment, underfunding, and a lack of student motivation. In interviews with key informants, including policymakers, parents, teachers, and representatives from civil society organizations, the majority emphasized the importance of advocacy campaigns and public awareness initiatives to improve the perception of TVET. They pointed out that such efforts are essential to elevate the status of TVET and demonstrate its value as a legitimate and viable career path. By raising awareness and challenging the stigma surrounding vocational education, these campaigns could encourage more students to consider TVET as a worthwhile alternative to traditional academic routes, helping to shift public attitudes and increase enrollment in vocational programs.

The issue of skills mismatch is also significant, with teachers (86%), heads of institutions (83%), and employers (82%) recognizing it as a problem. This skills gap underscores the need for closer collaboration with industry to ensure that curricula align with current employment requirements. In key informant interviews, employers expressed significant concern about the skills mismatch between TVET graduates and the demands of the job market. Employers emphasized that, although TVET institutions provide valuable training, a disconnect often exists between the skills taught and those sought by industry. They called for more frequent consultation between educational institutions and employers to help tailor training programs to meet the evolving requirements of the labor market, ultimately improving the employability of TVET graduates.

Heads of institutions (88.5%) and teachers (86.3%) highlighted low private sector involvement in TVET as a significant challenge, although parents (73%) show less concern, and no data are available for students. The lack of private sector engagement in the development of curricula, provision of internships, funding, equipment, and skills development guidance exacerbates the gap between education and industry needs. Strengthening private sector partnerships is critical to ensuring that TVET programs remain aligned with current job market demands.

Another critical challenge is the shortage of qualified teachers, as noted particularly by students (95%) and teachers (91%). This shortage directly affects the quality of education, resulting in poorly equipped graduates and a diminished industry reputation for TVET programs. Addressing this challenge to improve the quality of education and better prepare students for the workforce will require investments in teacher training, professional development, and retention strategies. Lasting solutions will require urgent and coordinated action from all stakeholders to ensure that the TVET sector in Rwanda can provide quality, relevant education and meet the demands of the evolving job market.

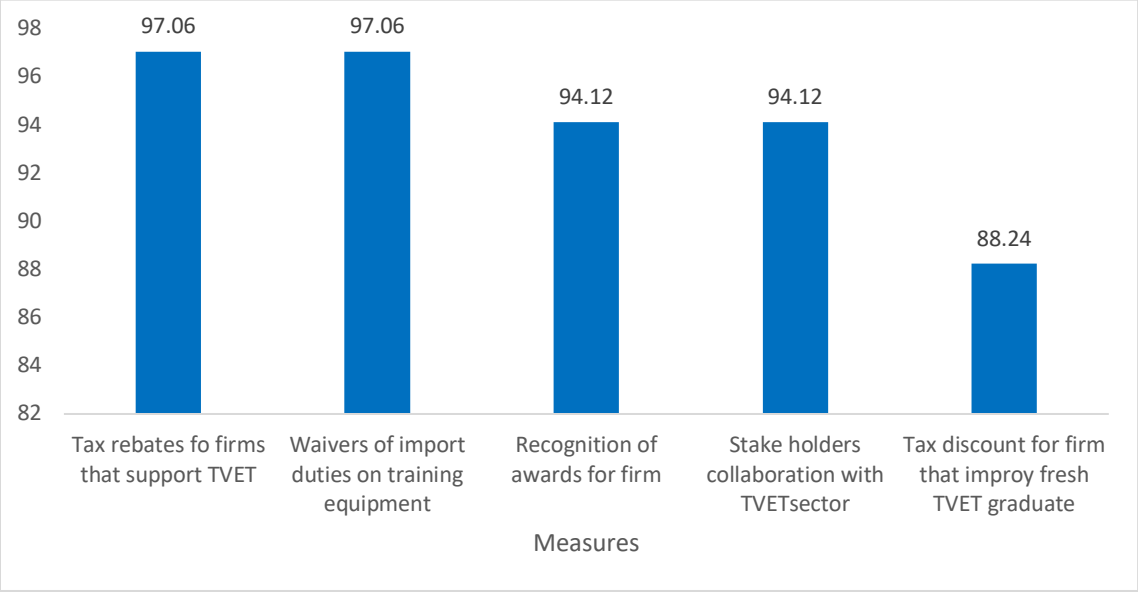
Finally, insufficient funding remains a critical challenge, particularly for heads of institutions (85%) and teachers (90%), with no available data for students or parents. The lack of adequate financial support limits the ability of TVET institutions to improve facilities, hire qualified teachers, update equipment, and expand course offerings. This financial shortfall directly affects the quality of education and the development of relevant skills for students. To address this issue, it is crucial for the government and other stakeholders to prioritize increased financial

investment in TVET. Such an investment would enable TVET institutions to modernize their infrastructure, improve teaching quality, and better prepare students for the demands of the labor market.

Suggested strategies for addressing challenges

The study asked stakeholders for recommendations for addressing the challenges facing the TVET sector in Rwanda. For instance, figure 8 shows the strategies suggested by government officials. According to 97.06% of respondents, two strategies would have the most impact: providing tax rebates for companies that contribute to TVET and offering exemptions on duties for training equipment. Such financial support would reduce the expense for businesses to invest in TVET, making collaboration more appealing. Likewise, 94.12% of respondents highlighted two measures: acknowledging companies with awards for their support of TVET and promoting collaboration with stakeholders. Tax breaks for firms hiring recent TVET graduates (88.24% of respondents) present an incentive for companies to employ these graduates. These measures collectively aim at easing the burden on businesses while enhancing visibility and opportunities for collaboration.

Figure 8. Effective strategies to enhance private sector participation in TVET initiatives (%)



Source: Survey responses by government officials.

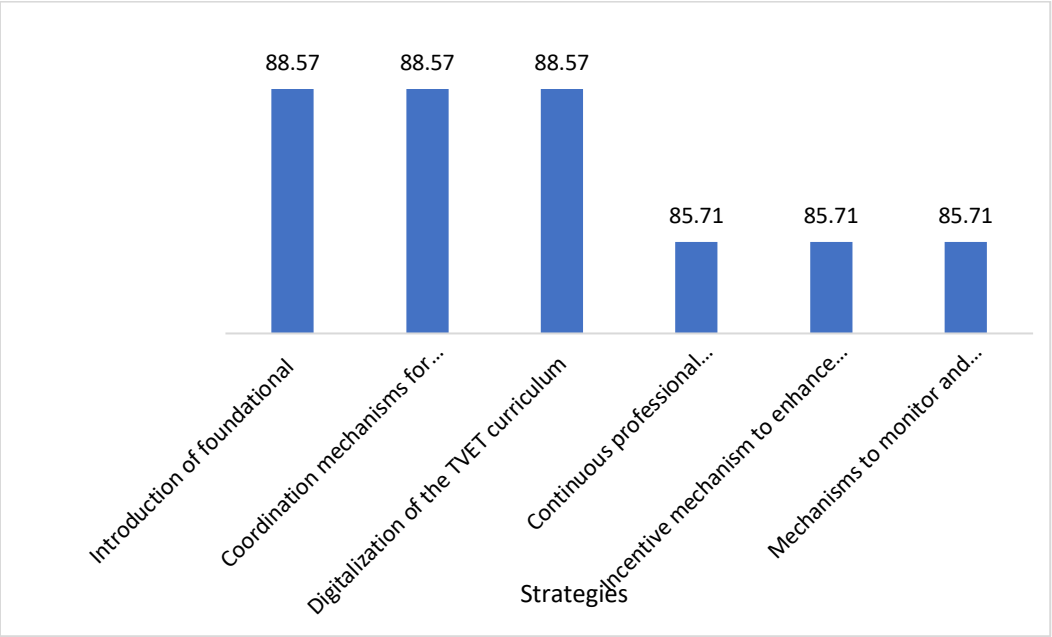
Government officials shared several stories about efforts to address challenges faced by TVET. For example, one official mentioned a local tech company that collaborated with a vocational school to design a tailored curriculum focused on software development, coding, and network security. He explained that the program's success became clear when the company hired several students immediately after graduation, filling critical gaps in its workforce and boosting the regional employment rate. Another official shared an example of a company facing challenges hiring graduates who were technically skilled but lacked soft skills such as communication and teamwork. In response, the company worked with a TVET institution to create a new curriculum module that integrated soft skills training alongside technical instruction. "The shift was noticeable within months. Students were not only learning how to fix machines but also how to communicate with clients, work in teams, and resolve conflicts," the official said.

Additionally, government officials emphasized the importance of lifelong learning and upskilling for the existing workforce. One official shared a story about a local construction company that partnered with TVET institutions to continuously upskill its workers. One employee, who had worked as a laborer for over 20 years, completed a TVET program focused on advanced green building practices. Afterward, he was promoted to project manager and now leads the company's efforts in building energy-efficient homes. His story illustrates the power of upskilling, both improving individual careers and contributing to the company's competitiveness.

In addition, heads of TVET institutions were asked about the strategies the government, particularly the Ministry of Education, should consider for addressing challenges in the TVET sector. The top-three strategies, each with 88.57%, are the introduction of foundational skills, coordination mechanisms for funding TVET, and digitalization of the TVET curriculum (figure 9). The emphasis on foundational skills suggests a need to equip students with basic competencies, likely to create a strong learning base before advancing to more specialized training. Three other strategies follow closely, each with emphasized by 85.71% of respondents: continuous

professional development and lifelong learning, incentive mechanisms to enhance private sector involvement, and mechanisms to monitor and evaluate apprenticeship quality.

Figure 9. Strategies to address challenges facing TVET sector (%)



Source: Based on survey responses by heads of TVET institutions.

One head of a TVET institution discussed the expansion of work-based learning and apprenticeship programs. He explained how his school partnered with a nearby manufacturing company that offered apprenticeships. He noted that, despite challenges during the first two months, by the end of the fourth month, the program had a team of young workers who knew exactly how to operate the machinery.

In response to the challenges faced by TVET graduates, nearly all parents of TVET students cited difficulty in finding employment and the negative perception of TVET as the biggest obstacles within the sector in Rwanda. Private sector respondents also highlighted gaps in practical training, skills mismatch, and a lack of soft skills as key challenges when hiring TVET graduates. TVET instructors pointed to several constraints, including weak governance and management of the TVET system, the negative perception of TVET, skills mismatch, a shortage of qualified TVET teachers, and the poor quality of apprenticeships or practical training.

3. Attributes of a Successful TVET System

3.1. Key attributes of TVET system

A strong technical and vocational education and training (TVET) system that effectively prepares young people for success in the new economy must possess several key attributes. Bennell (2020) emphasized that TVET programs should align closely with the demands of the labor market, ensuring students acquire relevant, up-to-date skills. In addition, OECD (2023) highlighted the need for TVET systems to be flexible, adapting to changes in industry trends, technological advancements, green economies, and the evolving needs of the labor market. The UNESCO Strategy (2022–2029) proposed that quality assurance and accreditation mechanisms are essential for ensuring high quality and international recognition of training programs, providing consistency and credibility to qualifications. Furthermore, World Bank (2021b) stressed the importance of public-private partnerships in bridging the gap between education and employment. These partnerships help align TVET curricula with market needs, enhance training infrastructure, and create apprenticeship opportunities, thereby increasing the employability of graduates. By integrating these elements, a TVET system can better equip young people with the skills and knowledge required to thrive in the rapidly changing global economy.

This section explores the key attributes of a TVET system in Rwanda that can best equip young people with the skills and knowledge needed to thrive in the modern economy. Respondents identified and ranked five critical attributes necessary for equipping young people with the skills required for success in the evolving economy (table 2).

Table 2. Respondents' ranking of essential attributes of a TVET system (%)

Most critical attributes	Institutions	Teachers	Students	Regulatory bodies	CSOs	Private sector	Parents	Average
Co-creation of training programs with industry	100	91.18	95.35	66.67	91.18	86.27	82.35	87.5
Strong private sector involvement in the training and assessment of learners	97.14	85.29	94.88	40	85.29	72.55	67.65	90.4
Emphasis on STEM education	82.86	88.24	89.77	50	88.24	58.82	55.88	73.3
Flexible articulation pathways and progression routes to tertiary education	85.71	88.24	93.95	65	88.24	78.43	85.29	73.5
Job-ready training and ease of transition into employment	94.29	94.12	91.63	52	94.12	76.47	82.35	83.5

Source: IPAR-Rwanda TVET survey data, 2024.
Note: CSO = civil society organization; STEM = science, technology, engineering, and mathematics.

The overall average responses across various stakeholder groups, including heads of institutions, teachers, students, civil society organizations, regulatory bodies, private sector representatives, and parents, highlighted key attributes considered essential for strengthening vocational education and training. These attributes included strong private sector involvement in the training and assessment of learners (90.4%), co-creation of training programs with industry (87.5%), job-ready training that facilitates a smooth transition into employment (83.5%), flexible articulation pathways and progression routes to tertiary education (73.5%), and emphasis on STEM education (73.3%). These findings underscore a broad consensus on the need for collaborative, future-oriented approaches to improve the relevance and impact of training programs.

3.2. Skills forecasting mechanisms

The National Skills for Development and Employment Promotion Strategy (2019) emphasizes fostering innovation and entrepreneurial skills to adapt to the changing nature of work. It aims to cultivate creativity, problem-solving, and risk-taking, preparing individuals for both traditional jobs and entrepreneurial ventures. Central to this strategy are skills forecasting and TVET, which help align education with future labor market demands; however, challenges in Rwanda, such as weak academia–private sector collaboration and unclear policies, hinder progress. According to UNESCO (2020), the importance of skills forecasting in addressing labor market mismatches, particularly in soft skills training for graduates requires much attention.

These insights underscore the urgent need for robust skills forecasting mechanisms to bridge the gaps between education and employment in Rwanda. One practical solution is the establishment of labor market information systems, which collect and analyze data on employment trends, skills demand, and workforce demographics. These systems can provide critical insights into both current and future skills needs. Through continuous employer surveys and feedback, these mechanisms may offer a deeper understanding of the emerging skill requirements and job roles. Such systems have twofold benefits: they enable educational institutions and training providers to offer programs aligned with future labor market demands, and they help minimize mismatches between the skills of the workforce and the needs of employers.

This section focuses on understanding mechanisms for forecasting skills needs, shortages, and gaps across various sectors of the economy. Analyzing labor market information is crucial for aligning TVET with market demand. Labor market data include supply-side details such as demographic trends, school leavers, unemployed individuals, and qualification profiles. In response to forecasting skills needs, shortages, and gaps, policymakers and regulatory bodies highlighted the importance of collaborative efforts among the private sector, TVET instructors, and the government. Through these collaborations, stakeholders will work together to define the competencies and qualifications required by employers across various sectors of the economy.

Policymakers emphasized that conducting needs assessments with input from diverse stakeholders enables educational institutions and training providers to ensure that the workforce is adequately prepared to meet both current and future demands. They also acknowledged that

skills shortages arise from an insufficient supply of workers with the necessary expertise in specific fields. Consequently, they stressed the importance of forecasting these shortages to proactively address training and educational needs to fill these gaps.

Respondents from the private sector emphasized the presence of a skills gap in Rwanda. One private operator explained:

> *There's a significant difference between the skills workers possess and those required by private employers. We will continue to identify these gaps through various forums and platforms, and I hope these efforts will lead to targeted interventions that bridge the divide, ensuring the workforce can meet the evolving needs of both public and private sector employers.*

When asked about the importance of analyzing labor market Information, policymakers agreed that it is essential for ensuring that TVET remains aligned with the actual demands of the labor market. This analysis helps prevent mismatches, with individuals trained in fields that have limited job opportunities or with sectors that have high demand for skilled workers lacking a sufficient supply of trained professionals. Private sector representatives added that labor market analysis is crucial for understanding trends, identifying areas of excess and shortage of supply or demand for specific skills, and forecasting future needs, all of which enable a more proactive approach to workforce planning.

In terms of supply-side data for labor market analysis, policymakers, heads of institutions, and regulatory bodies emphasized the impact of demographic shifts, particularly the large number of individuals entering the workforce. A policymaker stated that every year about 4.4 million young men and women ages 16–30 either enter the labor market or pursue further training in Rwanda. Thus, understanding the size and characteristics of this group, such as their education levels, age, and industry preferences, helps estimate the inflow of potential workers. Private sector employers added that tracking the unemployment rate and analyzing the profiles of unemployed individuals also provides valuable insights into potential labor force pools that could meet demand in specific sectors. Additionally, they noted the importance of qualification profiles in assessing the available workforce. The qualifications of workers indicate the level of skills and education within the labor pool, allowing for a comparison between the supply of skilled workers and the demands of employers. These data help identify areas where further training or development might be necessary to meet industry needs.

Regarding the alignment of TVET with market demand, private sector employers stressed the importance of aligning TVET programs with the specific skills required by the market. They also emphasized that, by forecasting the skills needed in the economy, TVET can adjust curricula, training methods, and certification programs to ensure graduates possess the competencies employers seek from them. One employer emphasized the importance of tailoring training programs to the unique needs and potentials of each district. Another said:

> *The districts of Rubavu, Rutsiro, Karongi, Nyamasheke, and Rusizi benefit from their proximity to Lake Kivu, which borders the Democratic Republic of Congo. This geographic advantage facilitates vibrant cross-border trade and water transportation of goods and services, while also promoting the growth of the tourism industry along the Kivu Belt…. Given that each district possesses distinct resources and opportunities to enhance the socio-economic well-being of its communities, it is essential to align vocational training with these local strengths of the TVET centers that focus on district-specific trades which would equip residents with relevant skills, thereby promoting sustainable development and inclusive economic growth.*

Heads of institutions also pointed out that labor market data are crucial not only for understanding current demands but also for identifying trends and future projections. These data ensure that TVET programs prepare individuals for both existing and emerging job opportunities. Overall, understanding labor market information is essential for accurately forecasting the skills needed across different sectors of the economy. By analyzing demographic trends, school leavers, unemployment data, and qualification profiles, policymakers and educational institutions in Rwanda can better align TVET programs with labor market demand, reducing skills shortages and gaps, and ensuring that the workforce is well-prepared for the economy's needs.

When asked whether the skills forecasting mechanism includes a gender analysis across different economic sectors, heads of TVET institutions indicated that the mechanism does so. This gender analysis includes analyzing the participation rates of women and men in different industries, identifying sectors where women are underrepresented, and understanding the barriers that limit women's participation. Regulatory bodies emphasized the importance of the girls' education policy, which promotes equal access to STEM subjects, as well as government policies aimed at ensuring equal or greater representation of women in key government positions. For example, Rwanda continues to make history as the first country with a female-majority parliament: women hold 63.75% of the seats in the Chamber of Deputies and 53.8% in the Senate. Despite these efforts, CSOs acknowledge systemic barriers, such as cultural norms and financial constraints, that disproportionately affect women. These challenges are particularly evident in male-dominated fields such as plumbing, vehicle mechanics, building and construction, electrical, and manufacturing.

The study highlights the importance of effective communication between labor market stakeholders and training institutions. The national TVET policy stresses the involvement of the private sector, promoting collaborative education and apprenticeships, with much training occurring on-site at businesses. However, limited interaction between TVET institutions and the business community has resulted in hesitation regarding apprenticeships and internships for students. Private sector employers emphasized the need for continuous labor market monitoring, relying on networking and labor market data. Government officials confirmed that the country regularly conducts national skills forecasts to identify current and emerging skill needs.

Relatedly, some respondents from TVET institutions reported that they lack mechanisms for skills anticipation or forecasting to identify skills needs, shortages, and gaps across various sectors of the economy. Furthermore, they noted that they do not receive relevant information from the government regarding skills forecasting. The absence of a well-organized system in place for skills forecasting mechanisms in Rwanda highlights the need for improved coordination and communication between government bodies and TVET institutions to better align training programs with the evolving demands of the labor market.

3.3. Challenges hampering the TVET sector from adapting to labor market demands

Various authors, including Zawdie et al. (2023), highlight the challenges of adapting curricula to keep pace with rapid technological advancements. They emphasize that inadequate collaboration between industry and TVET institutions is a key factor contributing to the widening skills gap. Employers frequently report that graduates lack the specific competencies required in the workforce, particularly in emerging areas such as Fourth Industrial Revolution (4IR) technologies. Similarly, Chisholm et al. (2021b) argue that weak connections between TVET institutions and industries exacerbate this skills mismatch, making it difficult to integrate 4IR skills into training programs. Additionally, many TVET institutions struggle to provide up-to-date technological tools and equipment necessary for training in fields like robotics and data analytics. The lack of investment in infrastructure limits opportunities for hands-on learning, preventing students from acquiring the practical skills needed for success in the digital economy. In addition, Khan and Yusuf (2022) highlight that inadequate infrastructure and a lack of technical expertise among instructors hinder the teaching of emerging 4IR-relevant skills in automation, digital technologies, and data analytics.

Despite the importance of continuous professional development, it remains insufficient. Tariq et al. (2023) stress the need for ongoing teacher training to address these gaps. Limited funding further restricts the ability to adopt new technologies and update curricula, a concern discussed by King and McGrath (2021) in relation to public policy and funding barriers. Additionally, Gandhi et al. (2023a) note that TVET is often seen as a secondary option to higher education, resulting in low enrollment and limited societal recognition of vocational skills, which hamper the sector's growth and its capacity to meet the evolving needs of the labor market.

Table 3. Challenges hampering TVET adaptation to evolving labor market demands, by respondent group (%)

Type of challenge	Institutions	Teachers	Students	Regulatory bodies	CSOs

Absence of labor market information or skill forecasting system	91.18	91.12	88.84	25.00	91.18
Lack of knowledge regarding the skills and competencies required for entrepreneurship, digitalization or education for sustainable development	100	91.72	83.72	66.67	100
Low capacity of TVET institutions on how to adjust training in line with changing skill needs	94.12	87.57	84.65	50.00	94.12
Low commitment to reform among policymakers, TVET institutions, and other stakeholders	91.18	85.80	86.51	0	91.18
Negative attitude toward new technologies and/or resistance to change among TVET teaching staff	88.24	88.17	85.58	25	88.24
Low participation of private sector entities to engage in reform processes	94.12	86.39	86.98	40	91.18
Shortage of TVET teaching staff with required skills and/or qualifications	91.18	93.49	86.51	25	88.24
Inadequate IT facilities, technology-mediated learning, and digital infrastructure	91.18	47.34	84.19	33	94.12
Preference of employers to use unskilled or semiskilled labor for low-paying jobs and expatriates for skilled tasks	94.12	83.43	84.65	25	94.12
Low demand for skilled labor and low interest in upgrading to skill-intensive technologies	94.12	83.43	83.26	25	91.18

Source: IPAR-Rwanda TVET survey data, 2024.

The findings presented in table 3 highlight key challenges hindering the TVET sector's ability to adapt to the evolving demands of the labor market. A major challenge identified is the lack of a labor market information or skills forecasting system. Institutional heads and CSOs both rated this issue highly (91.18%), followed closely by teachers (91.12%) and students (88.84%). Regulatory bodies (25%) rated its importance much lower. During interviews, teachers repeatedly said that TVET quality and relevance are deterred by gaps in complementary physical and digital infrastructure, equipment, and learning materials. In focus group discussions, students highlighted the persistence of limited access to technology, particularly among disadvantaged students. Those from poorer backgrounds living in rural remote areas are disproportionately affected by a lack of internet connectivity points, amplifying the disparity between urban and rural remote areas in terms of access to essential resources for remote learning.

Another significant challenge identified was the lack of knowledge regarding the skills and competencies needed for entrepreneurship, digitalization, and education for sustainable development. Institutional heads and CSOs rated this challenge highly (100%), indicating full recognition of the issue. Teachers (91.72%) followed closely, and students (83.72%) gave it less importance. Regulatory bodies (66.67%) rated it as even less important. Overall, these findings suggest a widespread recognition of the gap in knowledge and competencies in these critical

areas, highlighting the need for targeted training and curriculum development to address these emerging skill requirements.

Another significant challenge identified was the low capacity of TVET institutions to adjust training programs in response to changing skills needs. Institutional heads and CSOs rated this challenge highly (94.1%), reflecting a strong awareness of the issue. Teachers (87.57%) and students (84.65%) also rated it highly. Regulatory bodies (50%) gave it only moderate importance. These findings highlight the need for capacity-building initiatives within TVET institutions to better align training programs with the dynamic demands of the labor market.

A further challenge identified was the low commitment to reform among policymakers, TVET institutions, and other stakeholders. Institutional heads and CSOs agreed on the importance of this issue (91.18%). Students (86.51%) and teachers (85.80%) rated it somewhat less highly, still highlighting concern about the lack of drive for change. Regulatory bodies did not provide a response, suggesting a gap in their engagement with the issue. These findings suggest that enhancing the commitment to reform across all levels is critical for advancing the effectiveness and relevance of TVET programs.

Another challenge identified was the negative attitude toward new technologies and resistance to change among TVET teaching staff. Institutional heads and CSOs rated this issue highly (88.24%), indicating a strong awareness of the problem. Teachers (88.17%) rated it slightly lower, followed by students (85.58%), reflecting concern about the reluctance to embrace technological advancements. Regulatory bodies (25%) rated this challenge much lower, suggesting limited recognition of the issue within their framework.

The low participation of private sector entities in the reform process was another key challenge assessed. Institutional heads (94.1%) indicated a strong recognition of the problem within TVET institutions. CSOs (91.18%) further emphasized the need for greater private sector engagement in the reform process. Students (86.98%) and teachers (86.39%) also showed concern for this issue. By contrast, regulatory bodies (40%) rated this challenge as only moderately important.

The shortage of TVET teaching staff with the required skills and qualifications was identified as another significant challenge, particularly by teachers (93.49%) and institutional heads (91.18%). CSOs (88.24%) and students also expressed concern (86.51%), whereas regulatory bodies (25%) indicated less awareness or acknowledgment of the problem.

CSOs (94.12%) and heads of institutions (91.18%) identified inadequate information technology facilities, technology-mediated learning, and digital infrastructure as significant challenges in TVET. Students (84.19%) also recognized this issue as important, emphasizing the need for accessible digital tools. Regulatory bodies (33%) had much lower recognition, rating it at 33%.

Among CSOs and heads of institutions (94.12%), the preference of employers to hire unskilled or semi-skilled labor for low-paying jobs, and expatriates for skilled tasks, emerged as another significant challenge. Students (84.65%) and teachers (83.43%) also expressed concerned. By contrast, regulatory bodies (25%) showed limited recognition of the issue at the policy level.

Last, institutional heads (94.12%) and CSOs (91.18%) identified the low demand for skilled labor and the lack of interest in upgrading to skill-intensive roles as significant challenges hindering the alignment of TVET programs with the evolving demands of the labor market. Teachers (83.43%) and students (83.26%) expressed similar levels of concerns. Regulatory bodies (25%) rated the challenge much lower, indicating a limited understanding of the issue at the policy level.

Gender issues

Private sector employers were also asked whether the evolving labor market demands affect men and women differently in terms of required skills and opportunities. The majority of respondents indicated that the labor market does not demand different skills or opportunities for men and women. Instead, they pointed to cultural or psychological factors that contribute to the differences in how men and women are perceived in the labor market. For example, the garment subsector tends to employ more women, whereas the construction sector typically hires more men.

By contrast, teachers noted that the evolving labor market does, in fact, affect men and women differently, particularly in two key areas. They repeatedly mentioned gender disparity, explaining that the evolving labor market often benefits men more because of existing gender biases and occupational segregation. Women may face barriers in entering high-demand fields such as technology and engineering because of gender stereotypes and a lack of female role models in these industries. They also expressed that women may have less access to training programs and resources necessary for acquiring emerging skills, which can hinder their ability to compete for new opportunities in rapidly growing sectors.

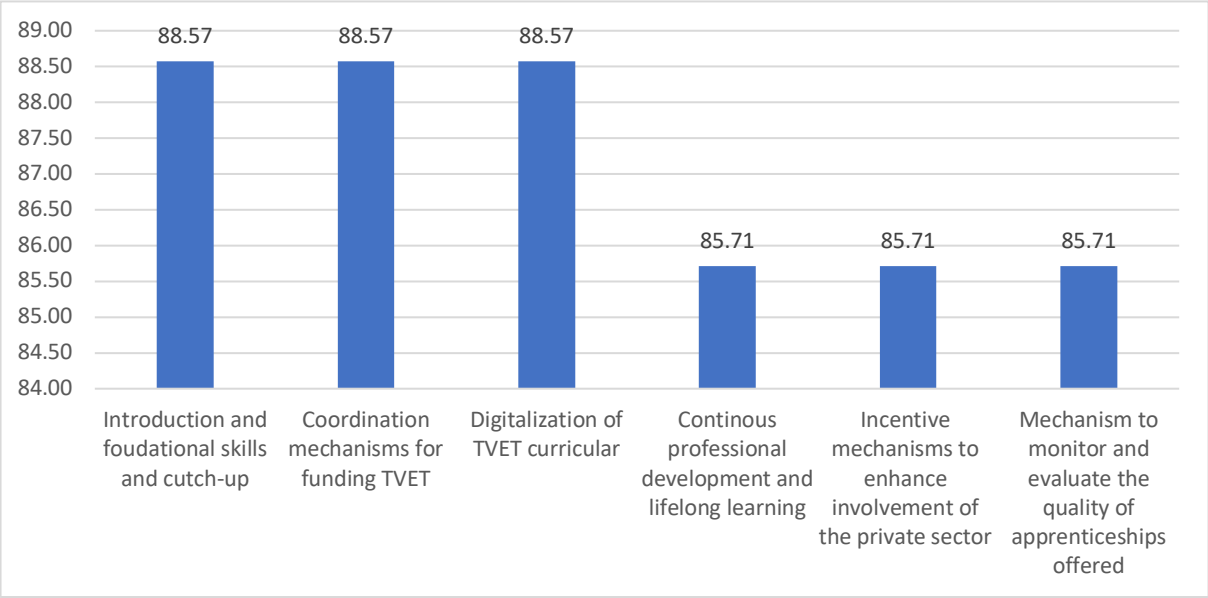
Government officials and regulatory agencies highlighted the importance of addressing gender disparities in TVET by promoting policies that ensure equal access for all. TVET institutions are becoming more aware of and responsive to the gender dimensions of labor market demand. Regulatory bodies are focused on aligning TVET programs with labor market needs, enhancing their relevance and quality, and expanding access to underserved populations. Although access to both private and public TVET institutions is nondiscriminatory, public institutions receive additional support, particularly in terms of facilities for trainees and learners with special needs.

Suggested actions to address TVET challenges

Stakeholders were asked for recommendations of specific government actions to address the challenges faced by the TVET sector in adapting to the evolving demands of the labor market. Figure 10 shows recommendations made by heads of institutions, with 88.57% of respondents supporting the introduction of foundational skills catch-up programs, the establishment of coordination mechanisms for funding TVET, and the necessity of incorporating digital skills and technology to better meet market demands. Similarly, 85.71% of respondents emphasized continuous professional development for educators, which will help educators stay connected to relevant industry developments and enhance the effectiveness of their training; incentive mechanisms to boost private sector participation, such as by offering tax breaks or other

attractive benefits to motivate companies to support TVET initiatives through equipment provision, internships, or collaborative programs; and mechanisms to assess and ensure the quality of apprenticeships, ensuring that students receive hands-on training that is both relevant and aligned with industry needs.

Figure 10. Suggested government actions to address challenges in the TVET sector (%)



Source: IPAR-Rwanda TVET survey data, 2024.

According to private sector employers, by contrast, one of the biggest challenges among various stakeholders is the lack of commitment to collaborate with the right partners to achieve shared objectives. These respondents also highlighted concerns related to access, equity, quality, and relevance, pointing out that many Rwandan institutions often prioritize their own areas of expertise, particularly technical skills, over the skills that businesses and students need, such as digital, cognitive, and entrepreneurial skills. They also suggested that securing private funding could provide TVET institutions with additional resources.

With regard to interventions the government should take, parents proposed several initiatives. Most emphasized the importance of improving TVET teachers' competency, raising awareness, reforming the TVET system, strengthening Labor Market Information Systems, encouraging startups, and fostering public-private partnerships. Policymakers acknowledged that gender-sensitive policies and programs have been developed to address disparities, including initiatives to support young women in STEM fields and increase female participation in traditionally male-dominated trades.

Regarding program development, officials from regulatory agencies revealed that TVET institutions are incorporating gender considerations into program design and delivery. They also offer support services tailored to the needs of both genders and fostering inclusive learning environments. Several respondents from various sectors further emphasized the importance of

building capacities within TVET institutions. They suggested that effective, efficient, and dedicated TVET providers capable of developing and delivering flexible, demand-driven programs are crucial to the TVET system. Strengthening both public and private providers is therefore a key responsibility of TVET authorities.

3.4. Extent of TVET system digitalization to respond to changing skill needs

Several authors have explored the importance of digital skills integration within Rwanda's TVET system to prepare young people for the technology-driven job market. Bennell (2020) highlights the crucial role of integrating digital skills into TVET programs, showing that doing so would enable graduates to develop competencies relevant to sectors like information and communication technology (ICT), manufacturing, and services. This integration significantly improves employability by equipping students with the necessary skills for a technology-driven labor market.

Schleicher (2021a) emphasizes the need for adapting TVET curricula to meet the demands of the 4IR. His focus on ICT skills and digital tools underscores the importance of equipping students with digital literacy to succeed in an increasingly digital economy. Kamanzi and Ngirabatware (2022) further examined Rwanda's TVET sector, stressing the need for enhanced digital infrastructure, online learning platforms, and training programs to prepare students for emerging technologies. Munyaneza (2023) argues that integrating digital competencies into vocational training programs is essential for ensuring that Rwanda's workforce is well-prepared for digital transformation and technology-driven industries.

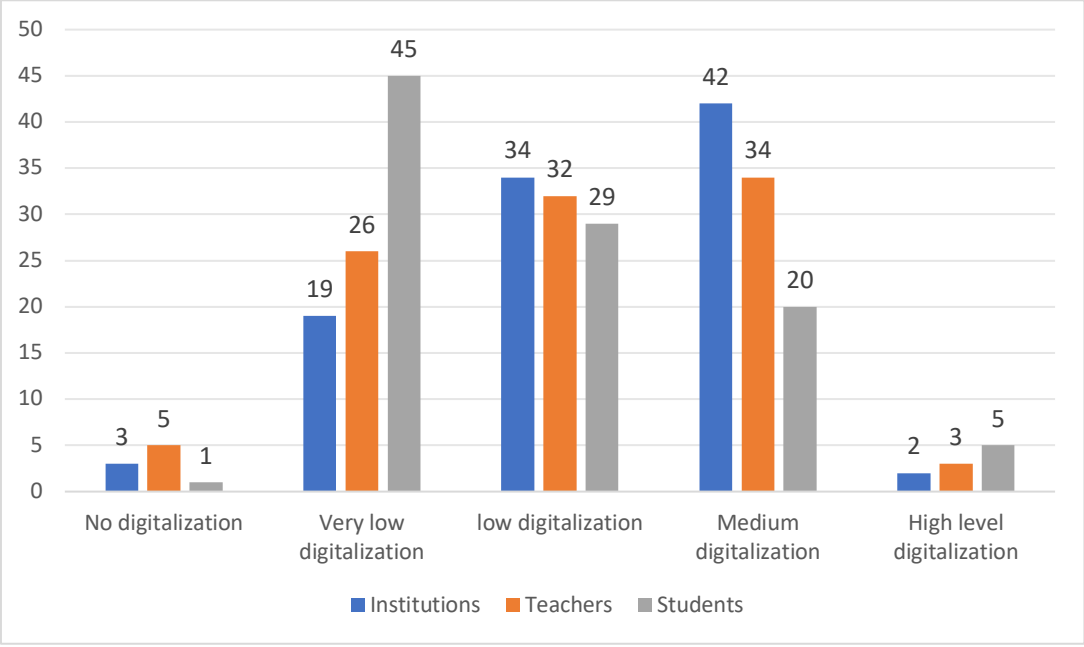
Additionally, the Rwanda Education Board (2021) report outlined how TVET institutions in Rwanda are adapting to incorporate digital tools and methodologies, particularly in ICT, manufacturing, and agriculture, to ensure students are equipped for a digitalized workforce. Collectively, these works demonstrate the importance of digital skills in transforming Rwanda's TVET system to meet the demands of the evolving labor market.

Grech and Camilleri (2020) discuss the digitalization of TVET systems, addressing the broader implications of digital transformations in education and vocational training, including Rwanda, whereas ILO and UNESCO (2020) report on the global impact of digitalization on TVET systems, including insights from Rwanda. Their work highlights how digital tools are being integrated into vocational training to enhance skills development. Digitization is becoming the driving force behind lifelong learning and flexible learning pathways. The evolution of technology is driving two associated trends.

On the one hand, distance learning technologies, micro-learning and evolution in support technologies, such as scheduling software, are significantly expanding institutions' capacities to offer flexible learning opportunities at times and places driven by learner needs rather than institutional needs. On the other hand, continued digitalization of processes within industry means that workers need to return to education or training at several stages across their working careers to remain relevant.

This section reports on insights collected from government officials, regulating bodies, TVET teachers, and heads of TVET institutions about the digitalization of the TVET system in response to the changing skills needs in the technology-driven workplace. The findings, shown in figure 11, indicate generally very low to medium levels of digitalization, according to institutional heads, teachers, and students. These results suggest that some programs are effectively incorporating digital tools to equip students with essential skills for the job market, but that many still face challenges in fully modernizing their systems and teaching methods.

Figure 11. Digitalization of the TVET system, by stakeholder group (%)

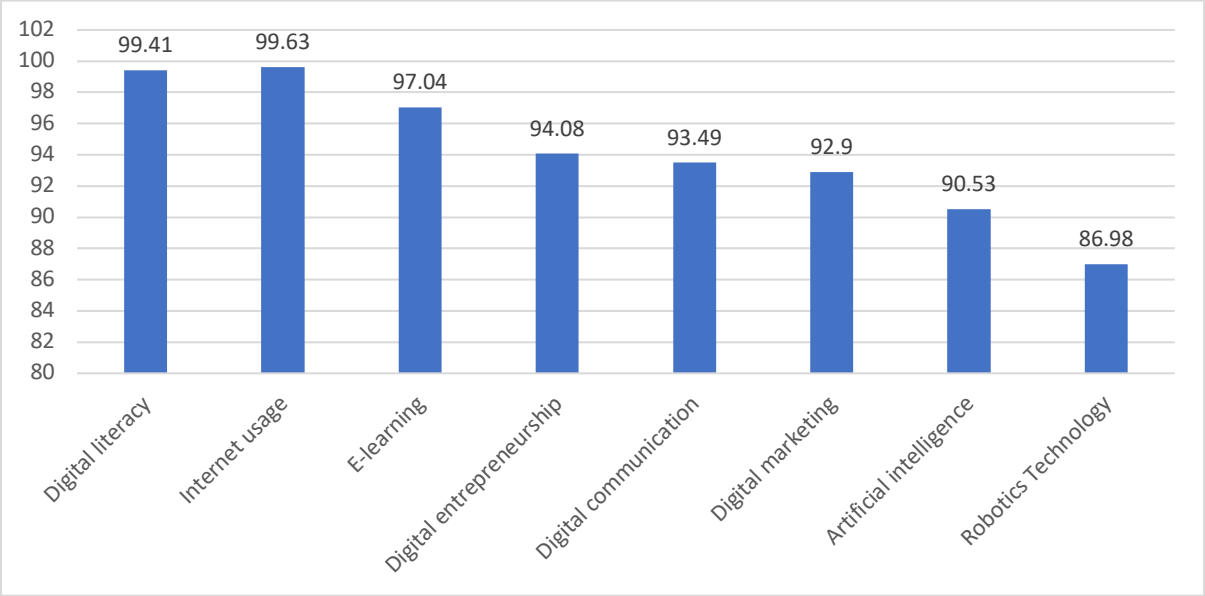


Source: IPAR-Rwanda TVET survey data, 2024.

Additionally, 5% of respondents noted limited or no digital presence, suggesting that some institutions have yet to effectively adopt digital technologies. To address this disparity, it is essential to enhance digital infrastructure, provide training for educators, and ensure that all TVET institutions can teach the crucial digital skills required in today's rapidly evolving job market. A more robust digitalization strategy will be vital for adapting the TVET system to meet the demands of modern industries, particularly as the 4IR continues to reshape the workforce.

The survey asked teachers to assess whether the TVET system is adequately digitalized to meet the current and future skills required in a technology-driven workplace. Participants provided feedback on how digital skills and competencies are being integrated into TVET training programs (figure 12). This feedback offers insights into the types of digital lessons included in the curriculum to better prepare students for technology-based work environments.

Figure 12. Skill competencies for a technology-driven workforce (%)



Source: IPAR-Rwanda TVET survey data, 2024.

The findings highlight that basic digital literacy is a core component of the TVET curriculum, with 99.41% of respondents confirming its inclusion. Key areas of focus include computer and internet proficiency, effective internet use, and familiarity with online learning platforms, which are essential for keeping students competitive in a tech-driven world. TVET programs also include advanced topics such as digital entrepreneurship, digital communication, and digital marketing to prepare students for business and professional success. Emerging technologies like artificial intelligence and robotics are being introduced, although full integration is still developing.

Development partners were also asked about the knowledge, skills, and competencies related to digitalization that are currently being taught in training programs for TVET students in Rwanda's institutions. The majority of respondents highlighted the inadequacy of physical infrastructure, including computers, smart classrooms, reliable internet access, and digital literacy resources. Additionally, they reported that areas such as e-learning, digital entrepreneurship, digital communication, digital marketing, artificial intelligence, and robotics technology are not being effectively implemented or practiced.

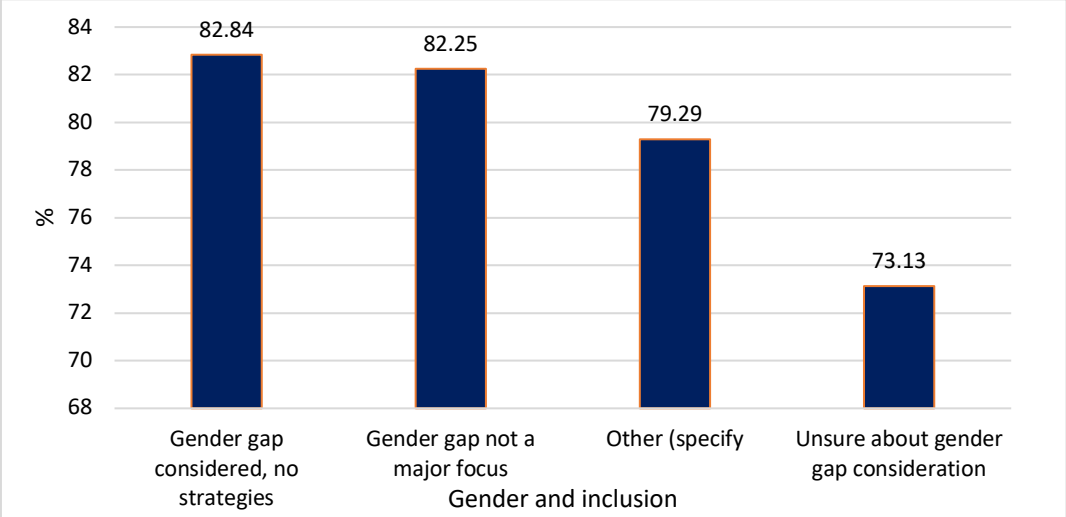
When asked to assess how well their training had equipped them with the specific skills needed for their future career, 37% of students reported feeling very well prepared, and 45% felt somewhat prepared. However, 10% of respondents were neutral on the matter, 6% indicated feeling inadequately prepared, and 1% feeling not prepared at all. These results highlight a gap in training that may need to be addressed to ensure more comprehensive preparation for students entering the workforce.

Students were also asked whether they believe companies in their respective fields ensure equal access and opportunities for female students and individuals with disabilities in internships, work placements, and job offers. In response, 40% of students agreed that equal access to these

opportunities is provided, 20% strongly agreed with this statement, and 11% of students were neutral on the issue. However, 5% disagreed, indicating that they do not believe equal access is ensured, and 4% strongly disagreed. These results suggest the need for further efforts to ensure inclusivity and equal access in internships, work placements, and job offers across the industry.

In response to questions about gender, inclusion, and the rural-urban divide in the digitalization of the TVET education system, the heads of TVET institutions explained the relationship between these issues, as summarized in figure 13. A significant portion, 82.84%, acknowledges the gender gap but notes a lack of specific strategies to address it. Additionally, 82.25% of respondents feel that gender considerations are not a major focus in TVET digitalization, suggesting they may be overshadowed by other concerns. A smaller group, 79.29%, selected "Other," indicating additional factors influencing digitalization. Last, 73.13% expressed uncertainty about whether the gender gap is being actively considered, revealing ambiguity around the prioritization of gender inclusion in digitalization efforts.

Figure 13. Gender and inclusion in digitalization (%)



Source: IPAR-Rwanda TVET survey data, 2024.

Development partners and CSOs proposed several initiatives to bridge the digital gender gap and empower women in the digital space. Key recommendations include raising awareness of the importance of digital technology for both personal and professional growth, offering tailored training programs for diverse skill levels, and fostering a supportive environment to encourage female participation. Establishing model colleges focused on digital skills can also help promote female enrollment and integrate technology into education. These initiatives aim to bridge the digital gap, foster inclusivity, and empower women to thrive in the digital economy through education, mentorship, and community engagement.

3.5. Measures taken to incorporate green skills into the training curricula in Rwanda

According to UNEP (2022), Rwanda has introduced tax incentives for electronic vehicle (EV) buyers, fostered the growth of local EV manufacturers, and unveiled ambitious plans to electrify public buses. These efforts aim to reduce rising air pollution and lower greenhouse gas emissions, which contribute to climate change. Currently, nearly 900 locally manufactured EVs, including motorbikes from the start-up Ampersand, are operating on Rwanda's roads. Major global manufacturers have also set their sights on the country, which became home to Africa's first electric Volkswagen. Electric trucks have also been deployed to deliver essential goods in rural areas.

In addition, a report on e-mobility in Africa, highlights Rwanda's e-mobility program, which outlines a phased adoption of electric buses, passenger vehicles, and motorcycles starting in 2020 (CDH, 2022). This transition is expected to displace conventional vehicle sales, reduce transportation fuel imports, and decrease associated greenhouse gas emissions. To support this shift, Rwanda's EV policies exempt EVs, spare parts, batteries, and charging station equipment from import and excise duties. These products are also classified as zero-rated for value-added tax and are exempt from withholding tax (CDH, 2022).

Green skills refer to the knowledge, capabilities, and technical expertise needed to perform tasks in an environmentally sustainable manner within the green economy, such as in sectors like renewable energy, EVs, and waste management. Integrating green practices into TVET can be achieved through various strategies. Research highlights a significant knowledge gap among vocational education teachers regarding green technologies (Li et al., 2023), underscoring the need for educational reform to incorporate green skills into TVET programs (McGrath and Russon, 2023).

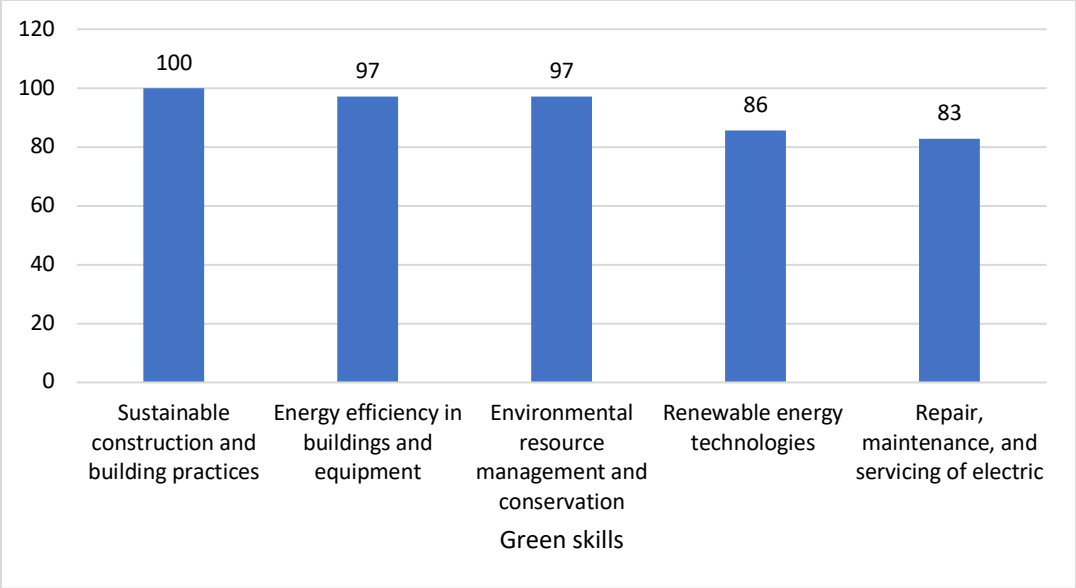
Murtaza et .al (2023) discuss how TVET institutions are adapting to the growing demand for skilled workers in green technologies such as EVs and solar energy, highlighting curriculum changes and industry partnerships, while Kariuk and Njoroge (2022) focus on the integration of renewable energy and EV technologies into TVET programs, detailing how institutions are preparing students to meet the needs of the green economy.

Further studies emphasize the importance of enhancing teachers' expertise in sustainable development to foster green skills competency among TVET trainees (Ramli et al., 2022). Industry stakeholders in TVET institutions advocate for the inclusion of green technology in curricula to meet industry demands and modernize vocational education programs (Kaliappan and Hamid, 2021). By addressing these areas, TVET institutions can effectively integrate green practices, equipping students for environmentally conscious and sustainable careers.

The study assessed how TVET institutions are incorporating green skills into their curricula to address climate change and environmental sustainability. It focused on the integration of sustainable practices such as sustainable construction techniques, energy efficiency in buildings and equipment, and renewable energy technologies. The findings, illustrated in figure 14, highlight the extent to which these environmental considerations are being incorporated into

training programs, aiming to equip students with the skills needed to contribute to sustainable development and environmental protection.

Figure 14. Integration of green skills into the curriculum (%)



Source: IPAR-Rwanda Survey data, 2024.

The study found that TVET institutions in Rwanda are increasingly integrating green skills into their training programs. All respondents reported incorporating sustainable construction and building practices into their curricula, aligning with Rwanda's green growth goals. Additionally, 97.14% of institutions offer training in energy efficiency and in environmental resource management and conservation, equipping students with skills to reduce energy consumption and minimize environmental impacts.

This survey asked stakeholders for their insights on the measures TVET systems are taking to incorporate green skills into training curricula to address climate change and environmental sustainability. Overall, the findings indicate that green economy skills are underdeveloped, highlighting the need for extensive training in green skills for students, trainers, educators, and the private sector.

- Government officials, asked about the current demand for graduates with green skills in Rwanda's labor market, indicated that green skills have not yet reached their full potential, primarily because of low adoption by TVET instructors, who often lack the necessary literacy skills. They also identified key challenges to greening TVET in Rwanda, including a lack of awareness of green skills among stakeholders, limited access to green industry internships, and insufficient funding for developing green TVET programs.
- Teachers acknowledged the need for a capacity gap analysis to address the digital divide. They suggested that continuous training and outreach programs in industries are essential

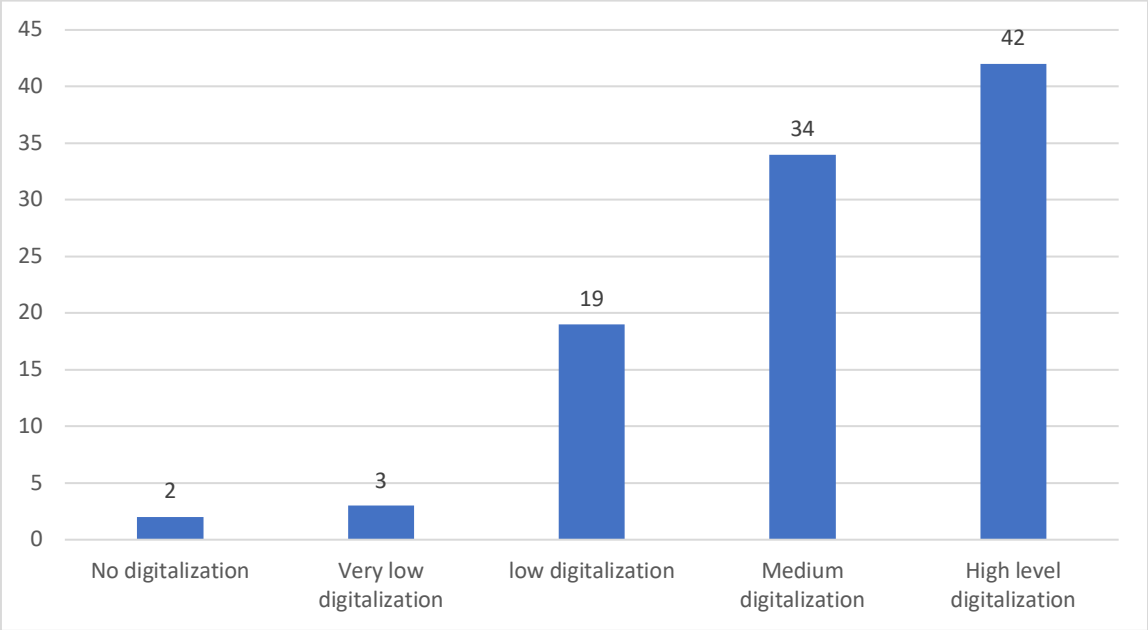
to meet evolving industrial skills requirements and to effectively transfer this knowledge to students.

- Similarly, TVET institutions were asked about the extent to which green skills have been integrated into their curricula. Their responses highlighted limited integration due to inadequate infrastructure, though they noted efforts to align with the demands of the 4IR.
- Private sector respondents revealed that most businesses have not yet adopted green skills, though some have started incorporating them into their operations.

Several authors have expressed concerns regarding the extent to which TVET curricula in Rwanda are digitalized to meet the evolving skills needed in the technology-driven workplace. Gatari et al. (2023) discuss how Rwanda is incorporating green skills into TVET curricula and the challenges faced by institutions in aligning with environmental sustainability goals. Ndayambaje and Bizimana (2022) examined the strategies employed by TVET institutions in Rwanda to prepare students for the green economy, with a focus on renewable energy technologies, sustainable agriculture, and environmental conservation practices. The Rwanda National Commission for UNESCO (2021) outlines the country's national strategy for greening TVET programs, emphasizing the integration of green skills across sectors such as renewable energy, eco-friendly construction, and sustainable tourism.

The study asked students about the extent to which TVET curricula in Rwanda are digitalized to meet the changing skills needs in the technology-driven workplace. As shown in figure 15, 42% of students a medium level of digitalization, and 34% reported a low level. However, 19% of respondents indicated very low digitalization in the curricula. Additionally, 3% stated that there is no digitalization, and only 2% reported a high level of digitalization. These results highlight the need for further investment in digital tools and resources to ensure that all students are adequately prepared for the increasingly digital and technology-oriented job market.

Figure 15. Extent of digitalization of TVET curricula (%)



Source: IPAR-Rwanda Survey data, 2024.

4. Identifying Key Players and Priorities in TVET

4.1. Mechanisms for stakeholder coordination

The Ministry of Education (2021) outlines the mechanisms for stakeholder coordination in Rwanda's technical and vocational education and training (TVET) sector, emphasizing the importance of collaboration between the public and private sectors, development partners, and educational institutions to ensure that TVET programs align with national economic priorities. Munyaneza and Ntirenganya (2023) examined the coordination mechanisms among key stakeholders in Rwanda's TVET sector, including government ministries, private sector employers, and international partners. Their study highlights challenges in communication and collaboration and proposes solutions to enhance stakeholder engagement in shaping TVET policies and programs. Similarly, Hassan and Iradukunda (2022) explored the role of stakeholder coordination in the success of TVET in Rwanda, focusing on how key players such as the Rwanda Development Board, the Ministry of Education, private companies, and development agencies work together to develop skills that meet the needs of the economy.

For Rwanda's TVET sector, coordination and cooperation among stakeholders are facilitated through the implementation of public-private partnerships (Jembere et al., 2023; Melesse et al., 2023. These partnerships aim to foster effective collaboration by promoting ownership, equitable participation, and shared decision-making (Wudneh et al., 2022b). However, challenges persist in translating these principles into practice. Power imbalances and limited local involvement often hinder genuine ownership and equal participation in decision-making processes (Wudneh, Seifu, and Dagnew, 2022).

This section presents insights gathered on the mechanisms for stakeholder coordination within the Rwandan TVET system, drawing from government officials, regulatory bodies, TVET institutional leaders, and civil society organizations (CSOs). The study asked respondents whether Rwanda has functional platforms in place to facilitate coordination and cooperation among stakeholders, including government entities, the private sector, CSOs, nongovernmental organizations, TVET institutions, educators, students, and parents (table 4).

Table 4. Mechanism for stakeholder coordination, summary of responses (%)

Mechanism (responding stakeholder group)	Yes	No
Effective mechanisms for stakeholder coordination (policymakers)	56.52	43.48
Promotion of gender quality in TVET (CSOs)	41.18	58.82
TVET bench marking with other countries (government officials)	35.29	64.71
Advocacy for TVET system improvement (CSOs)	47.06	52.94

Interest in identifying suitable TVET bench marking areas (all respondents)	14.71	85.29
TVET system benefits from sharing of successful African approaches (All respondents)	58.82	41.18
Strong collaborative efforts between CSOs and development partners to support education (CSOs and development partners)	75.76	24.24

Source: IPAR-Rwanda TVET Survey data, 2024.

The study findings present mixed views on the effectiveness of coordination within Rwanda's TVET system. Whereas 56.52% of policymakers believe the coordination mechanisms are effective, 43.48% disagree, indicating a need for stronger partnerships. Regarding gender equality in TVET, 42% of CSOs confirmed efforts to promote gender equality, but 58.8% disagreed, suggesting a gap in CSOs' involvement in this area.

When it comes to TVET benchmarking with other countries, 35.3% of government officials agreed that there is awareness of benchmarking practices, but 64.7% disagreed, indicating a lack of active benchmarking efforts. On government advocacy for TVET system improvement, 47% of respondents agreed that advocacy is being done, but nearly 53% of CSOs disagreed, suggesting insufficient advocacy for TVET development.

Only 14.71% of participants are familiar with TVET benchmarking practices from other countries, and 85% showed no interest in identifying TVET system areas suitable for benchmarking. In addition, 58.8% of respondents agreed that the TVET system benefits from successful African approaches, and 75.8% of CSOs and development partners believe strong collaborative efforts exist between CSOs and development partners to support education.

These findings highlight several areas that require attention to improve the effectiveness and impact of Rwanda's TVET system. 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. Finally, the positive views on successful African approaches suggest that Rwanda could further leverage regional best practices to strengthen its TVET system.

When asked whether the existing coordination platforms ensure the active participation of stakeholders responsible for promoting gender equality and women's empowerment in TVET, respondents from regulatory bodies confirmed that this is the case. Key measures identified include strengthening TVET strategies that address gender disparities and promote equal

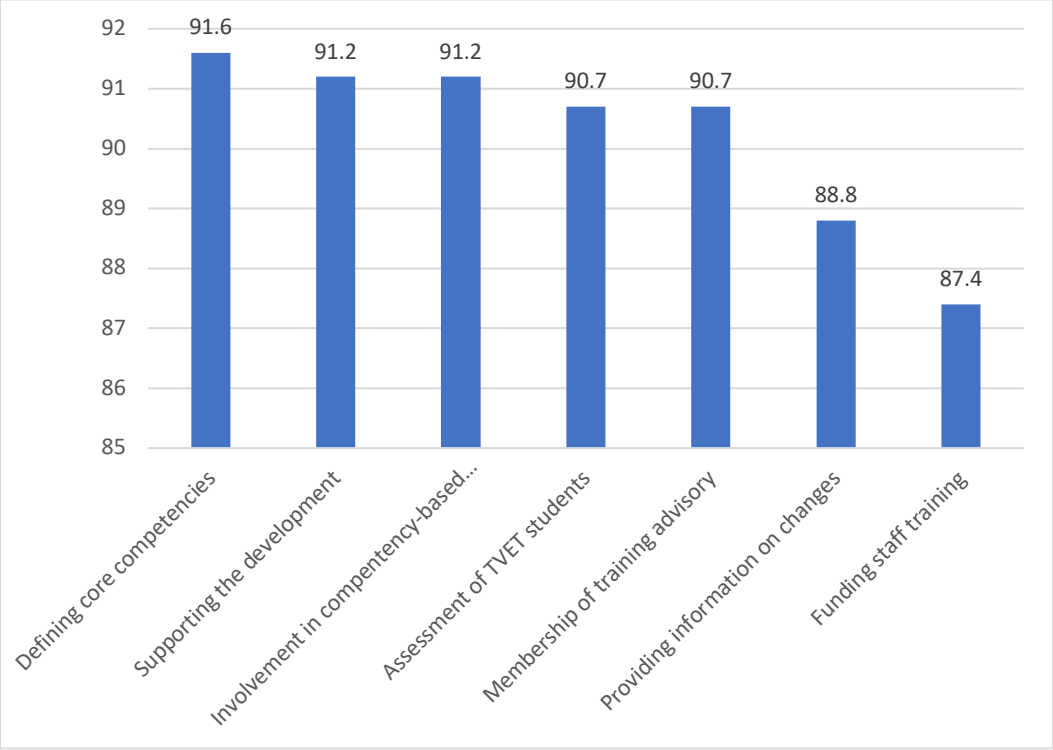
opportunities, implementing gender-sensitive content for inclusivity into TVET programs, and actively encouraging female students to pursue nontraditional fields and participate in a wider range of vocational training opportunities.

4.2. The role of the private sector in revitalizing the TVET system

Melesse et al. (2023) explored the role of the private sector in revitalizing Rwanda's TVET system, focusing on public-private partnerships, industry-led training programs, and infrastructure development. They highlight how private companies contribute to curriculum design and provide students with valuable real-world experience. Chisholm et al. (2021b)emphasize the importance of private sector involvement in shaping TVET systems to ensure that training programs meet the evolving needs of industries, particularly in sectors such as technology, renewable energy, and manufacturing. Munyaneza et al. (2022) demonstrate how Rwanda's TVET sector is using public-private partnerships to improve the quality of education, enhance skills development, and align training with market demands, underscoring the critical role of the private sector in these efforts.

This section presents insights gathered on the role of the private sector in revitalizing the TVET system, drawing from government officials, regulatory bodies, TVET institution leaders, teachers, students, the private sector, and CSOs. Respondents offered diverse suggestions on the role of the private sector in revitalizing the TVET sector in Rwanda (figure 16).

Figure 16. The private sector's role in revitalization of the TVET sector (%)



Source: IPAR-Rwanda TVET survey data, 2024.

Notably, 91.6% of respondents identified defining core competencies and occupational standards for TVET programs as a significant role. This alignment guarantees that the skills imparted in classrooms correspond to industry needs, enhancing graduates' employability and preparedness for the job market. Furthermore, private sector participation in training programs that focus on practical hands-on skill development and involvement in the formulation and revision of frameworks (both 91.2%) prove crucial. This continuous engagement ensures that TVET institutions stay up to date with industry standards and requirements.

Additionally, 90.7% of respondents indicated that businesses are involved in assessing the skills and competencies of graduates, and they participate on advisory boards or sector skills councils, which allows the private sector to influence training policies and curricula. Furthermore, businesses contribute by providing information about workplace changes (88.84%) and funding staff training initiatives (87.44%) to ensure the quality and relevance of TVET programs.

Breaking those findings down by stakeholder category reveals different priorities. Respondents from TVET institutions identified five key roles that the private sector should play in Rwanda's TVET system: defining core competencies and occupational standards, participating in training advisory boards and sector skills councils, updating qualification frameworks, supporting apprenticeship and internship programs, and providing professional development and career guidance.

Employers indicated that they play a crucial role in strengthening TVET by defining industry skills and standards to ensure graduates are job ready. They are also actively involved in developing competency-based training programs that focus on real-world skills aligned with job market needs. Additionally, they provide feedback on the effectiveness of TVET programs and graduate performance, helping maintain relevance and industry standards. Through participation in boards or sector skills councils, they influence TVET curriculum and strategy. Employers also stay updated on industry trends, ensuring that TVET institutions adapt to emerging technologies and better prepare students for the workforce. These contributions underscore the private sector's vital role in shaping a TVET system responsive to industry needs and capable of preparing graduates for successful careers.

4.3. Guidelines for benchmarking national TVET systems

When asked whether Rwanda benchmarks its TVET system against those of other countries, the majority of government officials all agreed that Rwanda does engage in international bench marking of its TVET system. By contrast, development partners expressed some level of uncertainty or disagreement on whether Rwanda benchmarks its TVET with other countries.

The Ministry of Education, through the Skills Development Fund, plays a crucial role in financing TVET projects, enhancing training quality, and ensuring that institutions meet industry standards. This initiative bridges the gap between TVET institutions and the labor market by providing resources necessary to equip students with the skills demanded by employers. By improving TVET

program quality and fostering stronger links with industry needs, the Skills Development Fund enhances graduate employability and ensures students are better prepared for the workforce.

Several frameworks provide guidelines for TVET development, including the following:

- The African Development Bank discusses how African countries can transform their economies through effective TVET systems, offering guidelines for benchmarking policies and programs against international best practices to promote economic growth and job creation (AfDB, 2014).
- The African Union's (2015) Strategy for TVET aims to align African TVET systems with regional standards and labor market needs, promoting employability and economic growth.
- The Commonwealth Secretariat (2017) supports member states, including Rwanda, in strengthening TVET systems by providing tools and frameworks to evaluate performance, adapt curricula, and meet labor market demands.
- The East African Community Secretariat (2017) advocates for harmonizing TVET systems within the region, focusing on improving standards to meet regional labor market demands.
- The European Training Foundation (2020) focuses on enhancing TVET systems in the European Union and neighboring regions, evaluating training relevance, quality assurance, and the alignment of training programs with labor market demands. This approach encourages countries to benchmark.
- The International Labour Organization underscores the importance of strengthening TVET systems in Africa to meet labor market demands, foster inclusive growth, and provide opportunities for vulnerable groups (ILO, 2020). This framework advocates for TVET reforms prioritizing inclusivity, quality training, and market alignment to create pathways to decent work.
- OECD (2016) emphasizes improving TVET systems to address skills mismatches, enhance economic development, and promote lifelong learning. The benchmarking framework helps countries like Rwanda assess the effectiveness of TVET policies to align with global economic trends.
- Sector Skills Councils (2012) focus on developing sector-specific skills and ensuring TVET programs meet industry standards. These councils help bridge the gap between education and employment by aligning curricula with industry needs, ensuring that graduates possess the necessary skills.
- The UNESCO-UNEVOC framework (2019) emphasizes improving TVET systems in developing countries by aligning them with global best practices, enhancing curricula, student evaluation, teacher development, and labor market relevance. This framework aims to foster a skilled workforce capable of responding to both national and global economic demands.
- UNESCO-UNEVOC (2020) provides comprehensive overviews of TVET systems globally, offering benchmarking data to compare Rwanda's system with others, focusing on curriculum relevance, employability, and quality assurance.

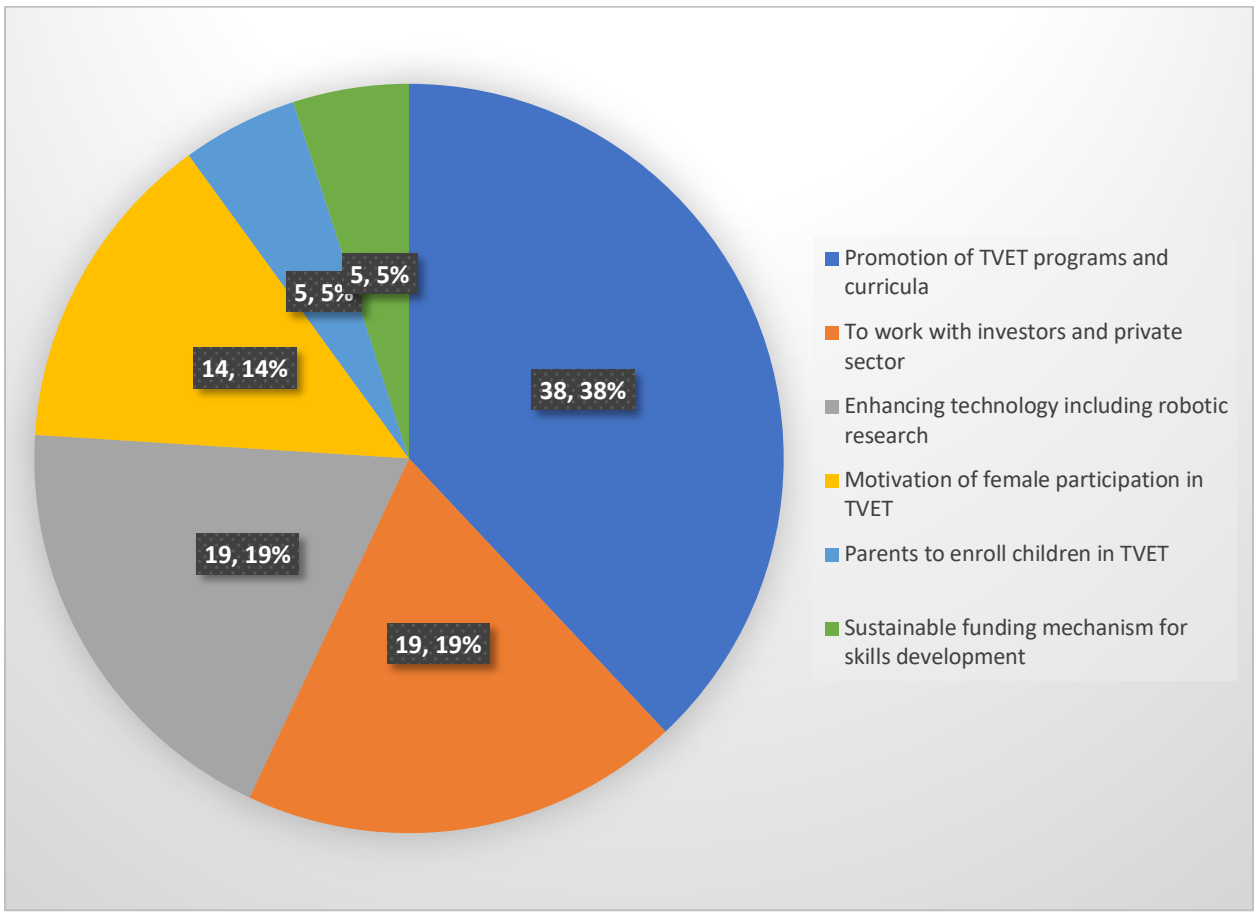
- The United Nations Development Programme (2020) highlights the importance of private sector engagement in TVET. Collaborations through apprenticeships, internships, and direct industry partnerships ensure that TVET programs remain relevant and aligned with labor market demands, ultimately improving graduate employability.
- The World Bank (2019) provides practical guidelines for TVET systems that foster innovation and employability, highlighting TVET's role in driving national economic growth and improving workforce quality. It stresses the need for adaptability and innovation within TVET systems to keep pace with a changing global economy.

These frameworks and reports collectively emphasize the need for TVET systems that are flexible, inclusive, and closely aligned with labor market needs, both locally and globally. By leveraging these guidelines, countries like Rwanda can improve their TVET systems and ensure that their graduates are well-equipped to contribute to economic growth and development.

4.4. Research topics of interest to the development of national TVET systems

This section presents the TVET research topics of interest to the development of national TVET systems in Rwanda, as identified by government officials, regulating bodies, and heads of TVET institutions. The survey asked respondents to propose the three most important research topics that would directly benefit Rwanda's national TVET system. Their responses indicated six major research topics: promoting TVET programs and curricula; fostering collaboration with investors and the private sector; enhancing technology, including the use of robotics in industries; encouraging parents to enroll children in TVET education and changing negative perceptions of TVET; motivating female participation in TVET programs; and establishing sustainable mechanisms for skills development (figure 17).

Figure 17. Topics of interest for further research (%)



Source: IPAR-Rwanda TVET survey data, 2024.

5. Policy Recommendations

Technical and vocational education and training (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. In Rwanda, however, the TVET sector faces challenges such as a lack of quality assurance, outdated equipment, insufficient industry experience among trainers, poor infrastructure, and a negative public perception of TVET. Despite government efforts, employers often express concerns about TVET graduates' competencies. To support Rwanda's socioeconomic growth, this section presents essential recommendations to address these issues and prepare TVET graduates for the labor market. Table 5 presents a framework for the first 14 of these recommendations, indicating a time frame, responsible actors, and key actions.

1. Align TVET programs with labor market needs. TVET curricula must be regularly updated to align with the ever-evolving needs of the labor market, particularly in relation to the Fourth Industrial Revolution (4IR). This alignment can be achieved by creating training programs in collaboration with industry players. Active private sector participation in curriculum design, training, and assessment is essential for ensuring that TVET remains relevant and responsive to the needs of the labor market. Thus, enhancing stakeholder engagement including educational institutions and community organizations in the design and revision of TVET strategies can foster a sense of ownership and improve the relevance of the programs. The barriers to implementing the recommendation to align TVET programs with labor market needs include limited collaboration between industry and educational institutions, insufficient funding and resources, a mismatch between industry expectations and the training capacity of TVET institutions, and a lack of accurate data and market insights.

2. Invest in infrastructure and technology. TVET institutions require significant investment in both physical and digital infrastructures. Enhancing access to technology, especially in rural and underserved areas, is crucial for bridging the digital divide and ensuring that all students have access to modern learning tools. Expanding technology-based courses, such as coding, data analysis, e-learning platforms, and digital marketing, will better equip students to meet the demands of the future job market and ensure they are prepared for the workforce. Barriers to implementing technology in TVET institutions include budget constraints that limit the acquisition of modern equipment and infrastructure, insufficient access to reliable internet and digital devices, and a shortage of qualified instructors to teach technology-based courses. Additionally, resistance from educators unfamiliar with digital tools and a lack of clear government guidelines on technology integration can hinder progress. Aligning local regulations with rapidly evolving technology is also a challenge. Addressing these barriers requires funding, professional development, and policy clarity.

3. Integrate green skills into TVET curricula. With a growing emphasis on sustainability, particularly in sectors like construction, it is important to integrate green skills into TVET programs. By focusing on energy efficiency, renewable energy technologies, and sustainable construction practices, Rwanda's TVET system can equip students with the skills needed to support the country's goals for sustainable development and global environmental efforts. Nonetheless, integrating green skills requires modern infrastructure and equipment, such as renewable energy technologies, energy-efficient tools, and sustainable construction materials. Therefore, many institutions may not have the financial resources to invest in these essential tools.

4. Increase recognition and visibility. Public recognition for their contributions to TVET not only serves as an incentive for companies but also enhances their visibility in the market. This recognition can create a competitive advantage for businesses, making the commitment to TVET both a socially responsible and strategically beneficial decision. At the same time, defining clear and transparent criteria for awarding companies can present a challenge. Without well-established standards, the process may seem subjective, creating perceptions of favoritism or bias, which could undermine the credibility of the awards. Furthermore, if TVET programs lack strong policy backing or consistent government support, the award system may struggle to gain momentum. Without the integration of TVET policies into broader economic or industrial strategies, companies may fail to recognize the relevance of participating in such initiatives.

5. Tailor training programs to meet specific needs of each district: Aligning TVET development with the regional potentials will not only lead to high enrollment rates for both young women and men but will also help tackle the issue of unemployment in Rwanda. Tailoring training programs to the specific needs of each district will help equip youth with relevant skills that meet local industry demands, thereby reducing the skills gap and increasing employment opportunities. This localized approach will create a sustainable pipeline of skilled workers across sectors, support economic growth in each district, and contribute to national development goals. Inevitably, it will promote gender equality, because TVET programs can provide equal opportunities for both genders, empowering women in traditionally male-dominated industries and ensuring that young women and men have access to training in high-demand fields. Through this strategy, Rwanda can harness the full potential of its diverse regions and foster inclusive and sustainable growth.

6. Strengthen early education and foundational skills. Rwanda is already making significant progress in improving education, adapting best practices from countries like Denmark, Finland, Germany, the Republic of Korea, and Singapore. For example, the National Early Childhood Development Policy, introduced in 2011, focuses on creating a nurturing learning environment for young children and promoting the development of foundational skills such as literacy, numeracy, and social-emotional skills. Although these efforts have contributed to improved literacy and numeracy outcomes in later stages of education, respondents identified gaps in foundational skills among both young men and women, making it imperative to increase focus

on science, technology, engineering, and mathematics (STEM). This approach will better equip students for vocational training, ensuring they develop the necessary skills to excel in TVET programs and meet labor market demands.

Potential barriers to implementing this recommendation include the lack of necessary facilities, teaching materials, and trained educators in many schools, particularly in rural areas, to effectively deliver STEM-focused curricula. Additionally, securing funding for teacher training, upgrading educational resources, and providing the technological tools required to engage students in STEM subjects pose a significant challenge to successful implementation.

7. Promote gender equality and inclusivity. Addressing barriers to TVET access for women and marginalized groups is essential. Gender-responsive policies, subsidies, and community engagement programs should be implemented to encourage the participation of young women, rural populations, and individuals with disabilities in TVET. These efforts should focus on providing inclusive training environments and combatting traditional gender roles that hinder access to technical education. However, existing infrastructure and support systems may be insufficient to accommodate the specific needs of marginalized groups, such as accessible facilities for people with disabilities or safe transportation options for rural students. A lack of awareness and sensitivity within TVET institutions and communities regarding gender and inclusivity issues can also hinder progress. Furthermore, limited financial resources or competing priorities may make it difficult to implement gender-responsive policies, subsidies, and community engagement programs.

8. Develop a strong TVET financing strategy. A comprehensive financing strategy for TVET is essential to the system's effectiveness and scalability. The government should allocate sufficient resources to ensure that TVET institutions have the infrastructure, equipment, and qualified educators needed to deliver high-quality training. This priority requires investing in both physical and digital resources to ensure that the TVET system can keep pace with technological advancements and industry needs. One significant barrier to implementing this recommendation is that governments often grapple with competing budgetary priorities, which can limit the resources allocated to TVET institutions. Moreover, existing funding models may not ensure equitable distribution of resources across all TVET institutions, frequently leaving those in rural or underserved regions at a disadvantage. Additionally, creating effective financing strategies necessitates collaboration among various stakeholders, including government agencies, private sector partners, and TVET institutions themselves. A lack of cooperation among these entities can hinder the development of cohesive funding strategies and ultimately reduce the overall effectiveness of financing efforts.

9. Foster entrepreneurial skills and innovation. Integrating entrepreneurial skills into TVET curricula and encouraging an entrepreneurial mindset will not only help students pursue traditional employment but also enable them to create their own business opportunities. By

fostering innovation and entrepreneurial thinking, TVET can contribute to long-term economic growth.

10. Enhance awareness of TVET adaptation mechanisms, and address the negative perceptions of TVET. To bridge the communication gap in TVET, efforts should focus on improving outreach and communication strategies, ensuring that stakeholders are well-informed about the mechanisms for adapting TVET programs to industry demands. Launching campaigns that highlight its role in economic growth and viable career pathways can help address negative perceptions of TVET. Showcasing success stories of TVET graduates will inspire communities and encourage increased enrollment, ultimately fostering a positive view of TVET's impact on individual and national development. Many TVET institutions, however, lack the resources to run effective awareness campaigns, particularly in rural areas, and struggle to showcase visible success stories or role models. Additionally, educators, parents, and community leaders may continue to prioritize academic pathways, making it difficult to shift attitudes and increase TVET enrollment.

11. Expand support for continuous professional development for educators. Equipping educators with the latest industry knowledge and teaching methodologies will ensure that TVET instructors remain informed about evolving market trends, enabling them to deliver relevant and up-to-date training to students.

12. Improve communication and collaboration with civil society organizations (CSOs). Strengthening partnerships between TVET institutions and CSOs is vital for enhancing the TVET system. Addressing issues such as poor communication, limited resources, and differing priorities will help ensure effective collaboration and improve the overall effectiveness of TVET programs. However, barriers to implementing the recommendation include inadequate communication channels between TVET institutions and CSOs, which can obstruct the flow of information and hinder effective coordination of efforts and resource sharing. Additionally, differing priorities, timelines, and approaches between TVET institutions and CSOs can lead to misunderstandings and tension, ultimately diminishing the overall impact of their collaborative initiatives.

13. Provide incentives for hiring TVET graduates. This policy would encourage businesses to offer employment opportunities to TVET graduates, making it easier for graduates to transition into the workforce and for businesses to find skilled workers. A potential barrier to implementing this is that providing tax breaks or financial incentives requires significant government funding, which can be challenging in countries with limited budgets. These funds may face competition from other pressing priorities, making it difficult to secure the necessary resources. Additionally, designing and managing tax incentive programs can be complex, especially in ensuring that companies meet eligibility criteria and that the process remains

efficient and transparent. Additionally, bureaucratic obstacles could hinder the effective implementation of such programs.

14. Support vulnerable groups through vocational training centers. TVET should be a tool for inclusive development, offering opportunities to marginalized groups, including women, rural populations, and people with disabilities. Supporting vocational and technical training centers that cater to these groups will help reduce inequalities in the labor market and promote equal access to skill development programs.

15. Strengthen public-private partnerships. The private sector should play a more active and strategic role in shaping TVET programs to ensure they align with current industry needs and labor market demands. This includes participating in curriculum development, providing real-world training opportunities through internships and apprenticeships, contributing to the design and assessment of competency standards, and offering insights into emerging skill requirements. Enhanced collaboration between public institutions and private enterprises not only improves the relevance and quality of training but also increases the employability of graduates, fosters innovation, and supports national economic growth.

16. Address policy gaps in TVET governance. To build a more effective and inclusive TVET system, it is essential to address existing policy gaps in governance, including by prioritizing the development and use of reliable labor market information to guide decision-making and ensuring that training programs are responsive to current and future workforce needs. Strengthening governance structures within the TVET sector can enhance coordination, accountability, and the efficient allocation of resources. Additionally, policies should actively promote social inclusion and equity, ensuring that persons with disabilities and those from disadvantaged backgrounds have equal access to quality training and employment opportunities.

17. Provide tax incentives and exemptions on duties for training equipment. To encourage greater private sector participation in TVET, governments should consider offering targeted tax incentives and duty exemptions on the importation or purchase of training equipment and materials. These financial incentives can significantly reduce the cost burden for training providers and industry partners, making it more feasible for them to invest in high-quality, up-to-date training infrastructure. By easing financial constraints, such measures can foster stronger engagement by the private sector, improve the quality of training delivery, and ensure that learners have access to industry-relevant tools and technologies.

Table 5. A summary framework for implementing TVET recommendations in Rwanda

No.	Long term (5 + years)	Medium term (3–5 years)	Short term (5–12 months)	Responsible institution/ organization	Key actions

1	Align TVET programs with labor market needs			Ministry of Education, Rwanda TVET Board, Ministry of Labor and Public Service, Ministry of Trade and Industry, and Private Sector	Ensure TVET programs meet the skills and competencies needed by employers and industries.
2.	Invest in infrastructure and technology			Ministry of Education, Rwanda TVET Board, Ministry of Infrastructure, Ministry of ICT and Innovation	Upgrade facilities and integrate technology into TVET institutions to enhance learning outcomes.
3.	Integrate green skills into TVET curricula			Ministry of Education, Rwanda TVET Board, Ministry of Environment, Ministry of Agriculture, and the Rwanda Green Fund	Develop curricula that reflect sustainable and environmentally friendly practices in industries.
4	Provide recognition and visibility for companies Supporting TVET			Rwanda TVET Board, Private Sector Federation, Ministry of Trade and Industry	Strengthen foundational education as a basis for further vocational training.
5.	Tailor training programs to the specific needs of each district			Ministry of Education, Ministry of Trade and Industry, Ministry of Local Government, Rwanda TVET Board, Rwanda Development Board, district authorities, private sector and industry partners	Concerted efforts to ensure that TVET curricula are responsive to local and regional industries, integrating skills needed in agriculture, mining, tourism, fisheries, and other sectors based on the district's comparative advantage. The ministry evaluates the performance of TVET institutions and programs across districts to ensure that training is relevant and effective.
6.	Enhance early education and foundational skills	√		Ministry of Education, Rwanda Education Board, schools and primary education institutions	Foster partnerships between the public and private sectors to improve TVET delivery and employability.
7.	Promote gender equality and inclusivity	√		Ministry of Gender and Family Promotion, Rwanda TVET Board, Ministry of Education, and gender-focused nongovernmental organizations	Ensure equal access to TVET for both men and women, and include marginalized groups.

8.	Develop a strong TVET financing strategy	√		Ministry of Education, Ministry of Finance and Economic Planning, Rwanda TVET Board	Secure sufficient funding for TVET programs and ensure financial sustainability.
9.	Foster entrepreneurial skills and innovation	√		Ministry of Education, Rwanda TVET Board, Ministry of Trade and Industry, Rwanda Development Board	Equip TVET students with entrepreneurial skills to encourage innovation and self-employment.
10.	Enhance awareness of TVET adaptation mechanisms		√	Ministry of Education, Rwanda TVET Board, Ministry of Information Communication Technology and Innovation	Raise awareness on how TVET can adapt to emerging sectors and industries.
11.	Invest in professional development for educators		√	Ministry of Education, Rwanda TVET Board, Rwanda Development Board	Offer continuous professional development programs for TVET educators to improve teaching quality.
12.	Improve communication and collaboration with CSOs		√	Ministry of Education, Rwanda TVET Board, Ministry of Local Government, CSOs	Strengthen collaboration with CSOs to advocate for TVET reforms and ensure inclusive access to vocational education.
13.	Provide tax incentives for hiring TVET graduates		√	Ministry of Finance and Economic Planning, Rwanda Revenue Authority, Private Sector	Introduce tax incentives to encourage the hiring of TVET graduates by the private sector.
14.	Support vulnerable groups through vocational training centers		√	Ministry of Gender and Family Promotion, Ministry of Education, Ministry of Local Government, Rwanda TVET Board	Provide targeted support for vulnerable groups to access TVET programs and vocational training centers.
15	Strengthen public-private partnerships		√	Ministry of Education, Ministry of Public Service and Labour, Rwanda TVET Board and the Private sector Federation	The private sector should play a more active role in shaping TVET programs.
16	Address policy gaps in TVET governance		√	Ministry of Education, Rwanda TVET Board, Rwanda Polytechnics	**P**rioritize improving labor market information, enhancing

					governance in the TVET sector, and promoting social inclusion and equity.
17	Provide tax incentives and exemptions on duties for training equipment	√		Ministry of Finance and Economic Planning, Ministry of Commerce and Industry, Rwanda Revenue Authority	Providing targeted incentives to ease financial constraints and foster greater engagement.

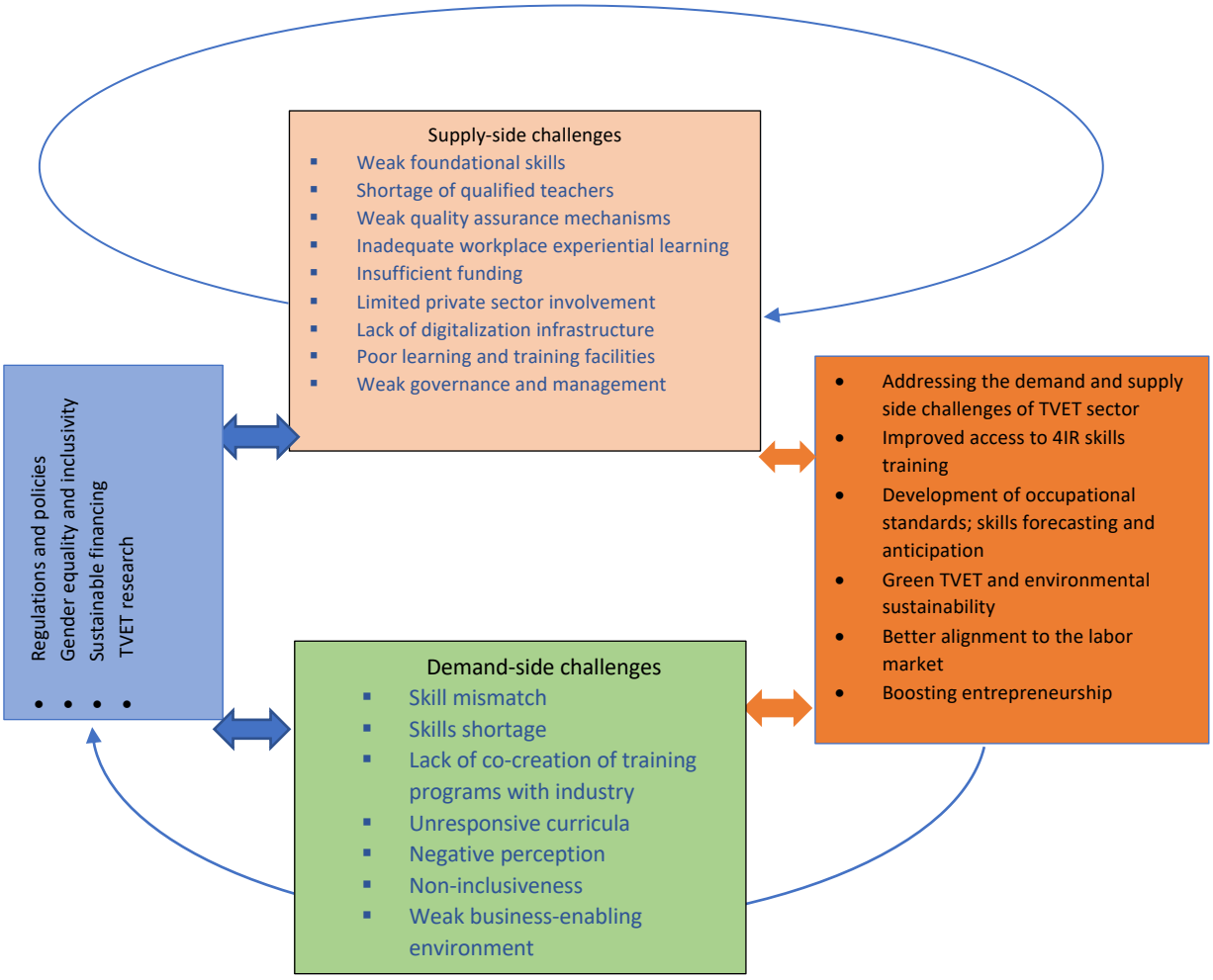
Source: IPAR-Rwanda TVET survey data, 2024.

The overall responsibility for implementing these recommendations rests with a collaboration between key government ministries (especially the Ministry of Education, Rwanda TVET Board, and Ministry of Finance), the private sector (for public-private partnerships and tax incentives), and CSOs, with specific roles attributed to each stakeholder in areas such as infrastructure, curriculum development, gender inclusivity, and access to TVET for vulnerable groups. Through this structured framework, Rwanda can transform its TVET system into a driving force for economic development, aligned with national goals and responsive to both current and future labor market demands.

Appendix A. Analytical Framework

Figure 18 provides the analytical framework underpinning the study. Policies and regulations are fundamental drivers of alignment of the TVET education and skills development systems to the changing world of work. They drive the supply, quality, and relevance of the workforce in response to rapidly changing labor market demands. Thus, aligning the supply-side factors to the demands of the labor market, such as critical thinking, analytical, and soft skills.

Figure 18. Analytical framework



Source: Adapted from ACET, 2024.

The study qualitatively examined the interaction between the demand and supply sides challenges to identify gaps between the present state of supply and the expectations from the demand side as they move toward adapting to the changing nature of work. Supply refers to the present and near-term supply of labor and covers youth (that is, students, fresh graduates,

employed persons, and those not in education, employment, or training). Demand refers to employers who use these resources to produce output. Understanding the key challenges will help understand the outcome that is—defined as the "improved ability for demand and supply side stakeholders to adapt to the changing nature of work."

The two circular arrows in figure 18 represent that the use of regulations and research to drive policy reform is a continuous process, and the ideal goal is to reduce the time taken for each of these loops to complete—that is, reduce the time and strengthen the capacity for the market to adapt to changing technology.

Appendix B. Methodology and Approach

The methodology for this study is based on the ACET Policy Engagement Model, which uses research and policy dialogue to identify common problems and challenges faced in a particular area by multiple countries and also identify examples of best practices in one or more countries that can be shared with other countries.

Under this model, ACET conducts multicountry case studies in a critical policy area, working with country-based experts or think tanks. This process leads to a primary report for each country in the study. The reports are then validated in the country as part of an event that brings together policymakers, the private sector, and key stakeholders to discuss findings, recommendations, and possible implementation follow-ups. ACET also produces a synthesis report that identifies overarching issues pertinent to the countries in the multicountry study. These reports provide a motivation to bring together the individual countries—as well as relevant stakeholders—to discuss ways forward.

Based on the ACET Policy Engagement Model, the study was organized into four phases over a period of 18 months:

- **Phase 1** involved all the preparatory activities leading to and including the inception meeting with country researchers' feedback. This phase included a detailed stakeholder mapping exercise to identify the key stakeholders to engage in each study country.
- **Phase 2** covered fieldwork leading to country studies.
- **Phase 3** covered the final synthesis report based on country studies and the outreach or dissemination plan.
- **Phase 4** focused on policy uptake, policy learning events, and the launch of the TVET study.

Data collection. Tables 6 and 7 summarize the documents reviewed and the key sources of information on Rwanda's policy and TVET landscape.

Table 6. Desk review

	Reports from government entities	**Reports from international organizations**	**Journal articles**	**others**
Desk review	Ministry of Education	World Bank	Published papers	
	Ministry of ICT Rwanda TVET Board Rwanda Education Board	International Labour Organization United Nations educational, scientific culture organization	International peer review journals Theses/ Dissertations	

Table 7. Secondary data

Sources	Key data/variable
Ministry of Education	Share of TVET budget (% of total budget or education budget) Rwanda Education Sector Policy Strategic Plan 2019–2024
Rwanda Education Board	Number of TVET schools Enrollment percentage into TVET schools
Rwanda TVET Board	Percentage of enrollment into TVET schools
Rwanda Development Board	National Skills Development Policy National Employment policy National Skills Development and Employment Promotion Strategy 2019–2024
Ministry of Youth	National Youth Policy
Private sector	Public private partnerships Innovation and entrepreneurship challenges, TVET education
Ministry of Education on TVET challenges and opportunities	High risk of cybersecurity interruption Skilled workforce for industry Job placement and employability Entrepreneurship and innovation Social mobility and poverty reduction

Sample. The study employed purposive stratified sampling to ensure the collection of representative and gender-disaggregated data across various stakeholder groups, considering factors such as location (rural/urban), gender (male/female), and sectors. Tables 8 through 13 list study participants by stakeholder group.

Table 8. Private sector participants

Stakeholder	Sector	Firm subsector	Sample size
Private sector	Manufacturing sector	Building and construction materials	1
		Agro-processing	1
		Textiles and apparel	1
		Automotive and metal fabrication	1
		Wood processing	1

Stakeholder	Sector	Firm subsector	Sample size
		Electrical and electronics	1
	Services	Construction and maintenance	1
		ICT	1
		Tourism and hospitality	1
		Automotive repair and maintenance	1
		Logistics, transportation, and warehousing	1
	Agriculture	Agribusiness and commercial farming	1
		Horticulture	1
		TOTAL	**14**

Table 9. Participating government officials

Stakeholder	Ministry/Agency	Representative	Sample size
Government officials	Ministry of Education	Minister of State in charge of TVET and ICT/TVET/ TVET specialist	2
	Ministry of Public Service and Labor	Director general of skills development and employment promotion / specialist labor market inspectorate	2
	Ministry of ICT	Director general ICT policy and planning/ director general of ICT	1
	Ministry of Commerce and Industry	Director general skills development and training	1
	Ministry of Youth	Director general employment and entrepreneurship promotion	1
	Rwanda Development Board	Chief skills officer/ employment and labor market specialist	1
	Rwanda Education Board	Head of ICT Head of curriculum development and learning	2
	Rwanda TVET Board	Monitoring and evaluation specialist	1
		TOTAL	**12**

Table 10. Participating TVET institutions and students

Stakeholder	Type of institution		Representative	Sample size
TVET institutions, students, and teachers	Technical colleges		Public institutions	2 per district
			Private formal institutions	2 per district
			Private informal institutions	2 per district

			Male students	2 per district
			Female students	2 per district
			Students with disabilities	1 per district
			Male teachers	2 per district
			Female teachers	2 per district
	Vocational and training centers		Public institutions	2 per district
			Private formal institutions	2 per district
			Private informal institutions- VTCs	2 per district
			Male students	1 per district
			Female students	1 per district
			Students with disabilities	1 per district
			TOTAL	**10 districts 30 FGDS and 30 KIIs**

Table 11. Parent participants

Stakeholder	**Stratification**	**Target firm/person**	**Sample size**
Parents	Public institutions (2)	Men	2
		Women	2
	Private formal institutions (2)	Men	2
		Women	2
	Private informal institutions (2)	Men	2
		Women	2
		TOTAL	**12**

Table 12. Participating regulatory bodies

Stakeholder	**Stratification**	**Target firm/person**	**Sample size**
Regulatory bodies	Ministry of Education Rwanda TVET Board Rwanda Polytechnic		
		Permanent Secretary	1
		Director General	1
		Vice-Chancellor	1
		TOTAL	**3**

Table 13. Civil society organizations

Stakeholder	Stratification	Target firm/person	Sample size
CSOs	Skills development	African Evangelistic Enterprise	1
	Advocacy	World Vision	1
	Service delivery	Imbuto Foundation	1
	support	Catholic Relief Service	1
	Gender/women focused	Profemmes Twese hamwe, Forum for African Women Education	1
		Subtotal	***5***
Development partners	International Labour Organization		1
	World Bank		1
	Swiss Agency for Development and Cooperation	Representative	1
	German Development Agency (GIZ)	Representative	1
	African Development Bank	Representative	1
	Japan International Cooperation Agency	Representative	1
	Belgian Development Agency	Representative	1
	Korea International Cooperation Agency	Representative	1
	UNDP-Rwanda	Representative	1
	UNESCO	Representative	1
	USAID	Representative	1
	UN WOMEN	Representative	1
	Imbuto Foundation	Representative	1
	International Computer Driving License		1
		Subtotal	***14***
		TOTAL	**19**

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