



**STRENGTHENING EDUCATION AND
LEARNING SYSTEMS TO DELIVER
A 4IR-READY WORKFORCE**

RWANDA
COUNTRY REPORT



The African Center for Economic Transformation (ACET) is a pan-African economic policy institute supporting Africa's long-term growth through transformation. We produce research, offer policy advice, and convene key stakeholders so that African countries are better positioned for smart, inclusive, and sustainable development. Based in Accra, Ghana, we have worked in nearly two dozen African countries since our founding in 2008.

Ghana

Office location:

7 Yiyiwa Drive
Abelemkpe, Accra - Ghana
Phone: +233 (0) 0242436858

Mailing address

Cantonments PMB CT 4
Accra, Ghana

Contact us:

E-mail:
info@acetforafrica.org

Web:
acetforafrica.org

United States

Office location:

1776 K Street, NW Suite 200
Washington DC 20006
Phone: +1 202 833 1919

Copyright © 2022 African Center for Economic Transformation
Photos courtesy of iStock (www.istockphoto.com)

ACKNOWLEDGMENTS

The Mastercard Foundation supported this paper as part of its strategy on youth employment in Africa. This report was prepared by an ACET team led by Edward K. Brown, ACET Senior Director of Research, Policy and Programs, and Mona Iddrisu, ACET Head for Youth Employment and Skills, with special thanks to Rik Moors, Nii K. Bentsi-Enchill, and Jason Thompson for editorial support. The report is an abridged version of the full country report prepared by a team from the Institute of Policy Analysis and Research (IPAR).

We would like to express our profound thanks and gratitude to the IPAR team led by Dr. Dickson Malunda for their collaboration with ACET and for serving as the country lead in preparation of the full country report, including primary data collection (individual surveys and focus group discussion).

The authors would also like to thank the participants of the validation workshop held in Kigali on youth employment and skills for their insights.

TABLE OF CONTENTS

Acronyms	2
Executive Summary	3
Part 1. Study overview	5
1.1. Background to the study	5
1.2. Objectives of the study	6
1.3. Analytical framework	6
1.4. Methodology	7
Primary data collection	7
Stakeholder mapping.....	8
Part 2. Country overview	9
2.1. Labor and the socio-economic environment.....	9
2.2. Overview of the education system.....	11
Enrollment	12
Gender and STEM education.....	12
Curricula and pedagogy.....	12
Digital skills.....	13
Policy environment.....	13
Part 3. Supply-side perspectives	15
3.1. Access to secondary education and skills training.....	15
Curriculum.....	15
Technology skills gaps.....	16
Continuous professional development	16
Career guidance.....	16
Physical and digital infrastructure.....	17
Life-long learning.....	17
Labor forecasting.....	18
3.2. Quality and relevance of supply-side levers.....	18
Curriculum.....	18
Career guidance.....	18
Life-long learning.....	19
Physical and digital infrastructure.....	19
3.3. Policies aimed at improving quality and relevance.....	19
3.4. Challenges in improving relevance and quality of education.....	20

Part 4. Demand-side opportunities and constraints 21
4.1. Curriculum development.....21
4.2. Internship programs21
4.3. Continuous learning.....22
4.4. Gender equality23
Part 5. Conclusions and policy recommendations..... 24
References 26

ACRONYMS

4IR	Fourth Industrial Revolution
CBC	Competency-Based Curriculum
ICDL	International Computer Driving License
ICT	Information and Communications Technology
INSET	In-service Teacher Training
KBC	Knowledge-Based Curriculum
NEET	Not in Education, Employment, or Training
NISR	National Institute of Statistics Rwanda
NST1	National Strategy for Economic Transformation
RDB	Rwanda Development Board
REB	Rwanda Education Board
RURA	Rwanda Utilities Regulatory Authority
RYAF	Rwanda Youth in Agribusiness Forum
STEM	Science, Technology, Engineering, and Mathematics
TVET	Technical and Vocational Education and Training
WDA	Workforce Development Agency
YES	Youth Employment and Skills



Executive Summary

Although formal sector job creation in Rwanda has been impressive over the last 20 years, it has not kept pace with the increased number of secondary and tertiary school graduates, a rise fueled by a number of factors: improved access to education, a skills mismatch between labor supply and demand, and inadequate growth in productive jobs. Indeed, a large share of the growth outside the dominant agricultural sector in the past few decades has been in household enterprises—unincorporated, non-farm businesses owned by individuals—rather than the modern, industrial, or services enterprises that would be expected—and necessary—for sustainable growth and economic transformation.

Rwanda's working-age population has increased gradually from 4 million in 2000 to approximately 6.7 million in 2018 (National Institute of Statistics of Rwanda, 2018). This has been complemented with an increase in both the employed and unemployed labor units. With a median age of 19 years, the population is very young, and this demographic profile will persist for the coming decades. However, the predominantly low levels of education threaten the expected demographic dividend. This is manifested by the high percentage of youth not in education, employment, or training (NEET), at 33.7 percent. Rates are significantly higher for women than men.

Given the high level of unemployment in Rwanda and other African countries, the Fourth Industrial Revolution (4IR) presents opportunities—if effectively harnessed—but also challenges for countries that must be well prepared in advance. The overarching objective of this study is to examine those challenges and opportunities in Rwanda as they relate to youth, employment, and skills. The study reviews the structure and composition (demographic, education, and skills) of the workforce as well as the policies, regulations, and institutional arrangements aimed at implementing innovative education and training initiatives and boosting employment opportunities for youth. It discusses digital technologies, job creation, and the skills needed for 4IR.

Based on the overarching issues that emerged from the study, several key policy recommendations can be made to strengthen education and learning systems in Rwanda to deliver a 4IR-ready workforce.

Upgrading skills of teachers, trainers, and lecturers. Teachers in Rwanda face big challenges in the implementation of the country's competency-based curriculum (CBC), which requires a very different pedagogy and approach in the classroom compared to the knowledge-based curriculum (KBC), including greater knowledge of information and communications technology (ICT) tools.

Improving access to ICT and the quality of digital infrastructure. Strong digital infrastructure is a cross-cutting enabler that offers numerous opportunities across the labor market. The Ministry of Education should focus more on developing digital content aligned to the curriculum and boost increased ICT penetration and usage in education.

Enhancing teachers' English skills for improved instruction. Insufficient English language skills among teachers in secondary schools, technical and vocational training (TVET) institutions, and higher learning institutions negatively impact learning outcomes. The Ministry of Education should make a review of the existing policies on language management systems and invest in further language training for teachers.

Strengthening the links between industry and the education system. This study identified weak links between industry and educational institutions. The government should implement initiatives to directly link the quality and relevancy of programs with the labor market. The private sector needs to have a more significant role in providing training and development for new employees.

Improving the quality and relevance of TVET. Employers are generally unsatisfied with the skill level of TVET graduates. As a result, securing employment for those graduates remains a challenge. The private sector needs to be involved from the initial stages of curriculum design, and employers should participate in innovative training systems, career guidance, and counseling services. Expanding TVET enrollment and making it a more attractive and viable alternative educational pathway—which includes changing negative perceptions—is critical.

Expanding recognition of skills acquired in the informal sector. Employees in the informal sector—such as those trained and employed in carpentry, construction, hairdressing, and more—are often equipped with all the necessary competencies to compete favorably with graduates from technical institutes. However, these practical skills acquired in the labor market need to be officially recognized.

Increasing the budget allocation to the education sector. Schools, colleges, and training institutions remain significantly underfunded. This has particularly affected the quality of science education and access to the secondary school system. The government should increase funding for education, and the Ministry of Education should increase the budget for laboratory equipment and distribute more textbooks. Increased funding would also allow for the development of focus areas, including capacity and professional development and management training for teachers across all levels of education.



Part 1. Study overview

1.1. Background to the study

This study is part of a six-country project on Youth Employment and Skills (YES) and the changing nature of work. The project examines education and training systems and their ability to adjust to meet evolving labor demand in light of rapidly evolving digital technologies and the Fourth Industrial Revolution (4IR). The six countries are Côte d'Ivoire, Ethiopia, Ghana, Niger, Rwanda, and Uganda.

The project evaluates the policies, regulations and institutional arrangements aimed at boosting educational outcomes and employment opportunities, especially job creation using innovative education and training initiatives.

For the last two decades, African countries have focused on reducing costs, improving investment climates, and attracting labor-intensive manufacturing to capitalize on an abundance of labor, hasten economic growth, and to provide productive jobs. However, these business climate reforms have not generated adequate productive jobs to match the increasing number of new labor market entrants, the majority being youth workers.¹

In Rwanda, the unemployment rate within the total population stands at 21.1 percent in 2021 (National Institute of Statistics of Rwanda, 2022), which is relatively high. Although formal sector job creation has been impressive over the last 20 years, it has not kept pace with the increased number of secondary and tertiary school graduates, a rise fueled by a number of factors. First, there is rapidly improved access to education in Rwanda; so many more people are going to school. Second, where job demand in the formal sector does exist, skill mismatches are a problem.² This is due in large part to the specialization of degrees in subject areas (such as arts and humanities) that do not align with employer labor needs (such as specializations in science and technology). Third, the impressive economic growth has not generated adequate growth in productive jobs. Rather, a large share of the growth outside the dominant agricultural sector in the past few decades has been in household enterprises—unincorporated, non-farm businesses owned by individuals—rather than the modern, industrial, or services enterprises that would be expected—and necessary—for sustainable growth and economic transformation.

Given the high level of unemployment in Rwanda and other African countries, the new 4IR technologies present opportunities—if effectively harnessed—but also challenges for countries that must be well prepared in advance.

1 For the purpose of this study, youth refer to those between the ages of 18 and 35, as defined by the African Youth Charter.

2 Skill mismatches occur when existing skills and training in the workforce do not adequately meet the skills demanded by employers.

1.2. Objectives of the study

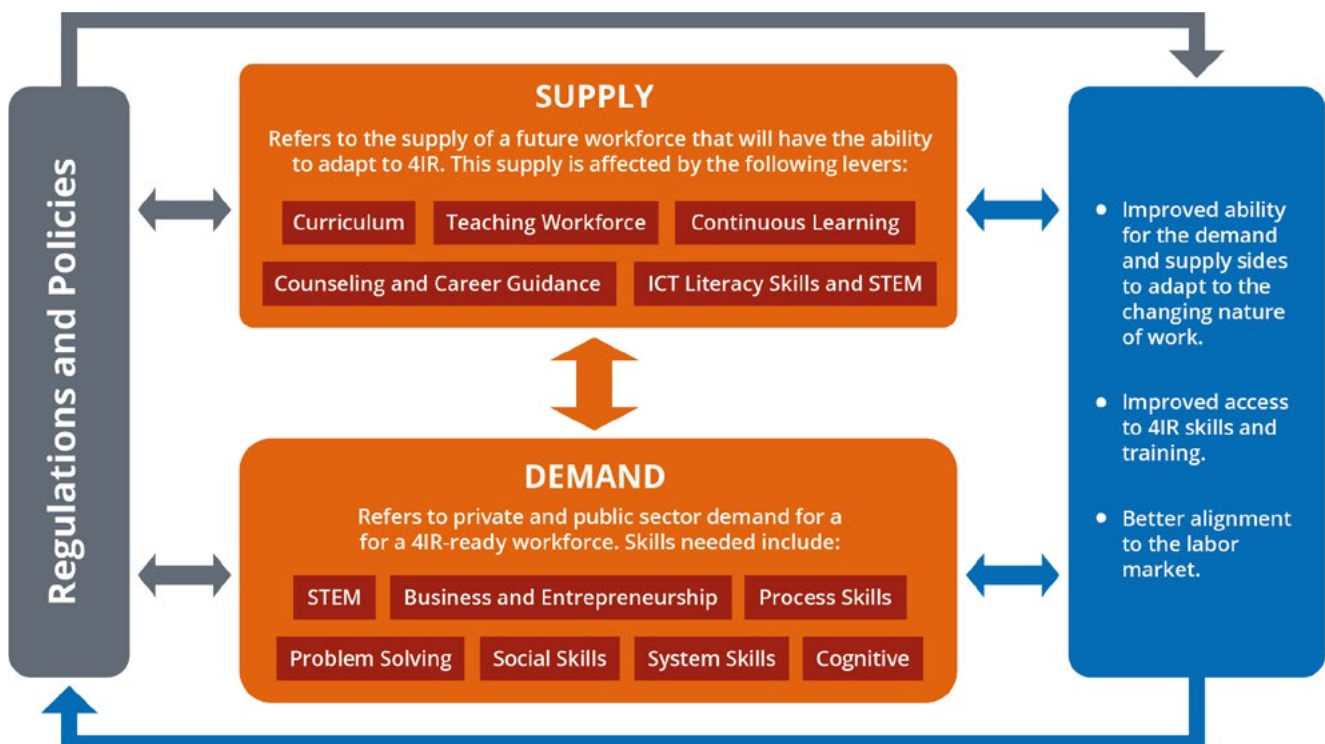
The overarching objective of the study is to examine the YES challenges and opportunities in Rwanda. The study reviews the structure and composition (demographic, education, and skills) of the workforce as well as the policies, regulations, and institutional arrangements aimed at implementing innovative education and training initiatives and boosting employment opportunities for youth. It discusses digital technologies, job creation, and the skills needed for 4IR. The study focuses on four main questions:

1. How is labor demand in industry changing in the face of digital technologies?³
2. What is the current level of mismatch between labor supply and the demand for skills, and what are the implications for employment?
3. How are education and training systems responding to the changing nature of work in Rwanda?
4. What role is industry playing to ensure that education and training systems are producing the right workforce?

1.3. Analytical framework

Figure 1 provides the analytical framework for the study. Policies and regulations are fundamental drivers for alignment of the education and skills development systems with the changing world of work. They influence the supply, quality, and relevance of the workforce in terms of hard skills as well as crucial soft skills such as critical thinking, analysis, problem-solving, and communication.

Figure 1. Analytical framework



³ In this study, the term “industry” refers to agriculture, manufacturing, and services.

The study examines how the following five education-related levers drive supply and demand factors:

- Ensuring the alignment of curricula with the changing needs of the labor market.
- Investment in developing and maintaining a professional teaching workforce ready for 4IR-relevant pedagogical approaches, skills, and subjects.
- Early exposure to the workplace through internships and apprenticeships, with early access to career guidance counselors and career fairs.
- Physical and digital infrastructure development for safe buildings, high access to computers and internet, and frequent classes to develop ICT skills.
- Creating a culture of lifelong learning, with both demand and supply sides ready to continuously adapt to changing skills demands.

Supply refers to the present and near-term supply of labor and covers youth—i.e., students; fresh graduates; employed; and those not in education, employment, or training (NEET)—while demand refers to employers who use these human resources for production.

The top and bottom arrows in Figure 1 represent the use of regulations to drive reform in a continuous process aimed at reducing the time and strengthening the capacity for the market to adapt to new technology. Access to education is defined as physical (distance, facilities, human resource) but the costs (tuition uniforms, transportation, feeding) and the socio-cultural norms that govern access are also considered. From a financial aspect, school attendance is sometimes discouraged due to the fact a young person attending secondary school can be seen as a source of income loss from labor activities, particularly in rural areas.

This study also explores the key drivers and challenges to education access and examines the quality and relevance to the workforce of each of these education levers, with inputs and recommendations from the demand and supply sides.

1.4. Methodology

Primary data collection

The study brought together insights from key informant interviews and desk reviews. Primary data was collected using interviews with policymakers in education and technical training, labor regulations and services, school administrators in secondary education, higher learning institutions, development partners, and youth development and training centers. Participant observation was also done to understand classroom teaching and ascertain the linkages between the information from interviews and the physical functioning of the equipment and delivery in teaching and learning.

A framework to guide the analysis of the data was represented by a schematic tabula that examined the cases from the interview guide questions for each sector. Each question was analyzed by identifying who says what and where, the duties and responsibilities of the interviewee, and success stories. Data was then coded and analyzed thematically. Thematic analysis was employed by putting emphasis on what was said rather than on how it is said. Findings from key informant interviews and focus group discussions guided the entire analysis.

Stakeholder mapping

The study covers Gasabo, Kicukiro, and Nyarugenge districts in the city of Kigali and six districts in the remaining four provinces in the country: Rwamaga and Bugesera districts in Eastern province; Muhanga and Huye districts in the Southern province; Musanze in the Northern province; and Rubavu district in the Western province. Stakeholder mapping was undertaken to identify a representative pool of potential respondents. A non-probability sample was used purposely to emphasize that during sample selection, random sampling was ignored but rather to emphasize the point that some units in the population are more likely to be selected than others.

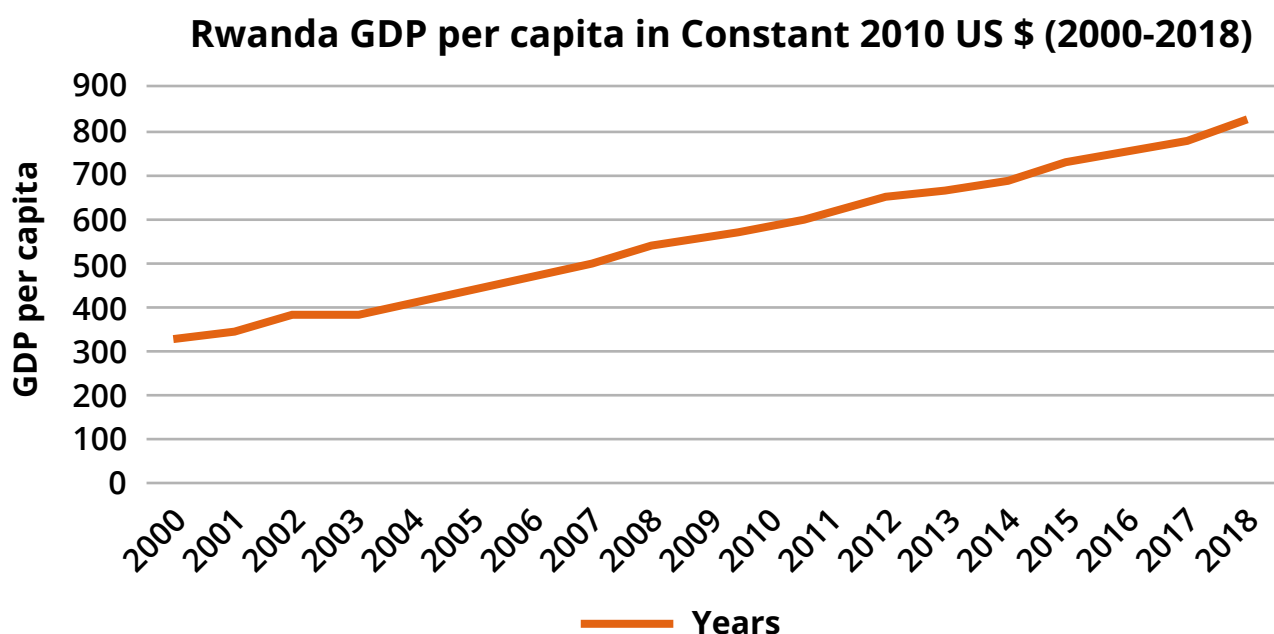
Part 2. Country overview

This section outlines the demographic and labor force composition of the Rwandan population as a whole, with specific attention on the youth. The information is disaggregated by sex and age.

2.1. Labor and the socio-economic environment

Rwanda's economy has expanded significantly in the last two decades. The expansion has been founded on consistently high growth rates averaging approximately 8 percent, ranking it above the Sub-Saharan average growth rate.

Figure 1. Rwanda GDP per capita, 2000-2018 (constant US\$)



Source: (Malunda, 2020)

The working-age population has increased gradually from 4 million in 2000 to approximately 6.7 million in 2018 (National Institute of Statistics of Rwanda, 2018). This has been complemented with an increase in both the employed and unemployed labor units. The total labor force participation rate has ranged between 80-86 percent, while the employment to population ratio is 86 percent. The inactive rate increased tremendously in 2016 because the unemployed were reclassified as inactive.

With a median age of 19 years, the population is very young, and this demographic profile will persist for the coming decades. However, the predominantly low levels of education threaten the expected demographic dividend. This is manifested by the high percentage of youth not in education, employment, or training (NEET), currently standing at 33.7 percent, having reduced from 35.9 percent in the last decade. Rates are significantly higher for women, with 43 percent NEET compared to the 23.5 percent of men not in employment or education.

Table 1. Labor market indicators and trends. Selected indicators, Rwanda, 2000–2017 ('000)

Indicator ('000)	2000-01	2005-06	2010-11	2013-14	2016-17
Working age population ('000)	4118	5116	5888	6400	6756
Employed	3571	4299	4783	5479	5,825
Unemployed	59	81	110	112	109
Inactive	488	735	994	810	931
Labor force participation rate	88.1	85.6	83.1	87.4	87
Employment to population ratio	86.7	84	81.2	85.6	86

Source: (Malunda, 2020) based on the EICV4 surveys

Table 2. Percentage of NEET by age group and sex (EICV 3 & 4)

Age group	2010-11			2013-14		
	Male	Female	Total	Male	Female	Total
16-19	15.4	20.5	18	16.9	21.8	19.4
20-24	26.7	47.6	37.9	23.1	45.1	34.6
25-30	35.1	62.3	49.7	29.9	58.7	45.2
Total (16-30)	25.9	44.7	35.9	23.5	43	33.7

Source: Integrated Household Living Conditions Survey, NISR (2011, 2014, 2017)

Rwanda's labor force has low levels of education, with the majority of workers having primary as the highest level of education. There has been a slight decline of approximately 1 percent in the number of persons with no education, an equivalent increase in lower education and upper secondary education, and a slightly smaller growth in tertiary education (National Institute of Statistics Rwanda, 2017).

The marginal increase is partly due to the long span required to realize outputs of education investment. Nevertheless, in the last decade, the government has invested enormously in education through free 9- and 12-year basic education, although the outcome of this approach has not been evaluated.

4 EICV surveys denote Integrated Household Living Conditions Survey. EICV 3 & 4 are the Integrated Household Living Conditions Surveys conducted in 2010-11 and 2013-14 periods.

Table 3. Level of Education attained (EICV 3-5), Rwanda

Level of education attained	Counts (000)			Percentages		
	2010-11	2013-14	2016-17	2010-11	2013-14	2016-17
None	1143	966	966	19.42	17.42	16.4
Primary not completed		2,520	2,546		45.45	43.3
Attended but no qualification	2635			44.76		
Primary completed	1426	1,388	1,471	24.22	25.03	25
Post-primary		81	76		1.46	1.30
Vocational	104		93	1.77		1.6
Lower secondary	268	217	347	4.55	3.91	5.9
Upper secondary	200	248	207	3.40	4.47	3.5
University	102	125	173	1.73	1.4	2.9
Unknown	9			0.15		

Source: Integrated Household Living Conditions Survey, NISR (2011, 2014, 2017)

Note: Blank cells represent missing data and were not provided in the source datasets.

2.2. Overview of the education system

The structure of the education system in Rwanda is as follows: pre-primary education is organized in nursery schools for three years for children between the ages of three and six. Primary education lasts six years; the official primary school age is from 7 to 12 years. Primary education ends with a national examination, which yields eligibility for lower secondary education studies.

Pupils enroll in secondary education at the age of 13 and schooling lasts six years. The secondary system is composed of lower secondary (the first three years) and upper secondary (the second three years)—both ending with a national examination that yields eligibility for upper secondary and tertiary education studies, respectively. Upon completing lower secondary, students enter different fields of study such as sciences, humanities, languages, teacher training, or technical studies.

Technical and vocational education and training (TVET) is taught in technical secondary schools, vocational training centers, and technical tertiary institutions (awarding diplomas and advanced diplomas). TVET is intended to provide both young and unemployed people with the skills to gain productive employment. Vocational training also allows workers and entrepreneurs the opportunity to upgrade their skills.

Tertiary education uses a credit accumulation and modular scheme (CAMS) system. The Rwandan Higher Education Qualifications Framework lays out the qualifications awarded at different tertiary education levels. The framework has seven levels of exit awards: Level 1, certificate of education;

Level 2, diploma in higher education; Level 3, advanced diploma in higher education; Level 4, ordinary degree; Level 5, bachelor's degree with honors; Level 6, master's degree; and Level 7, doctorate.

Enrollment

According to the 2018 education statistical yearbook, most of the students enrolled in Rwanda's education system are in primary schools, and these comprise 69 percent of total enrollment. Secondary school enrollment accounts for the second largest proportion of enrollment at 16 percent. Tertiary education accounts for 2 percent of total enrollment, while vocational education and adult literacy centers account for about 13 percent combined. A substantial number of students enrolled in primary and secondary schools drop off before moving to tertiary and vocational education. Considering this, interventions to prepare the youth for 4IR readiness need to take into account the low skills base before upgrading higher-level skills.

A breakdown of enrollment by gender at the different stages of Rwanda's education system shows that there is near gender parity at the primary and secondary levels. However, male students are over-represented at the tertiary and vocational levels, implying that more efforts are needed to achieve gender parity at these two levels. Lastly, female students significantly outnumber male students at the adult literacy level.

Gender and STEM education

Although Rwanda has put forward numerous interventions to tackle the underrepresentation of women and other groups in science, technology, engineering, and mathematics (STEM), women still obtain smaller fractions of all university degrees and careers in these fields than their male counterparts.

Figures indicate varying patterns in the number of girls across different fields of education from 2000 to 2018. For example, 51.7 percent of those enrolled in secondary school are girls, and 55.1 percent of those studying STEM are girls, while 45.1 percent of those studying in TVET schools are girls. Additionally, 8.16 percent of undergraduate students in STEM subjects are girls. Across all fields of education, the number of females is greater than that of males, except in technical secondary schools (Rwanda Education Statistics Yearbook, 2018).

However, the proportion of female students taking STEM subjects in higher education is significantly lower than that of male students, and there is no evidence that the ratio is increasing. Furthermore, women constitute only 3 percent of the academic staff from STEM fields (Ministry of Education, 2013).

Curricula and pedagogy

Rwanda has embarked on curriculum reform to improve the quality of education and to "develop a knowledge-based society and the growth of regional and global competition in the jobs market" (REB, 2015). An important shift has been to move away from a knowledge-based curriculum (KBC) to a competency-based curriculum (CBC), and from knowledge and skills acquisition to knowledge creation and application. The aim is to develop students' independent, life-long learning habits, appropriate skills and knowledge, and applications to real-life situations. There is a growing recognition of the potential of competency-based education, unlike traditional subject and

content-based education, to develop the capabilities and competencies that are deemed essential for success in both academia and today's knowledge-based economy (Darling-Hammond, 2012; Scardamalia et al., 2012).

Digital skills

All 29 public and private higher learning institutions offer ICT-related courses. Universities offering ICT courses concentrate on Bachelor of Science in computer science or computer engineering, information technology, electronics, and communication systems. Most of these programs focus on fundamental aspects of computer management and engineering at the undergraduate level. So far, universities have been unable to diversify their undergraduate and post-graduate academic programs towards specializations in key emerging ICT areas in line with government priority programs (see below).

Policy environment

One of the priorities under the Economic Transformation pillar of Rwanda's National Strategy for Transformation (NST1) to spur economic development is to create 1.5 million jobs, which translates into over 214,000 decent and productive jobs annually. To achieve these ambitious targets, the NST1 set out the following strategies, which highlight the importance of TVET and youth employment services in Rwanda:

1. Mainstream employment planning into all key sectors of the economy and strengthen the coordination, implementation, and monitoring of the National Employment Programme.
2. Develop a mechanism to support at least one model income and employment-generating project in each village.
3. Develop and enhance strategic partnerships with private sector companies in implementing workplace learning (rapid response training, industrial-based training, and apprenticeships).
4. Work with the private sector to update labor market information and scale up the number of TVET graduates with skills relevant to the labor market.

The government has implemented the following ICT initiatives to better prepare the next generation for working in the digital space:

- **One laptop per child policy.** Rwanda was the first country to implement the one laptop per child policy. The initiative involves making laptops available in all public primary schools to facilitate learning and improve the scope of materials. Statistics from the Rwanda Education Board (REB) indicate that 1,523 schools have received over 275,000 laptops.
- **Remote area internet access.** In 2019, Rwanda worked with UK-based company OneWeb to deploy a satellite to provide broadband internet to schools in remote areas. This initiative is in line with Rwanda's intention of becoming a regional technology innovation hub, opening new pathways for connectivity, providing better education, and creating new opportunities for innovators. The benefits that come with the launch of this satellite are expected to go beyond internet access. It could also enable communities to access government online services and provide access to global educational content to students and educators.

- **Knowledge Lab (K-Lab).** Rwanda's biggest technology innovation hub, K-Lab is a meeting point for innovators, students, programmers, tech engineers, and entrepreneurs. More than 60 companies have originated there.
- **ICT mainstreaming.** In 2015, the government approved the Smart Rwanda 2020 Master Plan, the country's national ICT strategy roadmap. The objective of the plan, which complements Rwanda's Vision 2020, is to develop a vibrant information and communications technology industry and position Rwanda as a regional hub.
- **Gender equality and women's empowerment.** Different strategies and initiatives have been put in place for STEM fields specifically to be equally open to women and men at all levels. These include the Education for All policy; Policy on Science, Technology, and Innovation; Rwandan Association for Women in Science and Engineering; the Forum for African Women Educationalists; and the Girls Education Policy, addressing the underrepresentation of girls in STEM subjects (Russell, 2016).



Part 3. Supply-side perspectives

This section covers two aspects of supply-side perspectives. The first covers access to secondary and TVET education. The second covers both quality and relevance.

3.1. Access to secondary education and skills training

Curriculum

Rwanda has embarked on curriculum reform, moving from a knowledge-based curriculum (KBC) based on skills acquisition, to a competency-based curriculum (CBC) based on application. The main aims of the CBC are to develop students' independent, life-long learning habits, and learn to apply appropriate skills and knowledge in real-life situations. The competencies proposed for Rwanda's educational system include critical and problem-solving skills, creativity and innovation, research, communication in official languages, cooperation, inter-personal management and life skills, and life-long learning.

This report's findings show that the teacher education curriculum has not been updated to align with the CBC, leaving teaching graduates unprepared to adequately teach the new methods. To address this, teacher training colleges and colleges of education are being fully equipped with books and laboratory materials. To further stimulate teachers' professional development, tuition fees have been reduced by 50 percent and university scholarships have been made available for teachers with at least three years of teaching experience.

The main challenge with the CBC is in the implementation, particularly regarding ICT use. Research revealed that some teachers were unable to cope with changes of ICT use, and that some teachers were afraid to use classroom technologies since devices supplied were the property of the REB. Time management in teaching and learning is also a challenge because of CBC requirements. For example the CBC requires the integration of cross-cutting issues such as environment, the 1994 genocide, gender, and peace education during a lesson delivery that lasts for 40 minutes—an extremely difficult task for teachers. For STEM subjects, practical work is encouraged—with a target of 70 percent of the time spent on practicals. However, there is not enough equipment (such as computers, laboratories, and workshops) available. In practice, the balance of theoretical and practical skills is often reversed—with 70 percent of the time spent on theory.

Teachers in some surveyed schools emphasized that the CBC was well-designed and relevant in meeting labor market needs today and in the future. However, some teachers lamented that the curriculum keeps changing without respecting due process. These challenges have meant that some teachers are still delivering content through the KBC instead of the CBC.

Technology skills gaps

Some teachers are not adequately trained in the use of technological tools. Most secondary schools do not have enough equipment to facilitate student learning, with an average of 13 students for every available computer, as of 2016. Internet connections are very slow or non-existent in some schools. The limited availability of ICT infrastructure leads to low skills among students and a mismatch between the knowledge and skills acquired and labor market needs.

Public sector workers' ICT literacy has been found insufficient. The International Computer Driving License (ICDL) agency has been engaged with the Ministry of Education to teach ICT skills to teachers and secondary school learners. The ICDL has trained employees at the Rwanda Social Security Board, Ciments Du Rwanda Limited (CIMERWA), and the Rwanda Revenue Authority, training that has helped simplify procedures make the workplace more efficient.

Different colleges have different development partners who support training in various trades such as curriculum design and ICT skills. In addition, teachers organize short training courses among themselves to share ICT skills with their colleagues, including the use of Power Point, Excel, and Microsoft Word. The African Institute for Mathematical Sciences in collaboration with the ICDL has established smart labs in 14 districts across Rwanda. These labs help ICT teachers by providing them with knowledge on how they can help students use smart classrooms.

Continuing professional development

The Rwanda Technical Teacher Training Institute trains and upgrades vocational teachers' technical skills, particularly those new to the teaching profession. Not all teachers are able to attend the institute due to limited time and resources, while others do not see the value of enrolling.

A lack of motivation among teachers, driven by inadequate salaries and large workloads, affects the quality of education. Teachers often remark on the limited time available to accomplish all the tasks that schools demand besides the day-to-day teaching, such as preparation, assessment, career guidance, and counseling. This discouragement faced by teachers working in an unfavorable environment affects teachers' pursuit of the continuing professional development. As a result, few teachers have been trained compared to the demand for training, given that they cannot afford to pay for themselves due to their low pay.

Career guidance

Career guidance services in secondary education, TVET schools, and higher education institutions are conducted at different levels. There are no hired professionals trained to give career guidance and counseling services at all educational levels. The Rwanda Education Board has a personality test kit which is used as a career guidance tool by teachers.

While some schools have nurses or teachers (who studied psychology) dedicated to providing career guidance and counseling services to students, some other schools have peer mentorships. Schools with special needs education also have career and counseling departments. Students with disabilities need special counseling to live in harmony with others and in society.

Physical and digital infrastructure

The government has committed to investing in digital infrastructure, facilitating innovators through quick business registration, and providing workspaces in government tech hubs. The Rwanda Utilities Regulatory Authority (RURA), which oversees many disrupting technologies such as payment gateways and transport initiatives, has developed a sandbox in which startups can launch their initiatives without regulatory constraints for up to a year after public launch. In 2011, the government completed a nationwide 2,300-kilometer fiber-optic cable providing fast internet access to a wider range of broadband. The latest figures from RURA show that mobile phone penetration currently stands at 74 percent, while mobile network coverage stands at around 90 percent geographical reach of the country.

While Rwanda has made impressive strides in the ICT sector, many challenges remain, and more efforts are needed—especially in digital literacy, with only 8.4 percent of Rwandans who are computer literate. Even when the physical and digital infrastructure is available, most people are reluctant to embrace ICT, particularly older people in teaching professions. Many citizens lack the skills to use smart devices to access digital services without depending on agents as intermediaries should. Therefore, the study intended to find how ICT is used in the public sector and in the formal and informal private sector.

Some government-aided schools have science laboratories, computer labs, and workshops for learners in TVET schools, but most private schools do not have sufficient equipment. In addition, institutions suffer from poor internet connections, insufficient computer maintenance capacity, and a lack of materials such as wires for electricity, steel for welding, and timber for carpentry.

Concerning the physical infrastructure, some public and private school buildings are old, classrooms leak when it rains, and classrooms are too small to accommodate all students. Almost all private schools do not have playgrounds, and the buildings themselves are very close together. At least one smart classroom with computers, internet, audio-visual tools, and other equipment is mandatory in public schools and institutions. Some schools have established learning resource centers that help the community to access ICT, but for every 10 TVET schools, two have no smart classrooms at all.

Life-long learning

Life-long learning is a cornerstone of the educational improvement agenda in the Vision 2020 plan for turning Rwanda into a competitive middle-income country. The national agenda for education aims to improve the literacy rate, reduce poverty, foster entrepreneurship, support the private sector, and train a competent workforce for its key industries. The plans promote digital technologies and open and distance learning programs to raise Rwandans' basic literacy and make educational programs more affordable, accessible, and innovative. Adult basic education is a crucial component of these educational development plans to help adults who lack basic literacy skills and competencies to fully and successfully engage with society.

Although some teachers are technically grounded in their areas of specialization, some graduates of non-teaching universities do not have adequate pedagogical skills. The Rwanda Technical Teacher Training Institute was set up in 2018 to address this gap, and 3100 teachers have been educated as “trainers of trainers” at the institution since then. Rwanda Polytechnic also has a Training of Teachers department in charge of updating teachers on the market needs and linking them to industries. Some private higher education institutions train teachers weekly on research, documentation, publication skills, and teaching methodology. The trainings are offered by professors and external consultants.

Labor forecasting

The Rwanda Development Board (RDB) has put in place several initiatives to bridge the gaps between job demand and supply. These include labor analysis forecasting, which enables the government to create jobs on different stages, and an initialization skills database, which tracks Rwandan students studying abroad with and their specialization. According to RDB statistics, graduates who complete their professional internship under RDB supervision and control do their jobs better compared to those who did not go through an internship program. Respondents indicated that the government should support people's continuous learning by improving access to such high-quality internships.

Respondents indicated that learning institutions must focus more on establishing career counseling services to enable students to select courses aligned with their strengths and labor market demands. A lack of soft skills among teachers is a significant challenge, particularly in TVET schools. To address this, further training in language and communication proficiency for teachers should be put on the agenda by the Ministry of Education.

3.2. Quality and relevance of supply-side levers

Curriculum

The 2008 establishment of the Workforce Development Authority within the Ministry of Education led to new perspectives on how to organize and plan education and training policies and curricula. This in turn heightened government focus on the linkages between education, economic health, and skills development programs geared towards enabling 4IR to flourish. Policymakers' points of view on the quality and relevance of the CBC are that the Rwandan government embarked on curriculum reform, especially in secondary education, to boost competencies in light of the growth of regional and global competition in the job market. The goal was to improve the quality of education by moving away from knowledge-based learning—which was basically about knowledge and skills *acquisition*—a comprehensive CBC aimed at knowledge *creation and application*. And while CBC helps individual learning and fosters better engagements through active participation in the classroom, there have been significant challenges, as described in the previous section and highlighted again at the end of this section.

Career guidance

In rapidly changing employment markets, career guidance has a vital role to play in supporting people through navigating transitions between education and employment. There are no professionals in the career guidance and counseling domains, so career guidance in secondary and TVET schools is performed by different teachers who might have relevant academic experience such as psychology, sociology, or nursing.

Making an informed choice is paramount in higher learning institutions such as The University of Rwanda's College of Education, which has a directorate of career guidance and employability. The university of Rwanda, College of Education has recently introduced a master's program in career guidance and hopes that career guidance and counseling professionals will be employed in various

schools and companies.

Life-long learning

Secondary education and TVET teachers hardly upgrade their skills to the next level. Teachers explain that in other areas, especially in higher learning institutions, many lecturers continue their education for personal development and fulfillment, while others see life-long learning as a step toward career advancement.

The corporate world is continuously evolving, with industries and jobs changing at a rapid rate. Employees need continuous training to keep up with the fast pace of the industry they are in—this includes teachers who have to be trained on using advanced technology infrastructures.

The University of Rwanda's College of Education has a Centre for Distance Learning and e-Learning with over 400 distance learners across all 5 provinces of the country. The center acts as a data bank for online resources for the university.

For secondary schools, life-long learning is realized during school-based training. Trainees are adequately supported by teacher training colleges on job mentoring. However, secondary school teachers cannot receive loans to finance their education. Nonetheless, experienced teachers are taking on the role of school-based mentors to become trainers and receive some appropriate incentives.

Physical and digital infrastructure

Universities admit that there is a gap in terms of their capacity to transfer knowledge—technology transfer systems are weak and there is a global lack of investment in research and development. Technology hubs, incubators and networks of mentors have not yet reached a professional and critical mass level and thus do not fully play their role as catalysts in the Rwandan start-up scene. Notwithstanding the above challenges, the use of the technological devices has changed drastically the way people work, teach and learn and how industries perform tasks.

Of all the TVET schools covered in our researched, the few 'centers of excellence' had suitable buildings and availability of chairs, desks, classrooms and ICT tools such as computers and laboratories and internet connections. ICT tools were found lacking in both private secondary education and TVET schools, exacerbated by insufficient maintenance and limited internet connectivity.

Assistive technologies for learners living with disabilities are inadequate. The available technologies in some of the schools are braille, mobility aids such as wheel chairs, walkers, crutches, and hearing aids—but due to insufficient funding, students lacked more advanced materials such as computer programs and tablet applications that provide text-to-speech and speech-to-text, electronic worksheets, phonetic spelling software, and talking calculators.

3.3. Policies aimed at improving quality and relevance

The 2008 establishment of a dedicated workforce development authority within the Ministry of Education led to a new perspective in terms of organization of the post-school education and training landscape.

The Education Sector Strategic Plan (ESSP 2015) aims to improve education—particularly skills development geared to meet labor market demand – by increasing the coverage and quality of nine-year basic education and strengthening post-basic education. Pre-service training provides trainers with an initial education in relevant subject areas and teaching methodology, as the foundation for professional practice and development. It is currently taking place in the three sets of institutions. These include teacher training colleges being trained to attain a Certificate (A2), primary school teaching colleges of education training to a Diploma (A1), lower secondary teaching and UR-CE which trains (A0) degree level for upper secondary teaching. The teacher training and development department of REB liaises with all of these institutions to ensure quality training.

In addition, in-service teacher training (INSET) offers teachers opportunities for continuous development, especially in providing English language training for all primary and secondary school teachers, and management training for head teachers. The teacher training and development department works closely with district education officers to facilitate decentralized ownership and delivery of INSET. Achievements include English language training for around 45,000 mathematics teachers; training of 250 teachers of the first cohort for school mentors, foundation of English language training for 41,000 teachers, and mobilization of external support for the Rwanda Education Assistance Project. This project is expected to address major skills gaps in the workforce with school leavers and to create graduates that are equipped with English language and communication skills.

The quality and utility value of education depends on the quality and competence of the teaching staff. Thus, the status of teachers has become a focus of the government as espoused in the education sector strategic plan. As part of the initiative to uplift teachers' standards, the Savings and Credit Cooperatives (SACCO) for teachers were established in all districts, allowing teachers to get loans at low interest rates.

3.4. Challenges in improving relevance and quality of education

The Ministry of Education has trouble sourcing a sufficient number of trained teachers who are motivated and committed to stay in the profession. The main challenge is the high turnover of competent and experienced teachers due to low salaries. Teachers in secondary education and in TVET schools face heavy workloads arising from the demands of CBC, which requires teachers to carry out many activities. These include teaching and engaging students in discussion groups, supervising students to use digital tools, and integrating cross-cutting issues such as gender, environment, peace education, and career guidance to students within 40 minutes. The teacher-student ratio is very high at between 45-55 students per class, especially in public secondary and TVET schools.

Due to an unstable language policy, numerous professors in higher learning institutions and teachers who have a French background cannot satisfactorily teach in English language as medium of instruction. English enrichment courses are offered to teachers, but they have not been able to close the skills gap. In addition, the extent to which teachers' knowledge and skills are aligned to needs in the labor market and evolving digital technologies is also questionable because the fourth industrial revolution has changed the way people work, how industries perform tasks and how economies are moving.



Part 4. Demand-side opportunities and constraints

This section highlights how demand-side actors participate in the design and development of education and skills training systems. It also assesses the interaction between the supply- and demand-sides and identifies challenges and opportunities.

4.1. Curriculum development

Many young graduates in Rwanda find it difficult to land jobs, as their skillset does not meet the current labor market needs. Graduates often lack both technical skills and soft skills such as critical thinking, creativity, public speaking, analytical skills, writing skills, ICT literacy, and data analytics. Gaps in the curriculum cause part of this mismatch. To ensure the curriculum is more closely aligned with labor market needs, large formal sector firms, including manufacturers and service providers, are engaged in curriculum development and design. The Ministry of Education's National Qualification Framework is also designed to absorb signals from employers about their required standards in terms of knowledge acquisition.

However, while policymakers emphasize that the private sector is closely involved in curriculum development, those in the private sector allege that they do not participate fully in the process. During interviews, some respondents indicated that engagements from the ministry were limited to a one-day workshop, which was not considered sufficient to cover all the critical issues.

Another challenge is that small enterprises and representatives from the informal sector are not adequately engaged during curriculum design. Such stakeholders face difficulties in collective engagement in organizing and financing interventions, leading to limited informal sector employer participation in training curriculum design. Those representing the informal sector also tend to have low levels of education and cannot significantly contribute to curriculum design and development.

4.2. Internship programs

Internships and industrial attachments are two of the most important ways for the private sector to engage with educational institutions and learners. Some higher learning institutions and technical schools have partnerships with private sector partners for internships that could last between two to four months.

The RDB coordinates and implements professional internships in the public and private sector for young graduates. It sets up a budget for implementing professional internship programs, which run from six months to two years, depending on the industry. Each young graduate is eligible to apply for a professional internship at the RDB platform. The RDB not only offers professional internships, but

also gives a monthly stipend of RF50,000 per intern, which the host institutions may top up. Through the National Employment Policy, the Ministry of Public Service and Labor also facilitates learning institutions to provide highly skilled graduates that can participate in professional internships.

Some industry organizations have devised programs to reduce the mismatch between the labor force and labor market needs. One such organization, the Rwanda Youth in Agribusiness Forum (RYAF), aims to develop the agriculture sector by attracting and training young graduates and challenging and changing the youth's mindset. RYAF mobilizes youth to engage in agribusiness, and it has partnered with the Ministry of Education through the University of Rwanda and Rwanda Polytechnic to provide internships to graduates. Through these programs, the RYAF empowers the internee with soft skills and ICT skills to enable youth to gain and share knowledge about farming practices. RYAF also offers short-term job opportunities in climate technology and financially supports young entrepreneurs looking to start a small agro-business.

A major challenge for internship programs is the high unmet expectation of formal sector companies, who expect fresh graduates from higher learning institutions to have very good matching skills but often find them lacking. As they often do not value attracting interns, some companies demand internship fees between RF10,000 and RF60,000. Many private and some public institutions also mislead prospective interns about the nature of their internship, for instance, by attracting an intern for a position working with ICT and using them as an office messenger. In addition, interns expressed that some employers refuse to share their knowledge out of fear that the interns would replace them.

4.3. Continuous learning

Several private sector institutions train professionals and entrepreneurs. One of those is the business consulting firm Inkomoko, specialized in small and medium enterprises and micro-businesses. It supports young entrepreneurs in agri-business, hospitality, and tourism through training and capacity building. The training courses offered include access to finance, project proposal writing, and development and leadership. Public sector institutions also partner with the private sector to provide professional training. The Rwanda Utilities Regulatory Agency, which regulates fares in the transport sector, and the Rwanda National Police, which issues driving licenses and jointly trains all professional drivers.

In many cases, private sector involvement and engagement of employers in training is a significant challenge. Even though private sector companies have some training initiatives, they fail to attract many TVET schools and higher learning institutions due to low demand from trainees. Because most of training that youth receive is achieved through apprenticeships in the informal sector without certified qualifications, rather than through formal training institutions, it is difficult to demonstrate their qualifications in the formal sector certification.

4.4. Gender equality

There is an uneven distribution of employment opportunities between women and men in the formal and informal sectors. According to survey respondents, the imbalance is influenced by the nature of work and working environments, and the prevailing mindset that some jobs are meant for women and other for men. For example, at the time the research was conducted, Remera-Giporoso Transport cooperative had 216 drivers compared to only 22 female workers, all of whom were in charge of booking and ticketing passengers.

While there are good gender mainstreaming policies demanding equal access to employment opportunities, as well as state initiatives to have more women in politics and key government positions, there are still few women in the labor force compared to men in key positions across numerous high-value professions, including teaching, mining, and construction.



Part 5. Conclusions and policy recommendations

Based on the overarching issues that emerged from the study, several key policy recommendations can be made in response. They include upgrading skills of teachers and trainers, improving ICT infrastructure and ICT tools for schools, ensuring consistent and quality instruction, improving the quality and relevance of TVET, increasing education funding, and prioritizing key areas. These policy recommendations are described in more detail below.

- **Upgrade CBC skills of teachers, trainers, and lecturers.** Findings from this study show that there is still a big challenge for teachers in the implementation of the competency-based curriculum (CBC). Teaching the CBC requires a very different pedagogy and approach in the classroom compared to the knowledge-based curriculum (KBC), including greater knowledge of ICT tools. Teachers, trainers, and lecturers need more support than just a short training course to develop these skills. Therefore, the immediate priority for the Ministry of Education is to improve the pedagogical competencies of the existing teachers, trainers, and lecturer and to ensure they have the knowledge and skills to implement the CBC.
- **Improve access to ICT and the quality of digital infrastructure.** Strong digital infrastructure is a cross-cutting enabler that offers numerous opportunities across the labor market. Recognizing this, the government has prioritized STEM and ICT as areas for investment to improve the quality and relevance of education. However, there is still a shortage of adequately qualified teachers and lecturers, and most schools, TVET institutions, and higher learning institutions lack the right laboratory equipment and materials. The Ministry of Education should focus more on developing digital content aligned to the curriculum and boost increased ICT penetration and usage in education through smart classrooms, not only in schools of excellences but also in every other institution.
- **Enhance teachers' English skills for improved instruction.** Insufficient English language competencies among teachers in secondary schools, TVET schools, and higher learning institutions threaten to jeopardize curriculum delivery and negatively impact learning outcomes. Therefore, the Ministry of Education should make a review of the existing policies on language management systems and invest in further language training for teachers to ensure consistency within the existing language of instruction policies.
- **Strengthen the links between industry and the education system.** This study identified weak links between industry and educational institutions for the provision of internships. The government should implement initiatives through the national employment program to directly link the quality and relevancy of programs with the labor market. The private sector needs to have a more significant role in providing training and development for

new employees. This could be done through the expansion of the Rwanda Development Bank's skills sector councils, which bring together the private sector and other stakeholders, including chambers of commerce, higher education and TVET institutions, and the Workforce Development Agency (WDA).

- **Improve the quality and relevance of TVET.** Employers are generally unsatisfied with the skill level of TVET graduates. As a result, securing employment for those graduates remains a challenge. The private sector needs to be involved from the initial stages of curriculum design and development to the last stage of training to ensure relevance to the labor market. Employers should participate in innovative training systems, career guidance, and counseling services to orient trainees towards potential opportunities in the rapidly changing labor market.

Workplace exposure initiatives should receive more funding to enhance their cooperation and coordination. Relevant stakeholders that need to be strengthened include the WDA, which is in charge of quality assurance; the Rwanda polytechnics, who oversee the implementation of the programs; the Capacity Development and Employment Services Board; and the private sector.

Expanding TVET enrollment and making it a more attractive and viable alternative educational pathway is critical; it is also complicated by the negative perception of TVET schooling held by many parents. The Ministry of Education and development partners should create awareness campaigns at the sector, district, and national levels to sensitize civil society organizations, parents, guardians, students, and employers about the opportunities for TVET institutions.

- **Expand recognition of skills acquired in the informal sector.** Many people in the private sector are trained in various vocational centers for three to six months, but even those who have graduated from these institutions often have no exit award. Employees in the informal sector—such as those trained and employed in carpentry, construction, culinary service, mechanics, hairdressing, and welding—are often equipped with all the necessary competencies to compete favorably with graduates from technical institutes. However, these practical skills acquired in the labor market are also not officially recognized. The WDA should assess graduates and workers in the informal sector and confer them with a certificate of recognition.
- **Increase the budget allocation to the education sector.** Schools, colleges, and training institutions remain significantly underfunded. This has particularly affected the quality of science education and access to the secondary school system. School managers often reported that they could not afford laboratory experiments for science subjects, reducing time spent on the practical application of acquired knowledge. Budget constraints have also resulted in insufficient syllabuses and textbooks supplied to secondary schools. The government should increase funding for education, and the Ministry of Education and REB should increase the budget for laboratory equipment and distribute more textbooks.

Increased funding would also allow for the development of focus areas, including capacity and professional development and management training for teachers across all levels of education. This would enable school teachers, TVET instructors, and higher education lecturers to deliver the curriculum with the appropriate skills and competencies. Increased capacity would also ensure greater recruitment and retention of quality teachers.

REFERENCES

- Darling-Hammond, L. (2012). Policy frameworks for new assessments. In *Assessment and teaching of 21st century skills*. https://doi.org/10.1007/978-94-007-2324-5_6
- Malunda, D. (2020). Accelerating structural transformation towards SDG goals: Macroeconomic and sectoral policies for full and productive employment in Rwanda. GENEVA: INTERNATIONAL LABOUR OFFICE.
- Ministry of Education. (2013). Education Sector Strategic Plan 2013/14-2017/18. Kigali, Rwanda: Ministry of Education.
- National Institute of Statistics of Rwanda. (2017). Labor Market and Economic Activity Trends in Rwanda. Kigali, Rwanda.
- National Institute of Statistics of Rwanda. (2018). Labour Force Survey August 2017 report. Kigali, Rwanda.
- National Institute of Statistics of Rwanda. (2022). Labour Force Survey Annual Report 2021. Kigali, Rwanda.
- REB. (2015). Competence-based curriculum: Curriculum framework: Pre-primary to upper secondary 2015. Kigali: Rwanda Education Board.
- Russell, S. G. (2016). Global gender discourses in education: evidence from post-genocide Rwanda. *Comparative Education*, 52(4), 492-515.
- Rwanda Education Statistics Yearbook, 2018.
- Scardamalia, M., Bransford, J., Kozma, B., & Quellmalz, E. (2012). New assessments and environments for knowledge building. In *Assessment and teaching of 21st century skills*. https://doi.org/10.1007/978-94-007-2324-5_5

Youth Employment and Skills (YES) Multi-Country Study

Strengthening Education and Learning Systems to Deliver a 4IR-Ready Workforce

Rwanda
Country Report



 www.acetforafrica.org

 [@fb.com/acetforafrica](https://fb.com/acetforafrica)

 [@acetforafrica](https://twitter.com/acetforafrica)