BUILDING BETTER FORMAL TVET SYSTEMS

PRINCIPLES AND PRACTICE IN LOW- AND MIDDLE-INCOME COUNTRIES

THE WORLD BANK
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Foreword

This is the right moment to reform Technical and Vocational Education and Training (TVET) in low- and middle-income countries. In a context of rapidly changing labor markets and evolving skills needs due to globalization, technological progress, demographic transformation, and climate change, the need for well-performing TVET is critical for ensuring smooth job transitions. Also, at times of high youth unemployment worldwide and record enrollment in basic education, TVET can provide an opportunity for many to transition quickly to the labor market, to perform critical jobs with higher productivity, and to support the transition to sustainable and resilient societies. However, despite its high potential, TVET often falls short of expectations in low- and middle-income countries. This is largely due to challenged TVET learners, unsupported TVET teachers, and weak incentives for TVET providers and the resulting inadequate links between TVET and labor markets.

The Transforming Education Summit, called by the United Nations Secretary General in 2022, recognized the importance of a transformed investment in skills in all countries but especially low- and middle-income countries. TVET that is accessible, equitable, of high quality and relevance can further provide lifelong learning opportunities, address skills needs of enterprises, including the needs of the self-employed, and support countries' sustainable development and resilience. Following the COVID-19 pandemic and multiple crises of recent years, it is time to review the current state of TVET systems and learn from recent reform experiences in low- and middle-income countries for the recovery and beyond.

The World Bank, ILO, and UNESCO have a long history of supporting TVET reforms around the world. Thus, they formed a partnership to combine their knowledge and experience in developing new guidance for reforming TVET systems. The initial focus of this partnership has been on formal TVET, defined as TVET obtained within the formal education system that leads to diplomas, degrees, or other formal certifications. The outcome of this joint effort is this report "Building Better Formal TVET Systems: Principles and Practice in Low- and Middle-Income Countries" that provides guidance to policymakers and practitioners on designing and implementing TVET reforms with a focus on core principles and practical considerations for low- and middle-income countries.

The report brings together the global knowledge on TVET reform to develop a joint understanding of the main challenges and the lessons learned from TVET reforms, including the experience gained during the COVID-19 pandemic. Based on this understanding, the report offers a joint way forward towards better TVET and can be the basis for more impactful and coordinated support of TVET systems in the future. With TVET playing a central role in preparing learners for the changing world of work, the report's call for transforming TVET is very timely.

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The findings, interpretations, and conclusions are those of the authors and do not necessarily reflect the views of management, the reviewers, or other colleagues consulted or engaged in the preparation of the report.

Abbreviations

ACQF	African Continental Qualifications Framework
ActiVaR	Activating the Future of Technical and Technological Training in Ecuador
ADB	Asian Development Bank
ALMP	Active Labor Market Program
AR	Augmented Reality
ASEAN	Association of Southeast Asian Nations
B2B	Business-to-Business
B2G	Business-to-Government
BRICS	Brazil, Russia, India, China, and South Africa
CBET	Competency-Based Education and Training
CCM	Mining Skills Council
CEART	Committee of Experts on the Application of the Recommendations concerning Teaching Personnel
CEDEFOP	European Center for Development of Vocational Training
CENEP	Center for Population Studies
CLASS	Classroom Assessment Scoring System
CMSC	Chilean Mining Skills Council
CVET	Continuing Vocational Education and Training
DET	Department of Education and Training of Australia
EAP	East Asia & Pacific
EASTRIP	Transformation and Regional Integration Project
ECA	Europe & Central Asia
EdTech	Education Technology
EMIS	Education Management Information Systems
ETF	European Training Foundation
EU	European Union
EVENT	Enhanced Vocational Education and Training
GDP	Gross Domestic Product
GIZ	German Agency for International Cooperation
GNI	Gross National Income
GSA	Global Skills Academy
HIC	High-Income Country
HRDC	Human Resource Development Committee
IADB	Inter-American Development Bank
IAG TVET	Interagency Group on Technical and Vocational Education and Training
IBM	International Business Machines Corporation
ICT	Information and Communication Technologies
IFC	International Finance Corporation
ILO	International Labour Organization
ISCED	International Standard Classification of Education
ITU	International Telecommunication Union

IVET	Initial Vocational Education and Training
KRIVET	Korea Research Institute for Vocational Education and Training
L/MIC	Low- or Middle-Income Country
LAC	Latin America & Caribbean
LIC	Low-Income Country
LMIC	Lower-Middle-Income Country
LMIS	Labor Market Information System
MCC	Millennium Challenge Corporation
MIC	Middle-Income Country
MIS	Management Information System
MNA	Middle East & North Africa
MoE	Ministry of Employment
MOOC	Massive Online Open Courses
NEET	Not in Education, Employment, or Training
NGO	Non-Governmental Organization
NORRAG	Network for International Policies and Cooperation for Education and Training
NQF	National Qualification Framework
NSDC	National Skills Development Corporation
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OECD DAC	OECD Development Assistance Committee
OER	Open Educational Resources
OLS	Ordinary Least Squares
PFP	Teacher Pay-For-Performance
PISA	Programme for International Student Assessment
PPP	Purchasing Power Parity
PSDF	Punjab Skills Development Fund
RBF	Results-Based Financing
RPL	Recognition of Prior Learning
SABER-WfD	Systems Approach for Better Education Results - Workforce Development
SAR	South Asia
SDG	Sustainable Development Goal
SENAI	Brazilian National Service for Industrial Training
SENATI	National Training Service of Industrial Work
SIP	Strategic Investment Plan
SME	Small and Medium-sized Enterprise
SSA	Sub-Saharan Africa
SSC	Sector Skills Council
STEM	Science, Technology, Engineering, and Mathematics
STEP	Skills and Training Enhancement Project

TAP	Training Assessment Project
TESDA	Technical Education and Skills Development Authority
TVET	Technical and Vocational Education and Training
TVSDC	Technical and Vocational Skills Development Commission
UMIC	Upper-Middle-Income Country
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UNESCO	United Nations Educational Scientific and Cultural Organization
UNESCO-UIS	UNESCO Institute of Statistics
UNESCO-UNEVOC	UNESCO-International Center for Technical and Vocational Education and Training
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
VR	Virtual Reality
VTE	Vocational and Technical Education
VTPC	Vocational Training and Production Center
WAVA	West Africa Vehicle Academy
WB	World Bank
WBG	World Bank Group
WBL	Work-Based Learning
WEF	World Economic Forum
WTO	World Trade Organization
YES	Youth Employment Service

Executive Summary

A broken link between technical and vocational education and training (TVET) systems and labor markets prevents TVET from delivering on its promise in low- and middle-income countries. With its unique focus on workforce development, TVET has the potential to contribute to employment and productivity to better support sustainable economic transformation. The experiences of countries like Austria and Germany whose TVET systems are well-established, and of younger but also strong systems like those of the Republic of Korea or to some extent Malaysia demonstrate what is possible for TVET in low- and middle-income countries (LICs and MICs, together: L/MICs). When TVET functions well, its graduates have the right skills for today's jobs but are also prepared to adapt in the future as skills need change. Strong TVET systems can help countries meet the Sustainable Development Goals by sustainably and efficiently supporting employment and productivity. This promise of TVET is unfulfilled in many L/MICs because secondary and post-secondary TVET institutions focus on what they know how to provide, but not what students or firms need.

Three main symptoms of this broken link are evident in a wide variety of contexts: challenged TVET learners, unsupported TVET teachers, and weak incentives for TVET providers.

Of prime concern are the problems of the TVET learners. Their families are challenged financially: they generally have lower incomes than those of their peers in general education. They are also deprived of the benefits of information about the labor market and about their TVET options. Female learners often suffer further from rigid social norms that prevent them from entering profitable specializations, or from enrolling in TVET at all. Moreover, the foundational skills of TVET learners are weak not only at entry, since many education systems guide or track lower-performing students into these programs, but probably also at graduation, because most TVET programs do not give enough attention to fostering these skills.

TVET teachers often lack the pedagogical skills they need to deliver quality training, and they often have little if any industry experience, which is particularly damaging to their ability to acquire and then teach practical skills. Teacher morale, and therefore their motivation, also often suffer from poor working conditions and lack of prestige, even compared to teachers in general education.

The third symptom of the broken link is that are few incentives for TVET providers to be accountable to either learners or enterprises. The very little data that is collected looks mainly at inputs, occasionally at outputs, but almost never at results. Most TVET systems are not simply good or simply bad; the problem is that TVET

is a risky investment that pays off only for some individuals. Among those who may benefit are students with strong foundational skills who are unlikely to complete a university degree; women with mentors in male-dominated trades; graduates whose fields of study are in demand or who attend a highly respected TVET institution; or those seeking a quicker school-to-work transition—though possibly at the cost of their skills depreciating faster over time. However, this valuable information is usually hidden from the stakeholders who are making decisions.

TVET reforms in L/MICs are urgently needed. In the next two decades, demographic trends, coupled with higher completion rates at lower levels of education, are likely to cause an exponential increase in the number of TVET students, particularly in LICs. In Burundi, Liberia, Mali, Mozambique, Senegal, Tanzania, or Uganda, for instance, the number of secondary TVET students is expected to more than quadruple; in Sudan and Niger, the number is expected to rise, respectively, by a factor of six and ten. Demand for TVET from learners whose education was disrupted by COVID-19 may also rise; and that cohort of likely prospective TVET students may require tailored support. However, it may be risky to expand a system that is too often considered a second-tier educational track that takes in disadvantaged learners with weaker foundational skills and that often does not meet labor market needs. The challenge is compounded by the megatrends associated with globalization, technological progress, demographic transformation, and climate change, which affect not only skills demand but also the distribution of economic opportunities.

The current moment is ideal for reform, and it offers numerous opportunities to leapfrog barriers to progress. There is a great deal that can be learned from domestic and global practices and evidence, especially from countries like Bangladesh, Brazil, El Salvador, Mongolia, and Mozambique, whose labor market, institutional, fiscal, and capacity constraints are typical of L/MICs. This evidence base is growing, buttressed by tools to improve diagnosis and learning at the system and institutional levels. Technology—if accompanied by complementary investments—has the potential to transform TVET in L/MICs, from course design and development, program delivery, work-based learning (WBL), student services, and recognition of prior learning to governance, labor market information systems, accreditation, and quality assurance. The COVID-19 pandemic accelerated the development of digital TVET learning models, bringing with it opportunities but also highlighting the many constraints that need to be overcome for these innovations to reach their full potential and contribute to the system's resilience to future disruptions.

While reform priorities will differ depending on the context, three interrelated transformations point to the types of reforms needed to achieve better TVET. Transforming the system towards excellence, end results, and evidence is underpinned by six policy priorities that address critical common bottlenecks in L/MICs. These priorities help explain at least some of the heterogeneity in performance found in TVET systems across and within countries and in its current contribution to employment and productivity. Policy priorities are often complementary and, in many ways, priorities under the second and third transformations also support the first transformation towards excellence.

THE FIRST TRANSFORMATION: From Striving for Recognition to Striving for Excellence.

This transformation deals with how to move TVET from being (or being perceived as) a second-tier education track with limited opportunities for continued learning and highly variable returns to guaranteeing demand-driven and equitable acquisition of relevant skills with hands-on and flexible instruction delivered by high-quality teachers with excellent educational resources and infrastructure. The three policy priorities underpinning this transformation focus on who the main clients of TVET are, what skills are taught, and how they are delivered.

PRIORITY 1.

The Who: Focus on both enterprises[1] and learners as the main clients and become more responsive to their needs. To achieve this, TVET must become more demand-driven and more strategic to serve the needs of enterprises, and more student-centered and more equitable to serve the needs of learners.

PRIORITY 2.

The What: Foster a portfolio of skills by prioritizing foundational skills[2] both at entry into TVET and within TVET programs, and by imparting the technical skills demanded by the relevant labor market. Given the weaknesses identified in the foundational skills of TVET learners, these skills need to be prioritized for remediation and continued growth. The focus on technical skills should match labor market needs, which in many contexts include digital, green, and entrepreneurship skills.

1 This term is used to refer to formal or informal firms of any size in the private sector as well as those in the non-governmental and public sectors.

2 These skills are also sometimes referred to as transversal or core skills (ILO 2021, Global Framework on Core Skills for Life and Work in the 21st Century. Geneva).

PRIORITY 3.

The How: Promote an integrated ecosystem with flexible pathways between TVET and general education, hands-on approaches including work-based learning, and quality inputs, including teachers, resources, and infrastructure. Striving for excellence in TVET delivery is about three things: (1) flexible pathways, where TVET can become a stepping stone for further studies with a clear articulation of the different options for technical secondary and post-secondary education, and smooth integration with formal, non-formal, and informal short-term training and universities as part of a lifelong training process, (2) WBL, which is critical for acquisition of practical skills; and (3) quality inputs, particularly teachers but also curricula, infrastructure, and equipment.

THE SECOND TRANSFORMATION:
From a Focus on Inputs to a Focus on End Results.

This pertains to reforms that increase the autonomy of TVET providers and ensure greater accountability for results as well as using financing to promote needed reforms and target priority needs.

PRIORITY 4.

Get the balance right between autonomy and accountability of TVET providers. This can be achieved by strengthening quality assurance, though in a simplified and gradual manner to account for local capacity constraints and to involve stakeholders in the process. Direct accountability to learners and enterprises can be strengthened by using information to help learners and enterprises select the most suitable TVET specializations or providers.

PRIORITY 5.

Realign the financing of TVET to reward reforms and results while increasing financing in under-funded areas. TVET provision is more expensive to deliver than general education, partly due to the higher capital and operating expenses of equipment as well as costs associated with work-based learning, but also often due to resource misallocation. Today, TVET financing is almost universally based on inputs with little to no connection to actual outcomes for learners or to reform efforts. Yet, financing can be a powerful tool to improve outcomes, reduce inefficiencies, and create a space for innovation in service delivery. Realigning financing with labor market and education results, and

conducting periodic reviews to obtain feedback and facilitate learning are thus critical reforms. In turn, this should help crowd-in private investment and increase spending in areas that are central but underfunded, such as teacher training or work-based learning.

THE THIRD TRANSFORMATION: From Decisions Based on Conjecture to Decisions Based on Evidence.

TVET systems in L/MICs are largely operating in the dark, with data scarce and the evidence base limited, particularly in comparison with other parts of the education system. Building a robust information and evaluation system adapted to the L/MIC context is essential for empowering stakeholders to make informed decisions and improving TVET practices.

PRIORITY 6.

Reduce the information gaps of learners, enterprises, TVET providers, communities, and policymakers by collecting and publicizing detailed data on TVET returns, skills need, and TVET provider inputs and practices. More regular data collection and better analysis and use of information can bring more light to TVET and help different stakeholders to make more informed decisions.

There are many quick wins that can demonstrate the benefits of TVET reform and help ignite more fundamental changes. While the three transformations may require significant investment and time, countries can start reforms with a strategic approach to priority sectors and programs that would deliver quicker results and can be used as demonstration cases to build stakeholder confidence and trust. Another example is giving priority to market-driven mechanisms of short-route accountability, which can improve quality and relevance relatively quickly while capacity is being built for enhanced formal quality assurance mechanisms. This report highlights such quick wins and draws lessons from other reform efforts to honor TVET's promise of contributing to better employment and productivity in support of sustainable economic transformation in L/MICs

Overview

Reform of formal technical and vocational education and training (TVET) is urgently needed in most low- and middle-income countries. Demographic trends, coupled with higher rates of students completing lower levels of education, can lead to an exponential increase in the number of secondary TVET students in the next 20 years, particularly in low-income countries (LICs). However, there are significant risks attached to expanding a system that is often considered a second-tier educational track and to which challenged learners are often directed. Because of a broken link between TVET systems and labor markets in low- and middle-income countries (LICs and MICs, together: L/MICs), TVET cannot deliver on its promise. The urgency is compounded by megatrends associated with globalization, technological progress, demographic transformation, and climate change, which affect both skills demand and the distribution of economic opportunities.

Getting TVET right is possible but also challenging. L/MIC governments are trying to respond to the calls for reforms in their TVET systems, but it is often difficult to improve TVET access, equity, quality, and relevance sustainably and at scale. Bangladesh, Mongolia, and El Salvador—like many other countries—illustrate the TVET reform successes and challenges.

- **Bangladesh has implemented significant and successful reforms in numerous areas, but some aspects, like incentive payments to providers, have required extra effort.** Between 2007 and 2019, several projects such as the Bangladesh Skills for Employability Project and the Bangladesh Skills and Training Enhancement Project (STEP) supported TVET reforms. The STEP supported selected public and private TVET institutions by increasing financing conditioned on reform efforts, institutional support, hiring and training teachers, strengthening links with the private sector, and funding to improve the quality and employability of trainees, including disadvantaged and female students. The reforms improved examination pass rates, student academic performance and retention, completion of shorter courses, and employment rates of short-course graduates. However, not all reforms went smoothly: a competitive Annual Performance Grant scheme was almost canceled during the project due to the TVET institutions' limited capacity to absorb funds but was later reinforced and was successful (World Bank 2019a).

- **In El Salvador, a comprehensive TVET reform had positive effects on enrollment and learning, but that did not improve labor market outcomes.** Between 2007 and 2012, the Millennium Challenge Corporation (MCC) supported a large range of reforms in El Salvador to improve the quality and relevance of selected TVET centers; reforms addressed financing constraints through scholarships, changed teacher recruitment and training procedures, invested in equipment and infrastructure, and introduced new programs. The

reforms did increase enrollment in secondary and post-secondary TVET and improved learning outcomes, but they had no effect on student job placement or income in comparison with students in similar TVET centers. An evaluation of the reforms argued that a notable missing link was the lack of accountability, especially between employers and providers (Campuzano et al. 2016).

- **A comprehensive TVET reform in Mongolia improved labor market outcomes significantly, but over time several reform elements were rolled back.** Between 2008 and 2013 the government of Mongolia undertook a comprehensive reform package to improve TVET quality and relevance. The reforms focused on selected TVET institutions, establishing skills standards and competency-based curricula, retraining of teachers, introducing labor market information systems, enhancing career counseling, and upgrading training equipment and physical infrastructure. A randomized impact evaluation found that the reforms had positive impacts on employment and increased the earnings of women. However, after a political transition in 2012, several important reform elements were partly reversed. For example, a high-level TVET decision-making body that included private sector representatives was effectively dissolved (Field et al. 2019).

This report offers guidance to policymakers designing and implementing TVET reforms, emphasizing core principles and practical considerations for L/MICs. There is much to be learned from recent L/MIC reform experiences like those in Bangladesh, El Salvador, and Mongolia, about identifying effective reform strategies and the likely impact of megatrends on future demand for TVET. The report focuses on secondary and post-secondary non-tertiary formal TVET, defined as TVET obtained within the formal education system that leads to diplomas, degrees, or other formal certifications.[1]

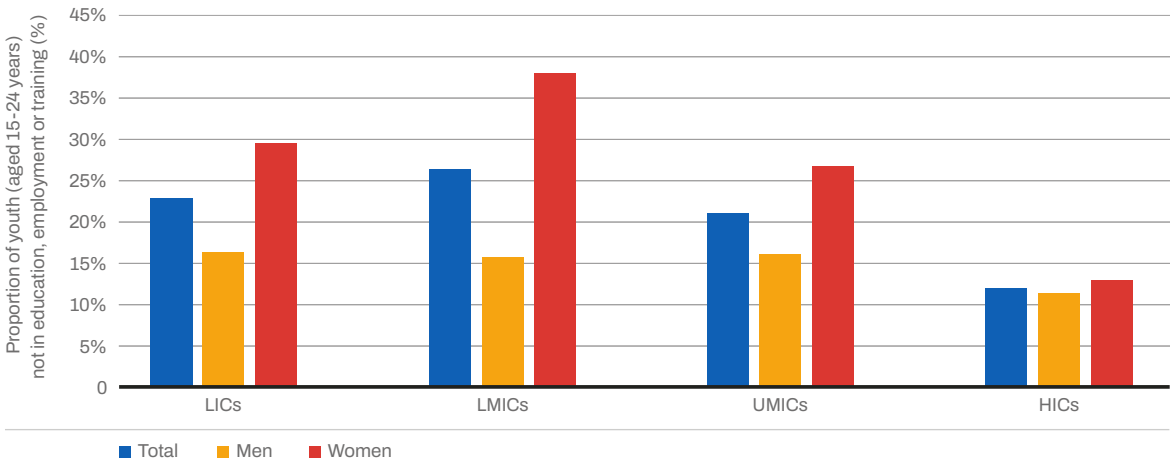
This overview, summarizing the main messages from the report, has three parts. The first, "The TVET Promise," looks at the potential of TVET systems to deliver access to equitable, quality, and relevant training and contribute to employment and productivity. The second, "The TVET Challenge," articulates the main limitations in practice for L/MIC TVET systems. The third, "The Way Forward to Better TVET," proposes three interrelated transformations (three E's) and six policy priorities to help TVET deliver on its promise in L/MICs.

1 Although similar in the emphasis on practical training, post-secondary non-tertiary formal TVET is different from short-cycle tertiary programs, which are usually longer (at least two years) and have a broader focus (Ferreyra et al. 2021).

PART 1
The TVET promise
Contributing to Employment and Productivity for Sustainable Development

Increasing economic opportunities and productivity while supporting sustainable economic transformation is among the most pressing L/MIC challenges. Too many people are out of work and those who are in work are often in informal, low-productivity jobs with poor working conditions and no social protection. As a result, particularly in LICs, employment often coexists with poverty: almost 40 percent of the employed live below the extreme poverty line of $ 1.90 PPP.[2] Women and youth are often particularly disadvantaged (World Bank 2012; Merotto et al. 2018). Indeed, over 20 percent of youth in L/MICs are not in education, employment, or training; among young women in lower-middle-income countries (LMICs), this rate rises to almost 40 percent (see Figure O.1). High informality, large shares of workers in self-employment and wage employment in small and micro firms, and large wage disparities, are common in many L/MIC labor markets (Merotto et al. 2018).

Figure O.1: Many Youth Are Not in Education, Employment, or Training



Source: ILOSTAT data.

Note: LICs = Low-income countries, LMICs = Lower-middle-income countries, UMICs = Upper-middle-income countries, HICs = High-income countries. The data is for year 2020.

Education and training systems, including TVET, can help equip current and future workforce with the skills they need for productive jobs and entrepreneurship, but in practice most countries struggle to deliver on the promise of skills development. Employer surveys conducted as part of School-to-Work Transition Surveys in Benin, Liberia, Malawi, and Zambia, for example, show that more than 60 percent of firms consider technical skills to be very or extremely important—the highest among seven possible sets of skills (Arias et al. 2019). Better skills, including foundational (or core, transversal) cognitive and socioemotional skills as well as digital and occupation—or job-specific — technical skills can facilitate the shifting of work and economic activity from less to more productive uses within and across sectors, and thus contribute to structural

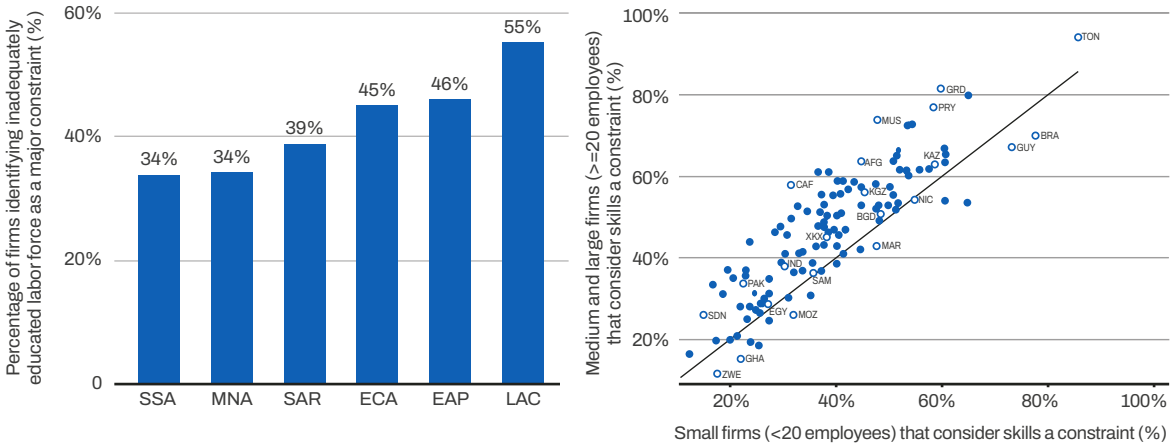
2 ILOSTAT data for 2019. As price differences evolve, the global poverty line is periodically updated in response. In September 2022 the international poverty line was updated from $1.90 to $2.15 per person per day.

transformation and economic growth (Herrendorf and Schoellman 2018; Flabbi and Gatti 2018; Gaspar Martins 2019; Karachiwalla and Palloni 2019; Woldemichael and Shimeles 2019). Technical skills, the focus of TVET programs, have been associated with a higher worker, firm, and aggregate productivity (Criscuolo et al. 2021, Cima et al. 2022, Asian Development Bank 2015, and CEDEFOP 2011). Skills, including those provided through TVET, can also support making growth more equitable (World Bank 2018c). Yet on average a third to more than half of formal employers report that a lack of skilled workers is a significant bottleneck for their operations, particularly as firms become larger and, usually, more productive (Figure 2). Employer surveys in countries as diverse as Bangladesh (World Bank 2015), Kenya (World Bank 2017a), and Sudan (Sorkatii et al. 2016) especially cite skills gaps among TVET graduates.

Figure O.2: Skills Can Be a Constraint to Employment and Productivity in L/MICs

A) Numerous employers in L/MICs identify an inadequately educated workforce as a major constraint.

B) Medium and large firms are more likely than smaller firms to consider an inadequately educated workforce as a major constraint.



Source: Data from World Bank Enterprise Surveys.

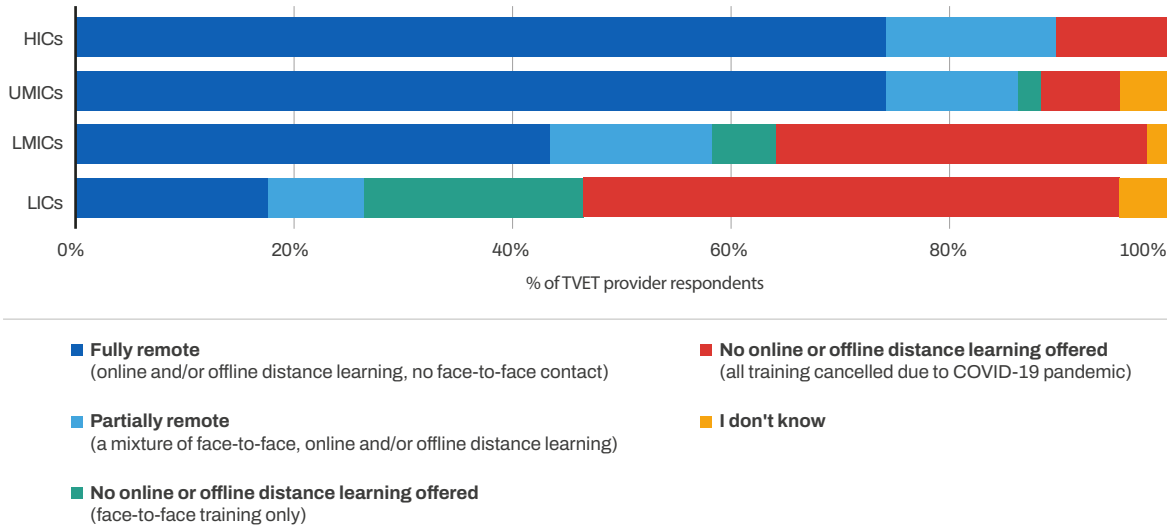
Note: Data restricted to LICs, LMICs, and UMICs. Dots in B represent countries. The indicator measures the share of firms that rate skills (1 = not important to 5 = important) above the average rating that the same firm gives to all the constraints surveyed. EAP = East Asia & Pacific, ECA = Europe and Central Asia; LAC = Latin America & Caribbean; MNA = Middle East & North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. See Appendix Table A.1 for country codes.

The context for providing TVET is changing rapidly, as rewards rise for workers with the right skills for in-demand jobs. Megatrends—globalization, technological change, demographic shifts, and climate change—are likely to continue disrupting the skills demanded and the broader world of work. The evidence suggests disparities in labor market returns may be growing because of these interrelated trends. These dynamics increase both the necessity of and the potential payoffs from TVET reform (see, e.g., World Bank 2019b; ILO 2019). They also have significant implications for the delivery of TVET in L/MICs, including by offering leapfrogging opportunities through, for example, the use of technology for distance learning and for practical training (Hoosen et al. 2021).

Moreover, the COVID-19 pandemic has demonstrated that, despite challenges, TVET systems can be responsive to rapid shifts in skills demand. In an ILO-UNESCO-WB survey, conducted early in the pandemic, TVET providers in 92 L/

MICs reported offering distance learning online and offline. However, differences in the ability of systems to switch from in-person to remote instruction and to ensure equitable access for vulnerable students, illustrated the extent of the digital divide between and within countries (Figure O.3). At the same time, the crisis has shown that TVET's focus on practical skills and its potential to deliver short-term, targeted, and modular training can be harnessed to rapidly upskill and reskill essential workers. In Haiti and Uruguay, for example, healthcare workers were rapidly trained on prevention and control of COVID-19 infection and provision of ICU care, and new workers were hired for contact tracing (Hoftijzer et al. 2020; Allin et al. 2020).

Figure O.3: Lower-income Countries Were Less Able to Provide Learning Continuity for TVET Students During COVID-19



Source: ILO-UNESCO-World Bank 2021 data.

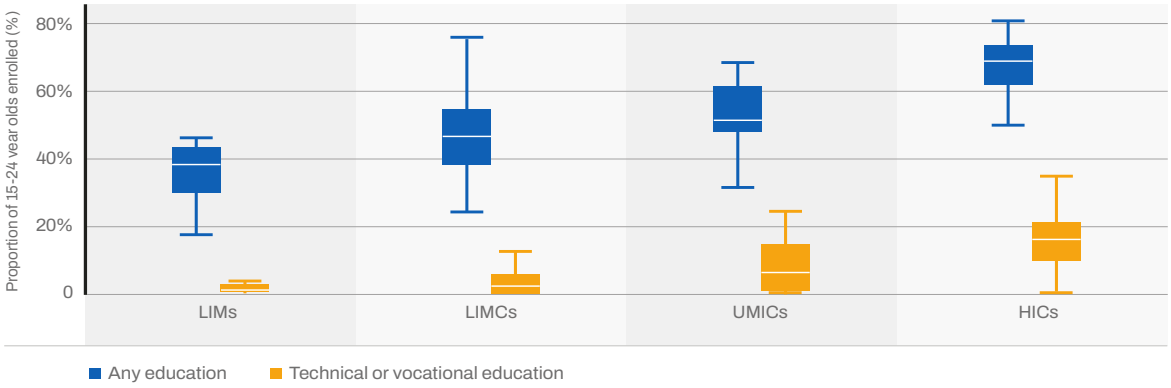
Note: LICs = Low-income countries, LMICs = Lower-middle-income countries, UMICs = Upper-middle-income countries, HICs = High-income countries.

With its unique focus on practical, work-related skills, TVET can enhance the employability of youth and adults in L/MICs and thus help to address skills constraints while responding and adapting to megatrends. Well-functioning TVET systems can better align skills supply and demand and adjust their offerings relatively quickly to meet changing labor market needs, thus helping countries to meet the Sustainable Development Goal (SDG) of "promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all." This can be achieved in part by increasing access to higher-quality jobs in the digital and greening economies through, for example, green skills development, work-based learning (WBL), and flexible skills certification and recognition (UNESCO 2016; OECD 2019). This is the TVET promise, but one that too often goes unmet. Understanding how and why TVET systems fall short of expectations calls for reflection on the specific challenges of TVET in L/MICs and how they can be addressed to improve TVET's contribution to the productivity and employment objectives in support of sustainable economic development.

PART 2
The TVET Challenge
Improving Access, Equity, Quality, and Relevancet

Formal TVET systems in L/MICs often seem small given obvious skills gaps and the magnitude of the employment and productivity challenges. TVET in L/MICs enrolls relatively few students, both compared to the number in corresponding levels of general education and to TVET enrollment in high-income countries (HICs). On average, the share of youth in TVET increases with a country's income per capita (Figure O.4), and it is below 10 percent in all regions except for Europe and Central Asia (ECA). TVET enrollment is particularly low in Sub-Saharan Africa (SSA) and South Asia (SAR). These differences partly arise because fewer youth in poor countries participate in education of any type. They also reflect the fact that in HICs, more learners enroll in TVET than in general education. At all country income levels, upper-secondary vocational students generally make up the bulk of TVET learners, with lower-secondary and post-secondary non-tertiary TVET students comprising much smaller shares. Moreover, formal TVET learners are concentrated in initial (pre-employment) training, with only a very small proportion of the workforce engaging in continuing formal TVET (Cedefop 2019).

Figure O.4: Participation of 15- to 24- year-olds in Vocational Education Increases with Countries' Income Levels



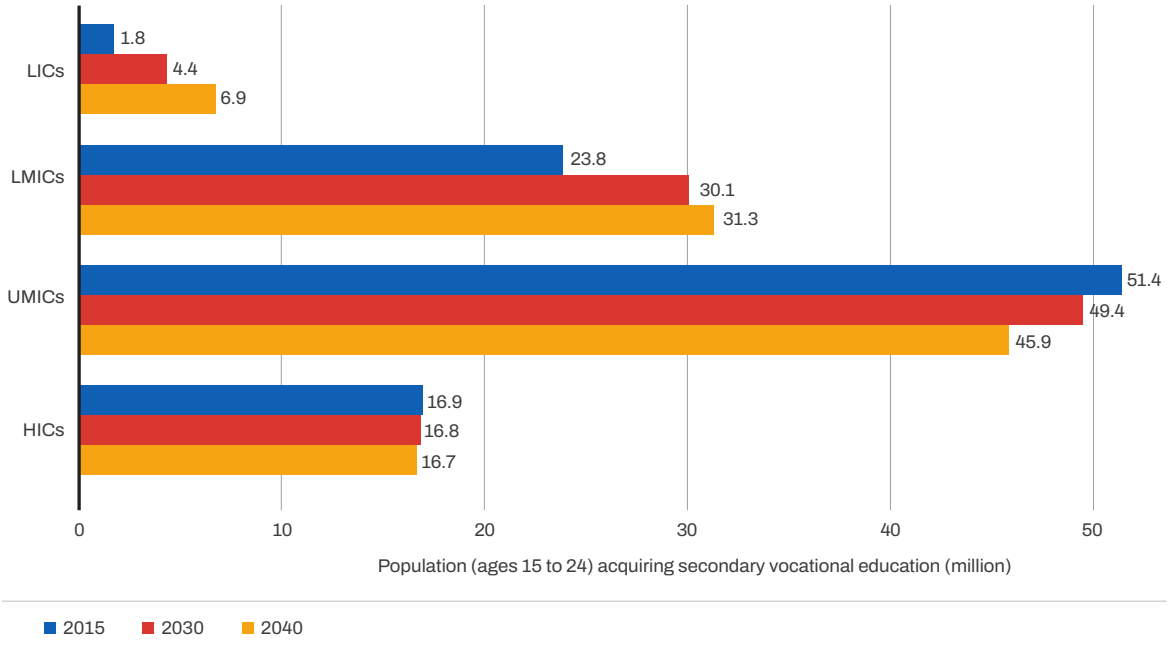
Source: UNESCO Institute of Statistics & ILO Statistics.

Note: The percentage of 15-24-year-olds enrolled in education was calculated by dividing the number of people 15-24 years old in education by the population of that age group in the country as provided by ILO Statistics. The line inside the box represents the median of the distribution. The lower end of the box represents the 25th percentile, and the upper end represents the 75th percentile. The lines outside the box represent the highest and lowest values excluding outliers. For each country, the latest available data for the period 2011 to 2022 was included. Data points for enrollment are for 118 countries. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries, HICs= High–income countries. While the composition of countries in "any education" and "technical or vocational education" differs somewhat for each country group, the conclusion remains the same with the smaller sample of countries that have data for both variables.

In the coming decades, demographic trends and rising completion rates at lower levels of education will generate pressure for TVET systems to expand, particularly in LICs. From 1970 to 2020, TVET systems in L/MICs shrank relative to general education. Based on panel data for 42 countries, the percentage of secondary students attending vocational programs declined from 17 to 11 percent. In the recent past, however,

things have stabilized. Based on country panel data from 72 L/MICs, the percentage of secondary students enrolled in vocational programs rose slightly, from 8.6 percent in 2000 to 11.3 percent in 2020.[3] If student preferences for general or technical education do not change substantially, demographic trends and higher completion rates at lower levels of education are likely to cause TVET to expand, particularly in LICs and LMICs (Figure O.5). Indeed, in the next two decades, the number of youths with secondary TVET degrees can be expected to more than quadruple in Burundi, Liberia, Mali, Mozambique, Senegal, Tanzania, and Uganda, and increase six-fold in Sudan and ten-fold in Niger.[4]

Figure O.5: The Size of the TVET System is Likely to Increase in LICs and LMICs



Source: Methodology from Arias et al. 2019.

Note: Barro-Lee data are used for projections of education attainment by country and UNESCO Institute of Statistics data for the share of secondary students in vocational education. The population aged 15–24 acquiring secondary vocational education is calculated as the population with at least secondary education multiplied by the share of vocational students in secondary education. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries,HICs = High-income countries.

This potential for expansion should be considered in the context of TVET currently absorbing disadvantaged learners with weaker foundational skills and being considered a second-tier educational track. Even when controlling for a series of demographic and educational characteristics, TVET students often come from more disadvantaged (though not poor) households compared to their peers in general education (Figure O.6).[5] Socioeconomic status can affect not only entry into TVET, but the choice of specialization (World Bank 2015). With some exceptions, particularly in Latin America and the Caribbean (LAC), the foundational skills of secondary students in vocational programs are weaker than those of their peers in general programs, affecting both their readiness for learning occupation-specific technical skills and their labor market

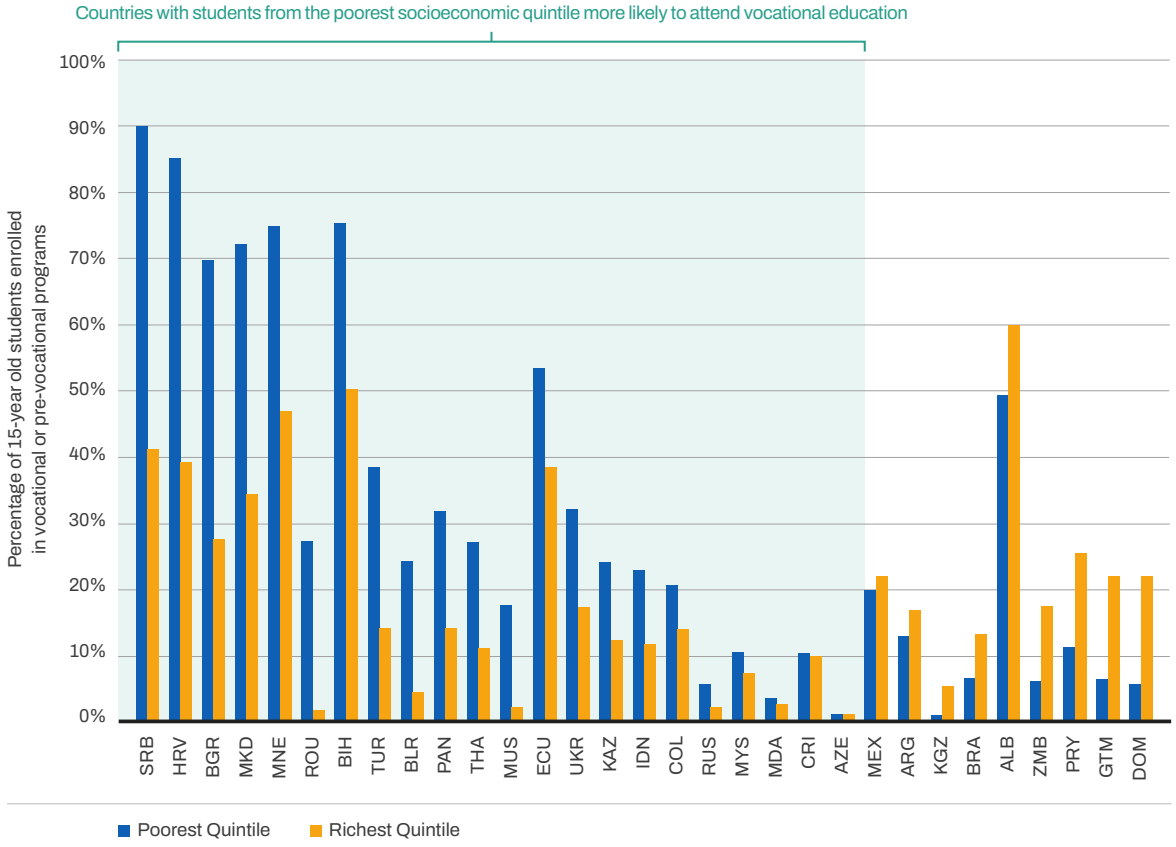
3 UNESCO Institute of Statistics data. If data for reference years is missing, values for the closest year within five-year periods centered on reference years are used to represent values for the reference years.

4 Methodology follows Arias et al, 2019.

5 This issue is not unique to L/MICs: evidence from more advanced European economies, with stronger TVET systems, shows a similar proportion of more disadvantaged students having been directed into TVET (Kuzmina and Carnoy 2016).

outcomes after graduation. Results from the Programme for International Student Assessment (PISA), for example, show that in most of the 35 L/MICs participating in the assessment, 15-year-old secondary students in vocational programs performed worse than their general secondary peers on basic cognitive skills like mathematics (Figure O.7A) and on important socioemotional skills like growth mindset (Figure O.7B).[6]

Figure O.6: Secondary School Students Belonging to the Poorest Quintile in L/MICs Are Often More likely to be Enrolled in TVET than their Peers from the Richest Quintile



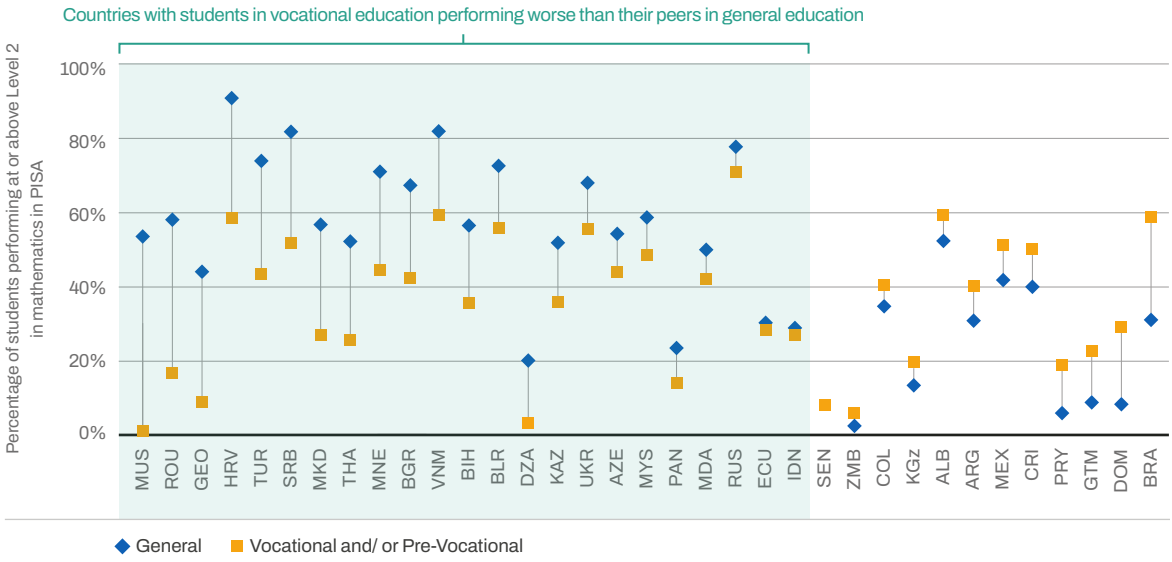
Source: Data from PISA 2003, 2006, 2009, 2012, 2015, 2017 (PISA-D) and 2018.

Note: Socioeconomic status is defined based on the OECD Index of Economic, Social, and Cultural Status, a composite measure of parental education, parental occupation, and household assets. Data sorted by gap between poorest and richest quintiles in the share of students attending vocational education. See Appendix Table A.1 for country codes.

6 More recent data for individual countries such as South Africa (Pugatch 2014), Ghana and Kenya (Arias et al. 2019), and China (Wang 2017) also point at TVET learners having less academic preparation. A study in Austria, Croatia, and Hungary found that this sorting of "weaker" students into TVET, whether voluntary or enforced, takes place in HICs as well (Kuzmina and Carnoy 2016).

Figure O.7: Secondary Students in TVET Generally Trail Peers in General Programs in Foundational Mathematics Skills and Growth Mindset, with Some Exceptions, Especially in LAC

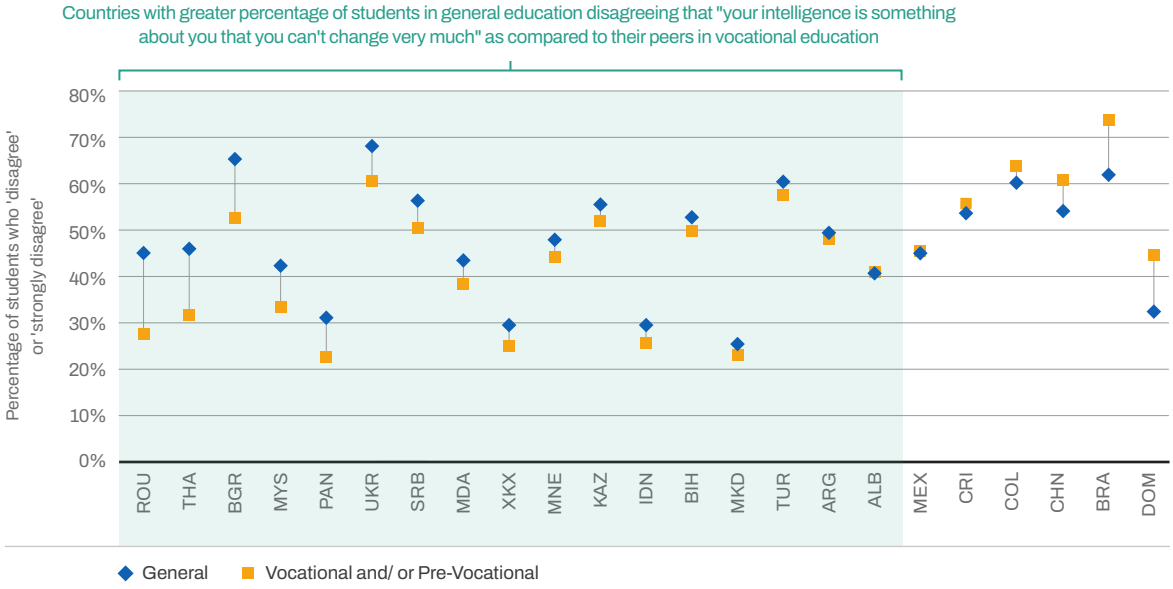
A) Mathematics



Source: Data from PISA 2003, 2006, 2009, 2012, 2015, 2017, 2018.

Note: Basic proficiency is defined as Level 2 in PISA. Countries sorted by the gap in proficiency between vocational/pre-vocational and general students. Similar results are observed for reading. See Appendix Table A.1 for country codes.

B) Growth mindset

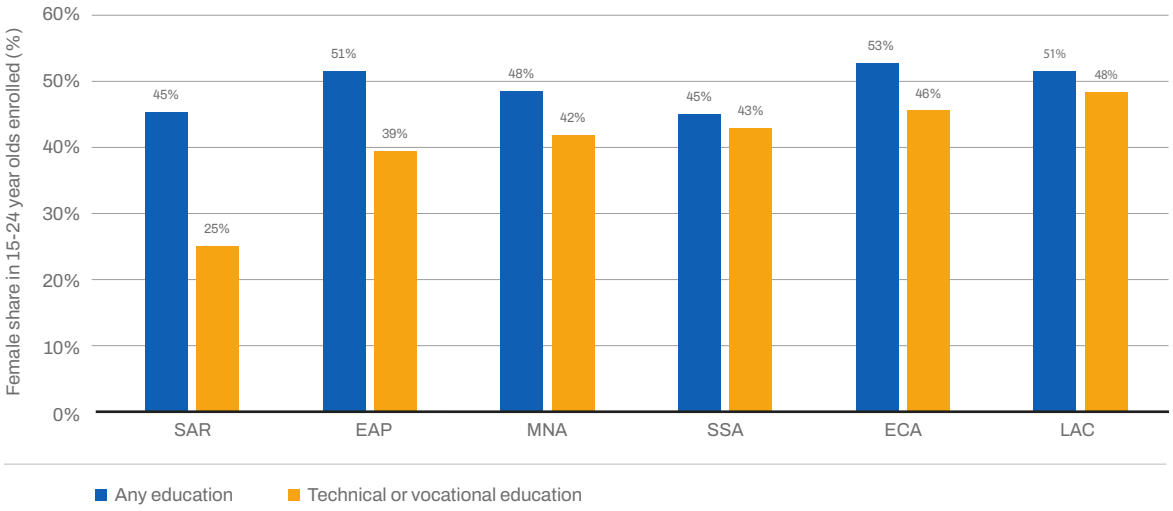


Source: PISA 2018 data; OECD 2021d.

Note: Disagreeing with the statement "Your intelligence is something about you that you can't change very much" is considered to be a precursor of a growth mindset, so students who disagreed with the statement are considered to have a stronger growth mindset than students who agreed with it. Countries were sorted by the gap in disagreement with the statement between vocational/pre-vocational and general students. See Appendix Table A.1 for country codes.

Despite attracting relatively disadvantaged learners, TVET systems still exclude many, with women less likely to be enrolled in TVET, and when enrolled, are more likely than men to specialize in fields with lower labor market returns. There is an enrollment gender gap in TVET in all regions, even where women are more likely to be in education (Figure O.8). Female TVET students are often most underrepresented in science, technology, engineering, and mathematics (STEM) fields. Since male-dominated occupations typically pay more, this gender segregation in fields of study translates into future earnings inequalities. Because this is a misallocation of talent, exclusion of women from higher-demand TVET fields is detrimental to the economy (World Bank 2011).

Figure O.8: Women are Less Likely to Be Enrolled in TVET as Compared to Men



Source: UNESCO Institute of Statistics and ILO Statistics data.

Note: Covers L/MICs with latest available data for the period from 2011 to 2022, excludes HICs. Regions sorted by average adjusted gender parity index. Data points for enrollment in overall education for 110 countries. While the composition of countries in "any education" and "technical or vocational education" differs somewhat for each country group, the conclusion remains the same with the smaller sample of countries that have data for both variables. EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa.

For students in L/MICs who are able to access formal TVET, the evidence on average impacts on employment and productivity is at best mixed. Studies examining the labor market outcomes of TVET are generally either impact evaluations of specific programs or observational studies examining labor market returns by educational attainment. The few rigorous impact evaluations and more numerous observational studies of formal secondary TVET in L/MICs suggest that the impacts on graduates' labor market outcomes can be positive but are often small and almost always highly heterogeneous. In several contexts, however, vocational secondary education appears to yield no returns in terms of employment or earnings (see Table O.1).

Table O.1: The Evidence on Average Impacts of TVET on Employment and Earnings is, at Best, Mixed

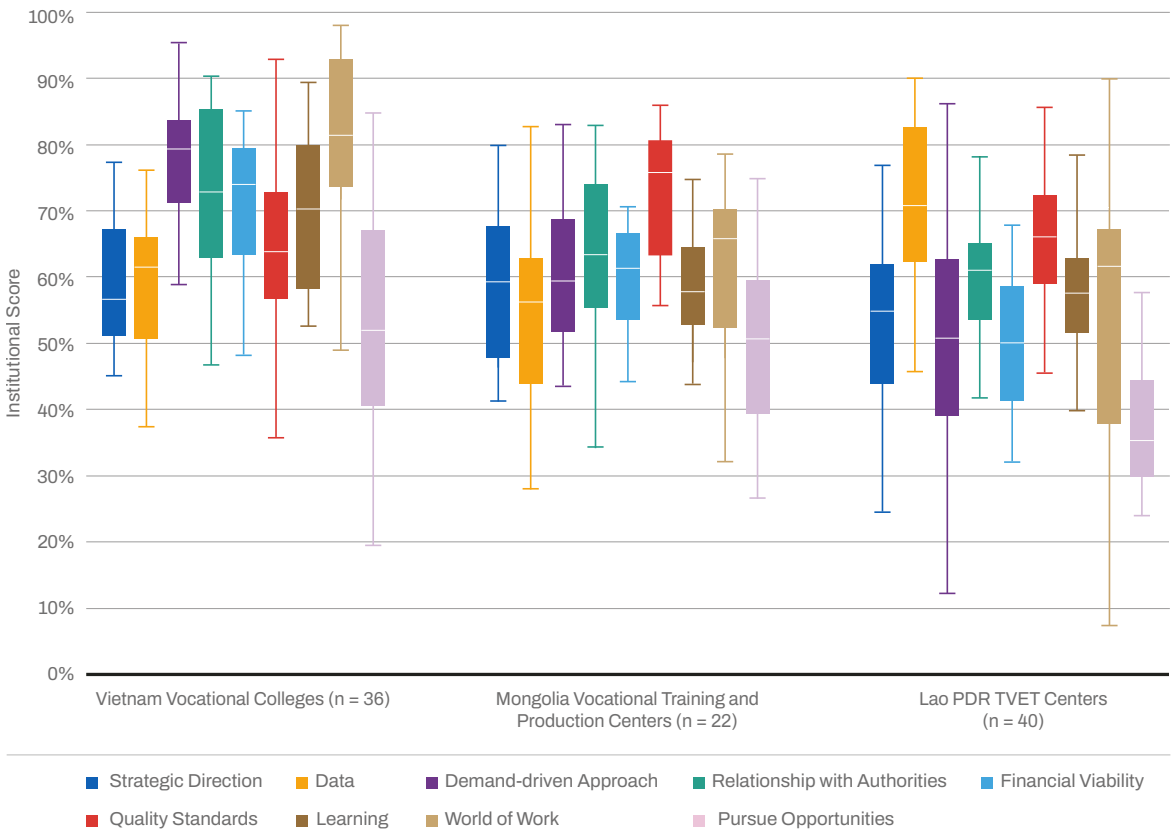
	Impact evaluations		Observational studies		
	Positive impacts	No impacts	Better than general	Similar to general/ mixed	Worse than general
Employment	3 (MNG, NPL, BRA-women)	4 (NMB, SLV, TUR, BRA-men)	—	—	—
Earnings	4 (NPL, BRA-women, MNG-women, KEN-wage earners)	6 (NMB, SLV, TUR, BRA-men, MNG-men, KEN-nonwage earners)	6 (BRA, CHN, EGY, LKA, THA, TUR)	5 (IDN, IND, PHL, ROU, TZA)	4 (EGY, PAK, RWA, SUR)

Source: Impact evaluations: Mongolia (MNG): Field et al. 2019; Nepal (NPL): Chakravarty et al. 2019; Brazil (BRA): Camargo et al. 2018; Kenya (KEN): Hicks et al. 2016; Namibia (NMB): Borkum et al. 2017; Türkiye (TUR): Hirshleifer et al. 2016; El Salvador (SLV): Campuzano et al. 2016. Observational studies (conducted through Mincer regressions): Egypt (EGY): El-Hamidi 2006; Sri Lanka (LKA): Riboud et al. 2007; Thailand (THA): Moenjak and Worswick 2003; Brazil (BRA): Almeida et al. 2015; China (CHN): Guo and Wang 2020; India (IND): Riboud et al. 2007; Romania (ROU): Malamud and Pop-Eleches 2008; Tanzania (TZA): Kahyarara and Teal 2008; Indonesia (IDN): Newhouse and Suryadarma 2011 & Mahirda and Wahyuni 2016; Pakistan (PAK): Riboud et al. 2007; Rwanda (RWA): Lassibille and Tan 2005; Egypt (EGY): Krafft 2018; Suriname (SUR): Horowitz and Schenzler 1999; TUR: Patrinos et al. 2019.

All in all, TVET is a risky investment even if it can pay off for many. Most TVET systems are not simply good or bad; the TVET landscape in most countries is diverse, and employment and wage outcomes can vary widely by field of study and institution type as well as graduates' personal characteristics, and over time. This high heterogeneity in returns across and within fields of study has been documented in Kenya (Arias et al. 2019), Ghana (Arias et al. 2019) and Türkiye (Aydede and Orbay 2016) for example. Similarly, graduates of formal short-term training courses in Bangladesh experienced very different employment rates six months after graduation, depending on their field of study and type of training provider (World Bank 2015). TVET returns also seem to vary significantly over an individual's working life because TVET learners often have a more successful school-to-work transition than general education graduates, but their prospects seem to deteriorate over time, at least in relative terms (see, e.g., Hampf and Woessmann 2016; Hanushek et al. 2017; Lamo et al. 2011; Woessmann 2019; and OECD 2020).

Within countries, performance can vary considerably by TVET institutions. The Training Assessment Project (TAP) assessed providers in seven jurisdictions in the East Asia and Pacific Region (EAP), five countries in Europe and Central Asia (ECA), and one in Sub-Saharan Africa (SSA). It found that institutions, even of the same type and in the same country, can differ highly in their management practices, which may explain some of the variation in returns (Figure O.9).

Figure O.9: High Heterogeneity in Institutional Performance among Similar TVET Institutions Within Countries



Source: Training Assessment Project (TAP) data.

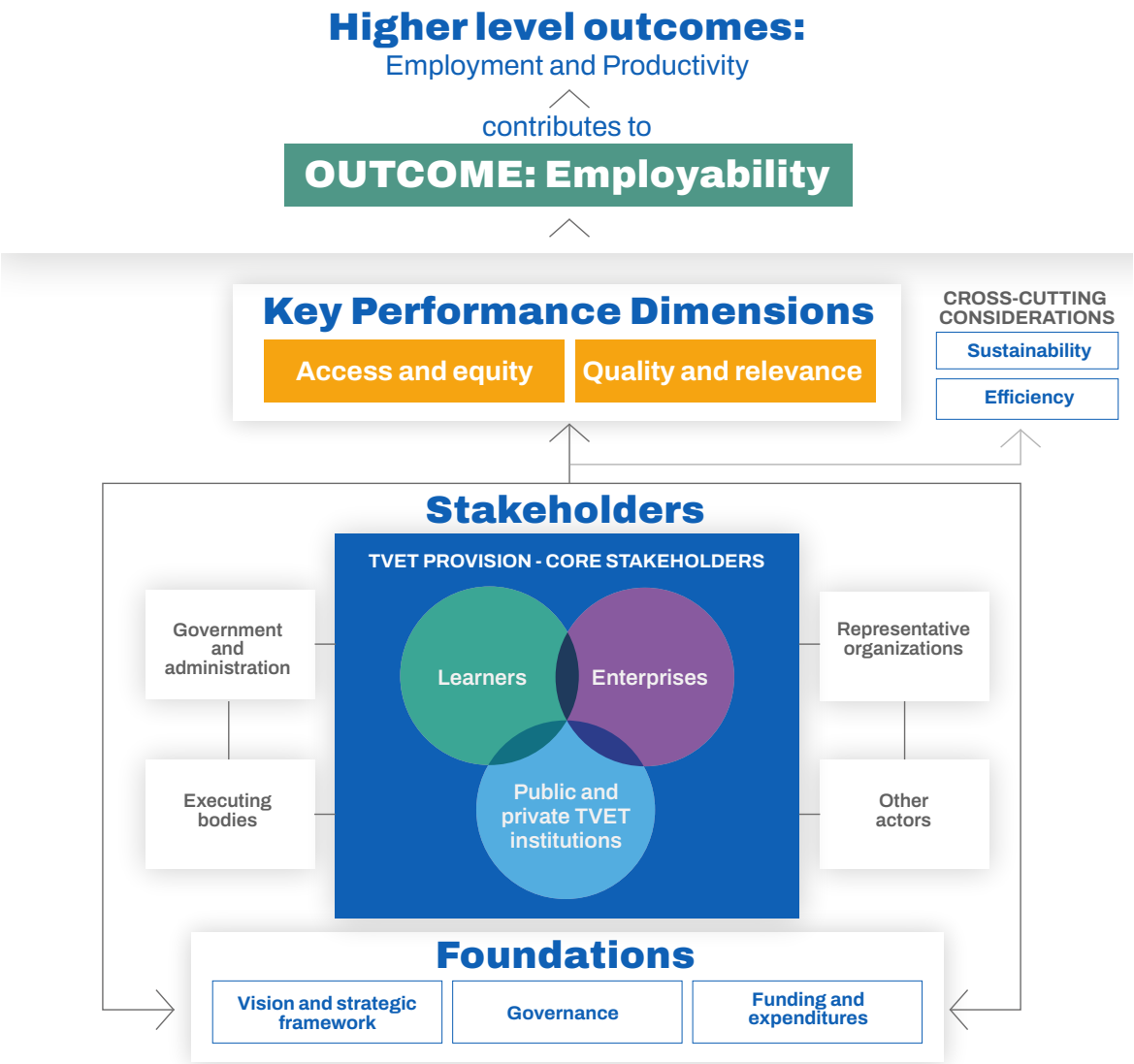
Note: The figure shows institutional scores on the action areas. Scores up to 25 percent indicate that the institution may be at a latent degree of practice, suggesting need for significant reforms. Emerging practice is indicated by a score of 26–50 percent, indicating that in that area the institution has some elements of the action area aligned to global good practice to build on. Established (51–75 percent) and Advanced (76–100 percent) reflect institutional practices better aligned with global good practice. The bottom of the box is the 25th percentile and the top the 75th. The horizontal line is the median value. The vertical line denotes minimum and maximum values (within 1.5 times the interquartile range of the value at the 25th and the 75th percentiles). "n" denotes the number of observations.

The high heterogeneity in TVET performance between and within countries reflects fundamental weaknesses. The capacity of TVET systems to enhance graduate employability and thus contribute to better employment and productivity that will support sustainable economic transformation hinges on (1) the system's ability to provide access, equity, quality, and relevance in training, which itself relies on (2) productive engagement with stakeholders, particularly the main participants in TVET— learners, TVET institutions, and enterprises[7]; and (3) strong foundations in terms of vision, strategic framework, governance, and funding and expenditure mechanisms (Figure O.10). Successful and promising reforms address constraints in these key areas, often together, recognizing their interdependence. As L/MICs build, shape, and improve how they offer TVET, other countries' reform efforts can provide useful lessons.

7 In this report, we define enterprises widely to encompass private, non-governmental, and public employers regardless of size or whether they are formal or informal, self-employed, or household enterprises.

PART 3
The Way Forward to Better TVET
Six policy priorities to achieve three transformation

Figure O.10: TVET for Employment and Productivity to Support Sustainable Economic Transformation: A Conceptual Framew



Source: Based on Arias et al. 2019; UNESCO/ILO 2018; World Bank 2013; ILO 2008.

Note: In this report, "employability" is used to refer to the chances of obtaining and maintaining productive employment; "enterprises" and "employers" are used interchangeably to refer to both firms in the private sector and those in the non-governmental and public sectors.

It is possible to repair the broken link between TVET systems and labor markets, but reforms need to be realistic in terms of expectations and logical in sequencing. The experience of advanced economies in Europe and East Asia and several L/MICs demonstrates that reforming TVET systems can bring about real change and result in higher quality and more responsive education and training that is accessible to a more diverse population of learners. Technological innovations in TVET delivery, some created or tested during the pandemic; more ways to collect and analyze data, and better documentation of reforms in other countries have opened leapfrogging opportunities. As countries embark on TVET reforms, however, the range of past efforts and previous returns are reminders of the importance of being realistic about what reforming TVET can achieve, particularly in the short term. They also remind us to think hard about the role of government in education and to give priority to public action in areas where market failures are most obvious.

While desirable TVET reforms will differ based on local constraints and mechanisms to generate change, there are common threads in the direction of reforms that all L/MICs can strive for, what we identify as Three Transformations for Better TVET, or Three Es.

- The **first transformation** is from striving for recognition to striving for **Excellence**. This means moving TVET from being perceived (rightly or wrongly) as a second-best education track with limited opportunities to continue learning and suboptimal and highly variable returns to a track that guarantees demand-driven qualifications and equitable acquisition of skills through flexible hands-on instruction based on high-quality inputs.

- The **second transformation** is going from a focus on inputs to a focus on **End Results**. This refers mostly to reforming the foundations of TVET governance and financing in order to ensure greater autonomy for TVET providers together with better accountability for results, supported by more effective interactions between stakeholders.

- The **third transformation** is from decisions based on conjecture to decisions based on **Evidence**. Currently, the TVET system largely operates in the dark, particularly compared to other education subsectors. Building a robust evidence base of effective L/MIC interventions and reforms, and building up systems for collecting, analyzing, and using data are essential if TVET is to be improved.

Transforming the system towards excellence, end results, and evidence is underpinned by six policy priorities that address critical common bottlenecks in L/MICs. Transforming the system towards excellence, end results, and evidence is underpinned by six policy priorities that address critical common bottlenecks in L/MICs (Figure O.11). These priorities help explain at least some of the heterogeneity in performance found in TVET systems across and within countries and in its current contribution to employment and productivity. Policy priorities are often complementary and, in many ways, priorities under the second and third transformations also support the first transformation towards excellence. Below each transformations and the respective policy priorities are unpacked in more detail.

Figure O.11: Three Transformations and Six Policy Priorities to Achieve Better TVET

O. 3. 1.
The First Transformation: From Striving for Recognition to Striving for Excellence

TVET systems in L/MICs face many barriers to excellence and must often vie for recognition and resources. Many students enter TVET with significant gaps in foundational skills. Providers often lack the incentives, resources, or know-how to foster the skills demanded by the labor market. Engagement with enterprises, which can identify the skills necessary and support updating of TVET curricula, equipment, teachers' knowledge, or assessment of student competencies, tends to be rare or ad hoc. Achieving excellence thus requires addressing these barriers and guaranteeing demand-driven and equitable acquisition of relevant skills. Reforms to heighten Excellence entail thinking deeply about who the main clients of the system are so that it can become more responsive to their needs; what skills to provide, given gaps in foundational skills at entry and labor market needs; and how to deliver those skills through an integrated ecosystem with flexible pathways between TVET and general education, hands-on approaches including WBL, and quality teachers, resources, and infrastructure.

PRIORITY 1.

The Who: Focus on both enterprises and learners as the main clients and become more responsive to their needs

To better serve enterprises, TVET must be more demand-driven. There is broad recognition among policymakers and TVET providers of the vital role of enterprises in the TVET ecosystem (ILO 2020). Yet, in most L/MICs enterprises do not contribute critically to designing and carrying out TVET strategies—perhaps from lack of interest, little awareness of partnership opportunities, concerns about transaction costs, and skepticism about the value of such partnerships (World Bank 2017a; ILO 2020). TVET systems can promote the participation of enterprises in TVET governance through, e.g., sector skills councils or similar structures. Bangladesh, Brazil, Ghana, Mozambique, Namibia, the Philippines, South Africa, Sri Lanka, and Uganda already have such arrangements, and they are becoming increasingly common, but to date, the limited evidence on their effectiveness is mixed (ILO 2020). Innovative experiences of public-private TVET partnerships, as in Egypt (UNESCO 2020) and India[8], can also provide lessons on modes of engagement.

Reforms to make TVET systems more demand-driven could prioritize strategic sectors where demand-side reforms are underway to align interests and ensure returns to investments. This is being done, for example, using public-private partnerships in the automotive sector in Ghana,[9] Morocco (MCC 2020), and South Africa (UNDP South Africa 2021). Skills training funds can also be used to catalyze training in priority sectors. The Punjab Skills Development Fund (PSDF) in Pakistan, which started out in 2010 as a small pilot in a few provinces, uses in-depth market research to identify critical sectors and their skills needs (Hilton 2018); PSDF has since been scaled up to support over 500 providers of training in over 250 trades.[10] Another strategic approach establishes Centers of Excellence to serve as demonstration models as done in Mozambique (World Bank 2020b and Mongolia (Field et al. 2019), for example. Excellence can also be promoted through flagship institutes in cooperation with other countries to lower the costs of training programs, facilitate mobility of skilled labor, promote peer learning, and increase the supply of skilled workers for regional economic corridors. Kenya, Ethiopia, and Tanzania collaborate in this way through the East Africa Skills Transformation and Regional Integration Project (EASTRIP), which supports a cluster of Regional Flagship TVET Institutes (World Bank 2018a).

At the same time that TVET becomes more demand-driven, it must also become more student-centered. TVET can empower learners by supplying them with timely and user-friendly information on their aptitudes, provider program offerings, labor market data by occupation, and by providing tailored support from admission through graduation and during their transition to jobs. Skills assessments and career guidance can shape learners' aspirations and labor market expectations. For example, South Africa's Youth Employment Service (YES) program now has a profiling tool,

8 See https://www.sscnasscom.com/, accessed April 13, 2022.

9 "Modern West African Vehicle Academy to boost automotive industry as competitive sub-regional hub launched" (https://www.myjoyonline.com/modern-west-african-vehicle-academy-to-boost-automotive-industry-as-competitive-sub-regional-hub-launched/).

10 https://www.psdf.org.pk/.

SkillCraft, that evaluates a learner's executive functions, behavior, and mindsets that are predictive of labor market success and provides immediate, personalized, and interactive skills assessment and career guidance feedback (World Bank 2022). Once learners are empowered, TVET programs can select those more likely to benefit from training. The Generation program, which prepares participants for middle-skill service jobs and has very high placement rates through direct engagement with employers, recruits students based on their intrinsic motivation and effort and screens them during intensive 4–12 week "boot camps."[11]

While selecting TVET students based on aptitude and motivation is likely to improve completion rates and average labor market outcomes, it can also lead to exclusion if not coupled with measures to address the inefficient barriers that limit access to learning and obstruct the school-to-work transition particularly for the vulnerable. Female participation in TVET can be improved by expanding outreach efforts and using financial incentives. For example, the Bangladesh Skills and Training Enhancement Project (STEP) was able to push up women's enrollment in TVET from 5 to more than 20 percent in part by offering stipends for all female students in supported polytechnics and conducting awareness-raising campaigns (World Bank 2019a). Besides attracting women into TVET, it is important to address the high occupational gender segregation in many L/MICs; this phenomenon is partly rooted in women choosing fields of study with lower expected labor market payoffs (Sahoo and Klasen 2018). Information interventions coupled with mentorship opportunities can help: In the Republic of Congo, information on trade-specific returns increased women's likelihood of applying to traditionally male-dominated trades, particularly for women who had experience or male role models in these trades (Gassier et al. 2022).

Once they enter TVET, students from disadvantaged groups may require not only safe and inclusive learning environments but also tailored support to prevent early dropout. Early warning systems, such as the one Guatemala undertook for the transition from primary to lower-secondary school (Haimovich et al. 2021), can identify high-risk students and provide them with targeted interventions, such as academic assistance and financial support, as Brazil does with Bolsa Formação scholarships (Portela et al. 2015).

PRIORITY 2.

The What: Foster a portfolio of skills by prioritizing foundational skills both at entry into TVET and within TVET programs, and by imparting the technical skills demanded by the relevant labor market

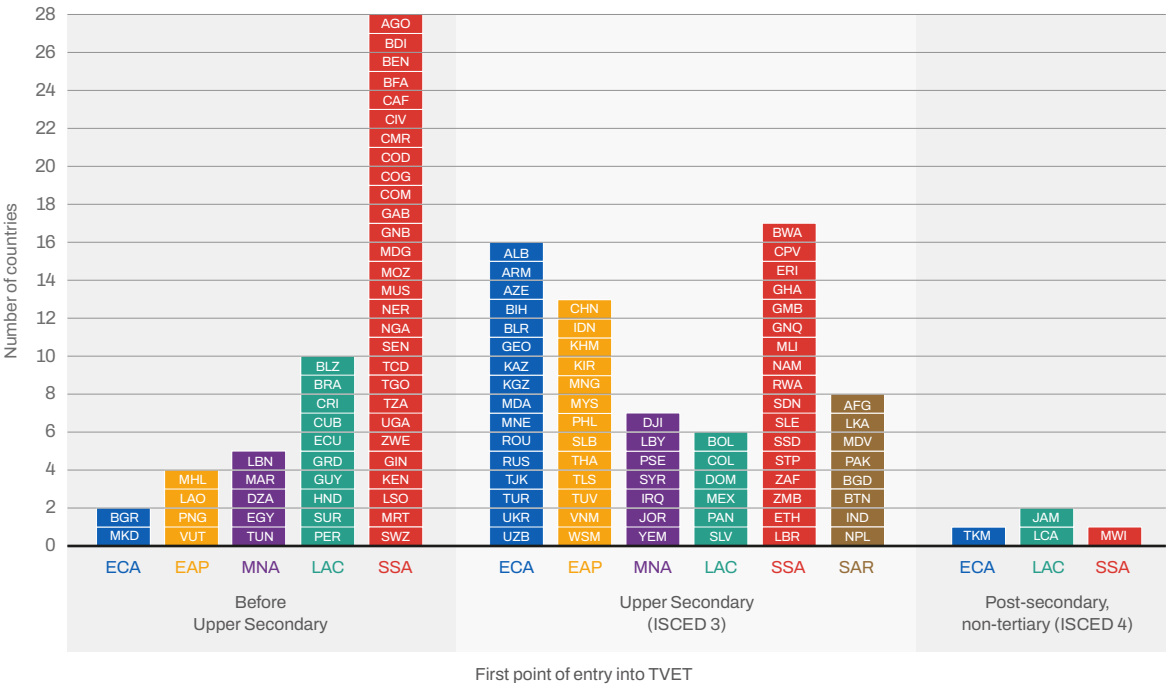
To prepare graduates for the ever-changing world of work, L/MIC education systems need to prioritize early acquisition of foundational skills, before entry into TVET. In Algeria, Azerbaijan, Georgia, Mauritius, and Senegal, less than 10 percent of secondary vocational or pre-vocational students was functionally literate (able to achieve PISA's minimum proficiency level in reading). The megatrends affecting the nature of work have been pushing up demand for foundational skills – including basic literacy, numeracy, and socioemotional skills like openness, perseverance, and teamwork (World Bank 2019b; Arias et al. 2019; ILO 2021b). These skills are important to both achieving better

11 https://www.generation.org/about.

labor market outcomes and supporting lifelong learning. Moreover, even occupations in traditional industries, such as machinery, are increasingly seeking socioemotional skills like negotiation, leadership, and teamwork. Ideally, foundational skills are acquired in basic education; however, in many LICs and even MICs, learners arrive in TVET classrooms painfully lacking these skills. Bridging programs, like those piloted by Cambodia, can prepare students with weak foundational skills by having them attend accelerated remediation programs before they enter TVET (Asian Development Bank 2014).

It is also important is to avoid premature entry into TVET. Currently, about 50 L/MICs allow TVET entry before upper-secondary education, which can imply insufficient time for students to acquire the necessary foundational skills (Figure O.12). Indeed, when entry into TVET was delayed by a year in Poland, student academic performance improved (Jakubowski et al. 2016). However, such policy changes need to be carefully designed to avoid unintended consequences, such as the early dropout of male students observed in Croatia after a similar reform (Zilic 2018).

Figure O.12: In L/MICs, TVET Often Starts Too Early



Source: UNESCO Institute of Statistics: http://uis.unesco.org/en/isced-mappings. See Appendix Table A.1 for country codes.

There is also increasing recognition that TVET systems need to continue building the core cognitive, digital, and socioemotional skills the labor market rewards. Whatever foundational skills students bring into TVET can and should be reinforced alongside more technical competencies. There are two general approaches for integrating foundational or transversal skills into TVET curricula (UNESCO 2015). The first is to create stand-alone courses, such as the Industrial Training on Soft Skills module in Malaysia's polytechnics, which exposes students to the basic theory underpinning transversal skills before practical training. The second approach integrates acquisition of foundational and transversal competencies into technical subjects, as Vietnam's Hung Yen University of Technology and Education does, to

train students in technical courses on time management and prioritization through flexible and positive teaching methods.

Technical skills taught in TVET programs need to respond to the reality of the labor markets open to graduates, which in many L/MICs means responding to the needs of self-employment and the informal economy but also the transition to more digital and greener economies. L/MIC labor markets are still highly informal, with considerable self-employment or employment in micro-enterprises. TVET curricula should reflect this reality. In particular, programs should consider incorporating entrepreneurship in training to prepare students for successful self-employment or for managing a small business. Inspiration can be drawn from the Educate! program, implemented in Uganda, Rwanda, and more recently Kenya, which conducts an innovative curriculum for upper-secondary students, focused on entrepreneurship and employability; this program has generated higher income, employment, and business ownership, particularly for females (BRAC 2018). Providing students with advanced digital skills can enable graduates to look beyond the local labor market for opportunities in the global digital economy. For example, Pakistan's PSDF has partnered with Coursera to sponsor internationally-recognized hybrid and online courses offered by leading universities, mostly on digital specializations, such as graphic design, digital marketing, game design and development, and IT support (BRAC 2018). Finally, given the accelerating transition to low-carbon economies in many L/MICs, TVET programs should work to provide more of the skills greener jobs require. For example, EASTRIP in Kenya, Ethiopia, and Tanzania has prioritized support for training related to work in areas like clean energy (geothermal, hydropower) and clean transport (railways) (World Bank 2018a).

PRIORITY 3.

The How: Promote an integrated ecosystem with flexible pathways between TVET and general education, hands-on approaches including work-based learning, and quality inputs, including teachers, resources, and infrastructure

TVET systems in L/MICs need to address common stigmas about TVET and improve pathways to general education so they can attract more and better students. Often students may want to enroll in TVET but are discouraged by sociocultural stigmas about TVET, misperceptions or uncertainties about its returns, or diminished prospects of continued learning opportunities after completion (UNESCO 2021). This calls, among others, for providing better information on TVET outcomes, and improving the integration of TVET into the wider education system and creating a variety of paths between formal TVET and general education. Flexible pathways would make TVET a possible stepping stone for further studies with a clear articulation of the different options for technical secondary and post-secondary education. This would require reforms in many countries: for instance, currently more than 20 L/MICs, including 7 in SSA and 6 in MENA, have TVET systems at the secondary level that do not allow access to tertiary education for any programs offered.

Broadening options for TVET graduates also requires a smooth integration with formal, non-formal, and informal short-term training and universities as part of a lifelong training process. Considering how prevalent non-formal and informal programs

and learning on-the-job are, the lack of certification for skills acquired prevents many learners from accessing formal TVET for further studies or from effectively signaling the skills in the labor market. Recognition of Prior Learning (RPL) schemes can address this obstacle by validating professional knowledge acquired in the workplace or in formal or non-formal studies – for example, Brazil's RPL scheme is available for individuals enrolling in continuing education (UNESCO-UNEVOC 2022). Such schemes can have significant payoffs, as demonstrated by the RPL in Bangladesh, which increased the probability of finding employment and improved employment quality, including earnings and worker confidence in their skills and jobs, particularly for women (Nakata et al. 2021).

Further flexibility can be attained through modularization and provision of hybrid TVET, which can support learning opportunities at times and locations that fit learners' needs. A more modular approach to TVET can allow providers to cater to learners who may be under pressure to combine school with work. Some countries are starting to experiment with the introduction of micro-credentials that give credit for smaller learning blocks, and that can be "stacked" into aggregated certifications and qualifications but that do not need to be done immediately one after the other. These are still largely untested, but more modular programs could help reduce the inefficiency of early dropouts from longer programs. The Philippines has recently published guidance on establishing and recognizing micro-credential courses, building on its experience providing online micro-credential learning in TVET for more than 1 million adult learners during COVID-19 (TESDA 2021). For learners in remote areas, those with mobility constraints or inflexible schedules due to work, or caregiving constraints, digital TVET delivery can fruitfully expand access to learning opportunities. The accelerated take-up of digital solutions during the pandemic made clear both the possibilities and the limits of remote instruction; and there is great scope for learning from those experiences and investing in the design of remote or hybrid courses and the digital skills of learners and teachers.

L/MIC TVET systems should lean into the practical focus by promoting WBL through, e.g., apprenticeship and internship opportunities. Through practical experience—not only in labs and training center workshops but also in actual workplaces—TVET can potentially increase employability and reduce skills mismatches. Currently work-based opportunities in formal TVET are relatively scarce (Arias et al. 2019). In Kenya, there are only 500–600 apprenticeships available annually, though total enrollment in TVET is about 90,000. In Malawi, youths for apprenticeships as can be accepted. That is why countries as diverse as Cambodia, China, Colombia, the Dominican Republic, India, Senegal, and Türkiye have been working hard to expand apprenticeships (ILO Forthcoming). Strengthening the work-based learning component in TVET will require an environment that not only enables firms to provide WBL opportunities but also brings into the system the informal sector as a critical source of practical experience and future employment. The ILO has created toolkits for setting up quality apprenticeships that also give an overview of innovations in this space and provide guidance on effective apprenticeship policies, systems, and programs (ILO 2017, 2020b; Aggarwal and Aggarwal 2021). Using subsidies to demonstrate to both firms and learners the benefits of apprenticeships can be useful: in Côte D'Ivoire, such a subsidy increased the share of youths in formal apprenticeships in mostly informal firms by 53 pp and led to an impressive

increase in employer estimates of the value of work provided by apprentices (Crépon and Premand 2019). Digital technologies also have a high potential for expanding access to experiential learning and reducing equipment costs. Ecuador's ActiVaR program is piloting use by technical and technological institutes of virtual labs with computer-based and virtual reality technologies to deliver practical training (World Bank 2021).

The success of flexible and hands-on approaches requires investment in quality resources, the most important of which is teachers and trainers. TVET systems in L/MICs often suffer because teachers and trainers lack industry knowledge and experience, have weak links with industry, and their pedagogical skills are poor (Asian Development Bank 2008; Muraveva and Oleynikova 2019; Wiemann 2019; CEART 201). The shift toward competency-based training makes the challenge even greater, as shown in Malaysia, where teachers had great difficulty in moving from assessing a student's knowledge to assessing occupational and task-specific competencies (Rahman et al. 2014). Addressing the underlying challenges—among them teacher pay and working conditions, scarcity of female teachers, and few and inadequate opportunities for in-service training—is essential but takes time. While preparing the ground for such reforms, quicker fixes can be initiated strategically, such as changing recruitment or pre-service training for new instructors or developing partnerships with the private sector to hire industry trainers or conduct industrial attachments for current TVET teachers. In China, for example, where most teachers have only academic qualifications, instructors in vocational institutions are required to spend two months every two years in the industry updating their technical skills, strengthening contacts with employers, planning WBL activities for TVET students, or training in-company trainers on pedagogical practices. Teacher promotions are contingent on completing such activities (ILO 2021; World Bank 2018b). At the same time, TVET systems can identify innovative and effective teaching practices by investing in cross-program and institutional learning. In this area, the TVET sector can draw inspiration from basic education, where tools like CLASS[12] and Teach[13] analyze what happens in the classroom and draw out successful teaching practices that can guide teachers to improve.

TVET quality and relevance are also often hampered by gaps in complementary physical and digital infrastructure, equipment, and learning materials. Assessments of TVET systems across the world routinely document gaps in infrastructure and, especially important for TVET, equipment and materials. This is well-exemplified by the observation in Nigeria that "Technical and Vocational Schools are a shadow of themselves where the science equipment and laboratory apparatus are heard of, rather than seen. Where the equipment is available, it has become obsolete" (Ojerinde 2011 quoted in Akanbi 2017). The absence of appropriate digital infrastructure limits the ability of TVET systems to exploit the potential benefits of digital technology. These limitations were particularly evident during COVID-19, when learning continuity in TVET depended on the extent of integration of ICT into the social fabric of everyday life, pre-pandemic investments in digital technology, and access (for teachers and learners) to stable electricity connections, reliable high-speed internet connections, hardware, relevant software applications and content, and technical and training support (ILO et al. 2021).

12 See https://education.virginia.edu/classroom-assessment-scoring-system.

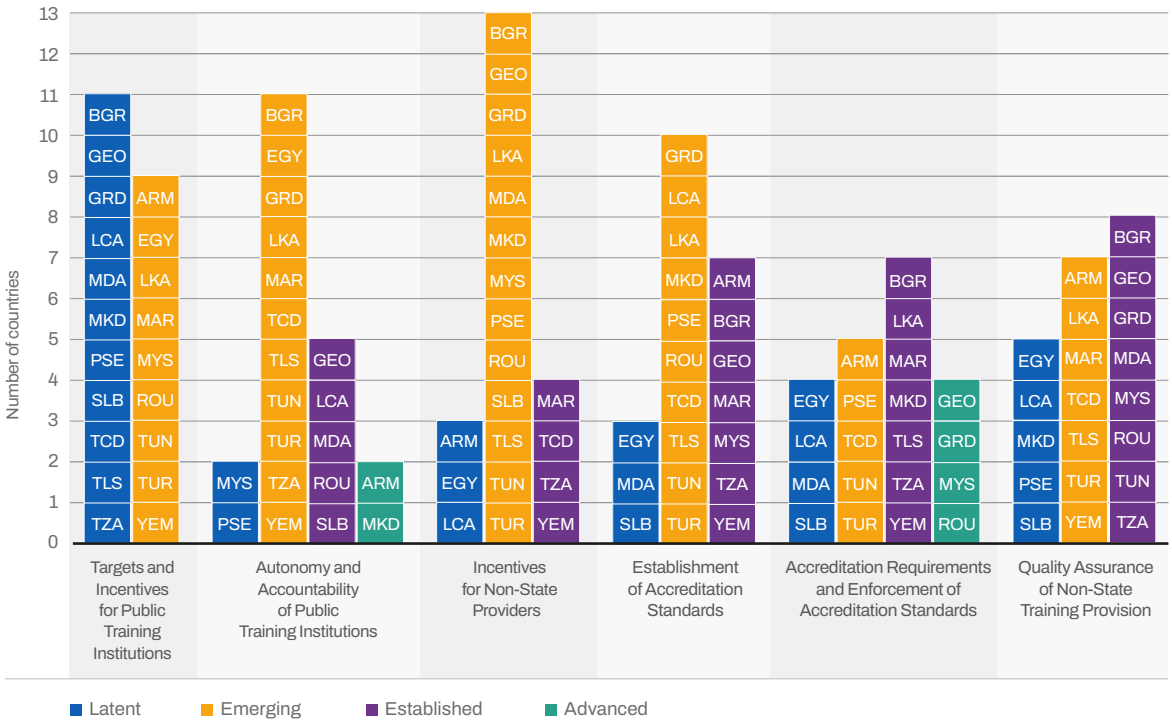
13 See https://www.worldbank.org/en/topic/education/brief/teach-helping-countries-track-and-improve-teaching-quality.

Investments in modernizing infrastructure and equipment, including digital, complement investment in teachers and would benefit from more private sector contributions. Infrastructure and equipment investments need to be supported by a reorganization and strengthening of TVET teacher development. And while these investments are likely to require additional resources, including for maintenance, more emphasis can be given to (1) increasing private sector inputs when procuring new materials and equipment to ensure they reflect the state of the art; (2) partnerships with the private sector to allow for use of equipment after hours, or at least observing use during work times, and to secure equipment donations, particularly when large firms, foreign or domestic, are making new investments; and (3) increased emphasis on WBL that can reduce institutional infrastructure and equipment needs. This is also one area where strengthening private participation in provision can help because private providers may have more up-to-date equipment (Hicks et al. 2011). Investment in digital technologies, such as virtual reality (VR) training, holds promise, particularly in contexts where access to real laboratories is scarce and building such facilities is expensive. An assessment of VR laboratories used to train learners on computer networking configuration and troubleshooting in Zambia found a statistically significant effect on performance by the group that received VR training in terms of time needed to perform tasks and no significant difference in accuracy, suggesting the potential of VR to be cost-effective (Lampi 2013).

O. 3. 2.
The Second Transformation: From a Focus on Inputs to a Focus on End Results

Today, TVET governance and financing mechanisms in L/MICs are more concerned about inputs related to students, teachers, and facilities than about labor market and education results (Figure O.13). Governments often emphasize TVET strategy and policy over implementation and evaluation. Providers, both private and public, give priority to complying with regulations rather than striving for better results for their learners and for the economy. The focus on results should permeate all aspects of the TVET system, and information on results should be fed back into both national and local decision making to strengthen accountability.

Figure O.13: There is Very Little Focus on Results in TVET in L/MICs



Source: SABER Workforce Development reports.

Note: See Appendix Table A.1 for country codes.

PRIORITY 4.

Get the balance right between autonomy and accountability of TVET providers

Decentralizing decision-making power can enhance the ability of TVET institutions to adjust training services to local needs. However, providing more flexibility while ensuring accountability is difficult. Using performance indicators to enable more transparent oversight of providers, for example, is important for making decentralized actors accountable to national institutions. However, in TVET systems that have such indicators (e.g., Egypt, Indonesia, Malaysia, Sri Lanka, Tanzania, and Türkiye), they are often measuring enrollment or factors related to budget and administration and do not measure such results as graduates' employment outcomes (see the WfD SABERs of these countries). When TVET providers are made more accountable, either through the long route of government regulation or financing or the short route of direct client power (World Bank 2003), greater provider autonomy becomes not only possible but necessary to allow providers to respond to learner and enterprise needs.

On the one hand, long-route accountability through governments' role in quality assurance can be strengthened by a simplified approach implemented gradually, taking into account capacity constraints and harnessing the power of stakeholders. So far reforms have typically given priority to assuring quality through national qualification frameworks (NQFs), setting standards, accreditation and certifications, and increasingly have been linked to competency-based training. Because these activities are very resource-intensive, they can be difficult to develop and sustain. In South Africa

and Tanzania, for example, NQFs overstretched TVET administrative capacity, and in Indonesia, drafting competency standards took so long that they became outdated before being used (Billetoft 2016; Luque et al. 2020). A better approach for L/MICs may be to begin gradually by prioritizing key sectors and occupations, accrediting institutions first and then specific programs, and focusing on the credibility of qualifications, accreditations, and certifications by seeing them as tools for learning.

Long-route accountability depends in large part on the quality of engagement with TVET stakeholders, but L/MICs have been struggling with effective coordination (ILO and UNESCO 2018). Although there is no easy solution to such challenges, some strategies are worth considering: (1) Institutionalizing broad representation by including industry and non-state providers in apex bodies and employer representatives on governing boards of providers; And (2) Introducing incentives, financial or nonfinancial: a scheme in South Africa links preferential access to government contracts with firm training of disadvantaged youth.[14] In some contexts, nonfinancial measures, such as local social recognition for contributions, can be sufficient incentive.

Long-route accountability requires significant government capacity and considerable time, so it can be a quicker win to empower learners and enterprises to hold TVET providers accountable using their client power. This is the short route to accountability. An evaluation of MCC investments in TVET in El Salvador, Mongolia, Morocco, and Namibia between 2008 and 2014 found accountability relationships, especially between employers and providers, to be a missing link for achieving impact on employment and earnings, even when projects met their objectives in terms of inputs and outputs (MCC 2020). A goal of reforms focused on short-route accountability would be to improve direct accountability between employers and providers and between learners and providers. Public-private governance, for example, can help create short-route accountability of publicly funded providers to employers. Morocco and Senegal have tried to increase the direct client power of employers by making the training provider a subsidiary of an industry association (MCC 2020). In other cases, employers can provide training directly: in L/MICs, since there are relatively few large firms that can provide training, industry organizations could be recognized as registered providers and linked to certification and qualification systems, as in the case of the PSDF in Pakistan (Hilton 2018).

Short-route accountability between learners and training providers can be strengthened by vouchers, learning accounts, or scholarships that allow learners to choose among private and public providers. Where there are enough high-quality providers or programs, vouchers and scholarships that move with the learner can reinforce client power: giving out-of-school youth vouchers for vocational training in Kenya increased enrollment substantially, and on average beneficiaries acquired an additional half year of education (Hicks et al. 2016). In Colombia, a lottery for vouchers that allowed secondary school students to attend private vocational schools led to major labor market gains compared to lottery losers, who were more likely to attend public technical or academic secondary schools (Bettinger et al. 2010). Such

14 See https://yes4youth.co.za/

programs, combined with better and more timely information on the quality of different providers and the labor market returns of different options (to be discussed in the Third Transformation) can respond better to the needs of clients.

PRIORITY 5.

Realign the financing of TVET to reward reforms and results while increasing financing in under-funded areas

Today, TVET financing is almost universally based on inputs with little to no connection to actual outcomes for learners or to reform efforts. Traditionally, many training programs have focused on tracking inputs, such as number of individuals enrolled, salaries paid, and buildings rented, with providers only expected to account for how funding was used in these areas (Ziderman 2016). Yet, financing can be a powerful tool to improve outcomes, reduce inefficiencies, and create a space for innovation in service delivery if there is a clearer focus on outcomes, including motivating learners to attend and complete the program, providing quality training, or supporting learners in accessing productive jobs. In turn, this should help crowd-in private investment and increase spending in areas that are central but underfunded, such as teacher training or work-based learning.

In recent years, an increasing number of individual L/MIC TVET programs or skills training funds have given priority to aligning funding with results through results-based financing (RBF). Three important lessons can be drawn from international experience to help tackle the main challenges of designing RBFs for TVET in L/MICs.

- **Rewarding results does not require an exclusive focus on results**. Since employment outcomes are not entirely under the control of training providers, RBF design needs to manage providers' risk by using a mix of payment metrics, from outputs, like training received, to outcomes, such as 6-month job retention (Instiglio 2018; World Bank 2020a). In Pakistan's PSDF, for example, compensation to training providers is tied 20% to learners' income generation and 80% to evaluation of training delivery, with the latter being a weighted average of, among other factors, training attendance and completion, and placement of trainees (Hilton 2018). Moreover, as change in TVET may take time, RBF can reward not only success but also the implementation of critical reforms.

- **Without due care, RBF can encourage providers to focus on easier-to-serve populations to the exclusion of the most vulnerable**. RBF schemes need to recognize that the cost of achieving outcomes differs across individuals. Contracts can be carefully designed to encourage enrollment, completion, and productive labor market insertion of youth from disadvantaged backgrounds or to promote women in non-traditional fields, for example. A combination of eligibility criteria and differential pricing for outcomes achieved by different groups are common ways in which this risk is managed (Clarke et al. 2021 and Instiglio 2018). An example is the Nepal Employment Fund, which made full payment to training providers upon verification of employment (including entrepreneurship), with bonuses paid for trainees in certain disadvantaged categories. Over eight years, the Fund placed 90,000 beneficiaries in jobs, 53 percent of whom were

women and 80 percent considered disadvantaged. An impact evaluation found significant positive impacts on employment and earnings a year after receiving training (Chakravarty et al. 2019).

- **The verification process for results needs to be practical as well as credible**. This can be complex for TVET given the challenge of attribution for labor market outcomes. To address this issue, verification processes could be designed to change over time, with more rigorous methods such as impact evaluations being used in the earlier, experimental stages to establish credibility then moving to simpler approaches once the "true" impacts are better understood. Other approaches to reducing verification costs include using existing administrative data effectively, as was done for the Colombia Workforce Development Social Impact Bond (Instiglio 2019) or conditioning payment on shorter-term milestones, such as measuring employment outcomes four, rather than six months, after program completion, as the Skills and Knowledge for Youth program in Ethiopia did (NORRAG 2021).

Regular reviews of institutional and system practices and expenditures can identify opportunities for resource reallocation and support peer learning in both TVET and in education as a whole. TVET is more expensive to deliver than general education, for good and bad reasons (OECD 2021b; Agrawal 2013; Newhouse and Suryadarma 2011). In part, this is due to the possible high capital and operating expenses of equipment, which often needs to be brought up to date, and WBL costs, which can include the cost of partner firm staff as trainers as well as facility and equipment costs (Hoeckel 2008). However, there is also often evidence of resource misallocation, such as funding for fields of study for which labor demand is low, leaving too little for high-demand fields. Currently, TVET providers are not conducting regular institutional reviews and education systems are not regularly assessing the effectiveness and efficiency of their spending on TVET. Such reviews are quite different from formal accreditation processes, the purpose of which is quality assurance. The objective of the more informal expenditure and performance reviews is to obtain feedback on institutional and system effectiveness in order to identify where to prioritize reform efforts and facilitate sharing of good practices.

These reviews could also be used to capture and reward innovations, such as competitive grant schemes. For example, in the early 2000s, China carried out a competitive selection of model secondary and tertiary TVET institutions and provided them with additional financial and technical assistance and with policy and financial space in which to innovate (World Bank 2018b). In Nepal, the second phase of the Enhanced Vocational Education and Training (EVENT) Project is providing performance-based quality improvement grants to public and private institutions that meet baseline criteria (World Bank 2017b). Programs like the World Bank TAP, which evaluates provider practices in terms of nine institutional actions, can identify promising actions that can be shared with other institutions.

TVET systems should crowd-in private investment. By building up private contributions, public financing can be refocused to supporting equitable access to TVET, increasing enrollment in critical fields, and providing foundational and other transferable

skills that are underprovided by the market. Private financing can further infuse additional resources into TVET, often needed given the low public spending on it in L/MICs (less than 0.2% of GDP, compared to 0.46% for HICs). Private sector contributions can also strengthen accountability by giving the private sector more "skin in the game."

In attracting private financing, however, it is critical that these contributions do not become a tax on formal job creation. In 2020, there were 52 national training funds financed by a payroll levy of 0.05 to 4 percent at an average of 1.3 percent (UNESCO 2022). Training levies help diversify sources of TVET funding and make it more stable and predictable. But they also increase the cost of labor in the mostly large, formal firms that contribute, and can lead to segmentation and other distortions. Given the structure of labor markets and the challenge of creating high-quality, formal jobs in L/MICs, if employers perceive such levies as a tax they might become reluctant to create formal jobs (Packard et al 2019, Pages 2017, and OECD 2011). This risk is high in many L/MICs, where levy-paying employers often see little benefit to their contributions because they have little say in the governance of levy-financed funds and because often the funds are diverted to non-training expenditures. For example, in Benin, one of the two countries with the highest levy rate of 4%, less than 40% of the collected funds goes to the training fund, and then less than half of that amount is spent on training (UNESCO 2022).

In most L/MICs, moreover, training funds are used not only to finance training of the contributing firms' employees but also workers in the informal economy or non-contributing SMEs (UNESCO 2022). Training of these latter groups should be financed from general taxation, not only for efficiency considerations but also to ensure sufficient funding for training since the tax base for levies can be small in countries with a large informal economy. In Colombia, for example, the training fund moved from levy to general budget financing, and in Bangladesh the Human Resource Development Fund (HRDF) has been designed to allow for contributions from government, enterprises, and donors (ILO 2016). If there is cross-subsidization from private funds, it is important that it at least be explicit. The model in Madagascar may be useful elsewhere: the training fund has a dedicated "equity" window for training workers in the informal economy, financed not from the levy on formal firms but by contributions from development partners (UNESCO 2022). In countries with more fiscal resources, such a window could be financed from general taxation.

O. 3. 3.
The Third Transformation: From Decisions Based on Conjecture to Decisions Based on Evidence

With scarce data and a limited evidence base, the TVET system is largely operating in the dark, compared to other parts of the education system. For basic education, there is a burgeoning body of evidence on effective interventions, compiled, for example, by the What Works Clearinghouse in the United States, and more recently the What Works Hub for Global Education, launched in 2021 by the United Kingdom's Foreign, Commonwealth and Development Office to "use global

evidence and local data to prioritize reforms"[15] There is also increasing recognition in basic education that standardization of education data—not only on basic enrollment and completion but also on learning outcomes—is essential for identifying reform priorities and designing effective policy. Three major international organizations—UNESCO UIS, UNICEF, and the World Bank—have joined forces in the Learning Data Compact, which aims to ensure that all countries have at least one quality measure of learning by 2025.[16] Finally, as mentioned earlier, there are classroom observation tools that measure teaching practices, providing valuable insights into what really happens in the classroom, identifying good practices, and providing an evidence base for teacher professional development and coaching. There are no such equivalents for TVET. Despite several international initiatives, even basic enrollment and completion data are sometimes difficult to find, much less standardize, given the diversity of TVET programs at different levels, which may be governed by different ministries or agencies (Inter-Agency Working Group on TVET Indicators 2014). For example, data on participation in WBL are still not being collected in a standardized way by country, which hinders cross-country analysis of, e.g., formal apprenticeships and identification of examples to offer policymakers and practitioners of what could work in their own national context.

PRIORITY 6.

Reduce the information gaps of learners, enterprises, TVET providers, communities, and policymakers by collecting and publicizing detailed data on TVET returns, skills needs, and provider inputs and practices

Efforts should be intensified to provide timely and user-friendly information to different groups of TVET stakeholders to inform their decisions. Three types of evidence need to be collected to transform TVET systems from conjecture- to evidence-based: (1) information on returns to TVET that actual and prospective learners and employers can use to inform their choices; (2) information on skills demand, which TVET providers need to ensure their programs are relevant; (3) information about the inputs and practices of TVET institutions in order to prioritize reforms.

More systematic assessment of returns to TVET for different types of students and programs can reduce TVET stigma, empower both learners and employers, and improve decision-making. Data differentiating returns by field of study, TVET institutions, characteristics of individual learners, and returns over time are even more scarce, though it is vital to learners' educational and occupational aspirations, expectations, and decisions because such information can be used, e.g., to reduce misperceptions resulting from comparing returns from TVET and from general education, to attract more learners to priority occupations and fields of study, such as STEM, or to repair the negative image of TVET with employers when it can deliver quality training (UNDP 2019).

However, while collecting the data is vital, it is equally important that it be presented in a timely and accessible way. Useful sources of guidance are

15 See https://www.gov.uk/government/news/pm-unveils-new-aid-for-girls-education-to-prevent-pandemic-lost-generation.

16 See https://www.unicef.org/partnerships/learning-data-compact.

labor market observatories, institutions that help guide students, job seekers, policymakers, training institutions, labor market intermediaries, and employers on labor market trends (Rutkowski et al. 2018). Colombia, Chile, and Peru, for example, disclose this information at the tertiary level in ways that make it easy to compare programs in both TVET and general education.[17] Labor market observatories conduct tracer studies, which track graduates' labor market outcomes. Given the prevalence of self-employment and informality in many L/MICs, simply relying on administrative data, such as social security databases, to understand employment trajectories of graduates is far from sufficient. It is therefore important to collect reliable contact information for students before they graduate, so phone or social media tracer studies can track their progress (ETF-CEDEFOP-ILO 2016).

For TVET providers, current and historical information on the nature of jobs and skills content by occupation and industry and quantitative and qualitative forecasts can help align their offerings with the skills in demand. In a context of rapidly changing labor markets, including due to the green transition, providers are expected to understand these trends in order to support the school-to-work transition and respond to the technical skills needs of the economy. Most efforts should focus on the short and medium terms, about five years, given how difficult it is for employers to predict skills and occupational needs even five years from now. Surveys of formal employers should be complemented by an assessment of skills needs in the informal sector. Less costly ways to obtain market feedback should also be considered, such as regular formal and informal but structured consultations with enterprises and partnerships with private job search and matching services. For example, in Moldova in 2017 structured workshops and consultations were carried out with representatives of six sectors to identify skills demand and other issues (IFC 2017). Technology and big data can be helpful, though mostly for high- and middle-skilled occupations in the formal sector. Real-time labor market monitoring using vacancy data, for example, has been very informative for measuring demand for some skills, such as digital and complementary skills in Malaysia (Cunningham et al. 2022). Partnerships with the private sector, e.g., job-matching or data analytics companies, can expand data collection and analysis possibilities. Like the information on returns, that on skills demand needs to be delivered to the learners, job seekers, and TVET providers in a way that is both accessible and timely (Rutkowski et al. 2018). Indonesia has begun investing in its labor market intelligence system and launched several initiatives to build a comprehensive understanding of skills supply and demand (Granata et al. 2021).

17 For Colombia, see: http://bi.mineducacion.gov.co:8380/eportal/web/men-observatorio-laboral/vinculacion-laboral-general; for Chile, https://www.mifuturo.cl/ ; and for Peru, https://www.ponteencarrera.pe/pec-portal-web/ .

PART 4
Achieving and Sustaining the Three Transformations

Information on institutional performance can help to benchmark TVET providers, identify good practices, and prioritize reform efforts. Most TVET systems in L/MICs lack information about the practices and performance of TVET providers from facilities, equipment, and funding to pedagogical approaches and management practices—and, as the popular phrase suggests, "only what gets measured, gets done." Even basic indicators tracked in theory by TVET education management information systems (EMIS) can be outdated, or not analyzed. Investing in state-of-the-art EMIS is therefore vital. So are tools, like the World Bank's TA), which can help providers learn where they stand on key performance dimensions relative to what is possible in their local context and learn about good practices from their peers in order to guide reform. Such programs can also be useful for policymakers to incentivize and reward reform efforts.

Strategic use of impact evaluations can complement systematic data collection and provide robust evidence on interventions that can deliver results. The potential impact of better evidence in TVET is enormous given the high degree of heterogeneity of impacts across individuals, programs, institutions, and systems. To date, although the number of TVET impact evaluations has been growing, they are still rare and they cover too few areas. As a result, the evidence base for some fundamental issues—such as which type of TVET programs, or even education track, works best for whom, or how best to incentivize providers and ensure quality and relevance—is uncomfortably thin. TVET institutions and programs are very rarely evaluated systematically, and where assessments are conducted, as for accreditation, they are almost never used to promote learning and create an evidence base for reforms. When used strategically, rigorous impact evaluations can complement other types of assessments—such as process evaluations—to help identify what is working and what is not, thereby supporting and sustaining change in TVET and fostering learning between and within countries.

Pursuit of the three TVET transformations requires both commitment and pragmatism. Transforming TVET systems in L/MICs will require strong leadership and clear vision, as well as significant and sustained effort. Still, there are reasons to be optimistic that the efforts will pay off by drawing on lessons from earlier experiences and leveraging new data and technologies.

There is no uniform recipe for TVET reform; each country has to specify its priorities and the sequencing for reforms based on a vision that balances critical trade-offs. Stakeholders see TVET as a vehicle to help countries, firms, and individuals achieve a variety of goals. However, prioritizing one goal may make it harder to achieve others, either because there are inherent trade-offs or simply because financial and other resources are limited.

Policymakers and the main stakeholders need to answer three fundamental questions to draw up a shared vision of the role that TVET should play in addressing the various needs of its two main clients: learners and enterprises.

- ***First:*** How should TVET systems balance the need to provide youths with skills relevant for today's labor market and their need to be able to adapt as skills needs evolve? While some policies, such as prioritizing foundational skills and mapping flexible pathways between general and vocational education, can serve both needs, the answer to this question has implications related to, e.g., optimal time for entering TVET, the share of TVET curricula devoted to transversal skills, the balance between initial and continuing TVET, and the amount of investment in both skills anticipation and in technology and equipment.

- ***Second:*** with limited resources and capacities, how can countries balance the expectations for TVET to serve the needs of catalyzing high-productivity sectors while at the same time supporting inclusion? The answer to this question will have implications for the size of the TVET system, the skills and programs it focuses on, priorities for public financing, and the need to leverage links to non-formal TVET.

- ***Third:*** how much should countries that lag in economic reforms and economic transformation invest in TVET, particularly after secondary education? The response may affect the total size of the TVET system, the relative investment in secondary versus tertiary TVET, and reliance on partnerships with large firms to support reform efforts. Responding to each question will require a realistic assessment of the local labor market and of resource constraints, the expected effect of global mega-trends on TVET, and a consensus-building process among the diverse stakeholders in the TVET ecosystem. Finally, it is critical to consider how far along the country is in its economic transformation and the process of economic reforms that generate payoffs to TVET investment.

The time is right for L/MICs to embark on strategic TVET reform by taking advantage of opportunities to leapfrog in their reform efforts. (1) There is significant scope to learn from global practices and the evidence on what works—policy learning rather than policy borrowing in recognition of how much L/MICs can differ. This evidence base, though still small and insufficient in many areas, is growing. Regional and global knowledge sharing through dedicated forums and instruments like the Association of Southeast Asian Nations TVET Council; the BRICS Technical and Vocational Education and Training Cooperation Alliance; and the European Training Foundation's Torino Process, for example, tries to harness this potential. (2) While a limited evidence base is a significant weakness in most TVET systems, in designing reforms there are already tools that can be used or adapted to be more evidence-based. (3) Technology—if accompanied by the necessary complementary investments— has the potential to transform TVET in L/MICs, from design and development of courses, through program delivery, student services, and recognition of prior learning to governance, labor market information systems, accreditation, and quality assurance (World Bank 2021; ILO and UNESCO 2020). Finally, the pandemic accelerated the development of digital learning models in TVET, bringing with it both opportunities and recognition of all the constraints that must be overcome for these innovations to reach full potential and contribute to the system's resilience to future disruptions (ILO, UNESCO and WBG 2020).

There are many quick wins that can demonstrate the benefits of TVET reform and help ignite more fundamental changes. While the three transformations may require significant investment and time, countries can start reforming with a strategic approach to priority sectors and programs that would deliver quicker results and can be used as demonstration cases to build stakeholder confidence and trust. Countries can also give priority to market-driven mechanisms of short-route accountability that can improve quality and relevance relatively quickly while capacity is being built for enhanced formal quality assurance.

Beyond specific successful programs and quick wins, systemic reform is possible with time and sustained investment. Sustained reform efforts in the latter half of the 20th century in Singapore, South Korea, and to some extent Malaysia provide a useful guide. Their TVET systems today have many of the stakeholder interactions and foundations that are associated with strong performance. In South Korea, for example, policymakers have access to comprehensive and up-to-date information from the Labor Market Information System, such as Work-net, HRD-net, and Employment Insurance Network, to inform policy design (KRIVET 2007). In 2010 Korea introduced a high-profile initiative of "Meister" high schools to address critical skill needs in priority sectors. The country has many good examples of established collaboration between industry and training providers, such as the partnership between Samsung and the Korea University of Technology and Education (World Bank 2013), and agreements between the government and organizations such as the Korea Institute of Industrial Technology and the Korea Master Society to secure "Meister teachers" who work within local industries. Similarly, in Malaysia, the Penang Skills Development Center, an industry-led skills training and education center, is an example of what many countries aspire to.

What is often missed, however, is the journey these East Asian economies embarked on to reform TVET and link the reforms to their general economic and development transformations. It took current high performers decades of persistent and comprehensive reforms to improve the structural foundations of their TVET systems, usually as part of an agenda that emphasized basic skills in general education. Singapore also offers a clear example of the role of consistent leadership in shaping the skills agenda and the substantial investments necessary to expand and improve TVET performance (Commission on Growth and Development 2010). More recent reform experiences in other L/MICs, such as Bangladesh, El Salvador, and Mongolia, which we already discussed, also provide valuable insights.

The three transformations are primarily about creating mechanisms through which reforms can be sparked and sustained to deliver on TVET's promise to support employment and productivity for sustainable economic transformation. As in other policy areas, the main impediment to reform in TVET is often not the lack of technical knowledge on what to do, but rather addressing the political economy of reform. As we have outlined above and detail in the report, despite TVET's mixed track record in L/MICs, promising models and practices exist. Achieving sustained progress in TVET at the system level, however, is likely to take time, and the path may entail overcoming policy reversals, like the one experienced in Mongolia (MCC 2020).

Kickstarting and sustaining reforms requires reshaping the policy arena by changing who can participate in decision-making, transforming incentives to pursue goals, and aligning shareholder preferences and beliefs (World Bank 2017c). Moving gradually toward excellence, focusing on end results, and making decisions based on evidence at the program, institutional, and system levels more deliberately can reshape the TVET policy arena in L/MICs. That will bring TVET closer to more equitably and sustainably meeting its promise of enhancing employability and contributing to employment and productivity.

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PART

1

THE TVET PROMISE

Most workers in low- and middle-income countries (L/MICs) have low-productivity jobs, often in the informal sector, and most countries still struggle to deliver on their goals of skills development. Uncovering how formal technical and vocational education and training (TVET) can effectively facilitate the school-to-work transition for labor market entrants and continue to meet the skills demands of employers thereafter is a policy priority for L/MICs.

The challenge is complicated by the megatrends and economic transitions associated with the COVID-19 recovery, globalization, technological progress, demographic shifts, and climate change. Although these forces can be disruptive, they can also open up opportunities for L/MICs to leapfrog obstacles in formal TVET systems. While the pandemic exposed substantial vulnerabilities in TVET, in the short-term better systems can make possible agile and cost-effective responses to crisis-induced shifts while meeting the evolving demands of employers and societies for skills. Although most TVET in L/MICs replicates aspects of TVET in high-income countries (HICs), there are significant differences in context, capacity, and how TVET is designed and functions—which implies there is value in reflecting on how the specific TVET challenges in L/MICs can be addressed.

Because well-functioning TVET enhances the employability of graduates, it can contribute to higher employment and productivity, as well as to broader sustainability outcomes. If TVET is to achieve these objectives, it must perform well on four critical dimensions:

access, equity, quality, and relevance. Although these dimensions are likely universal, how best to surmount specific obstacles to achieving them will vary by country. In addition, resource scarcity, the increasing frequency of idiosyncratic and aggregate shocks, and megatrends like climate change require constant attention across the board to what will best promote efficiency and sustainability in TVET. The individual and collective actions of the many TVET stakeholders—learners, enterprises, TVET institutions, governments, and social partners—shape how well TVET can improve on its performance and eventually, achieve its promise.

Given the potential for coordination failures, interactions with stakeholders are likely to be particularly complex in L/MICs. Underpinning TVET's performance and the extent to which stakeholders interact effectively to deliver TVET are three foundations: (1) a shared vision and strategic framework ("plans"); (2) governance arrangements ("tools"); and (3) funding and expenditure mechanisms ("funds").

This part consists of two chapters. The first chapter discusses the current context for TVET in L/MICs, particularly given development challenges, labor markets in these countries, and continuing shifts in the world of work globally. The chapter also sets out the objectives and structure of this report. The second chapter develops a conceptual framework to better understand the challenges of current TVET systems in L/MICs discussed in Part 2 and helps identify policy priorities and options elaborated in

CHAPTER 1.

Achieving the TVET Promise in Low- and Middle-Income Countries

SECTION 1.1.

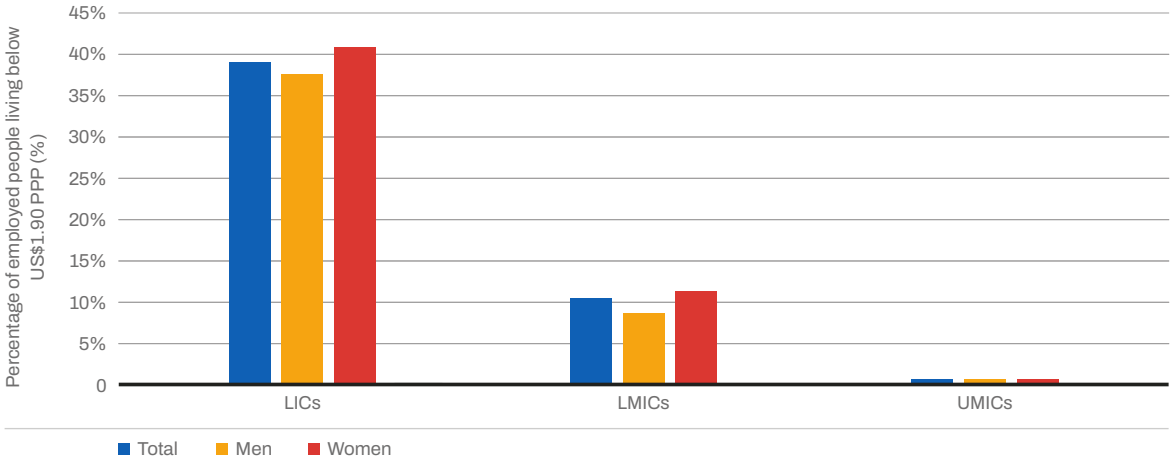
Contributing to Employment and Productivity for Sustainable Development

Supporting Employment, Productivity, and Sustainability Goals

Expanding inclusive economic opportunities and increasing productivity sustainably are top policy priorities in low- and middle-income countries.[3] Too many people are out of work, and when they do work, they usually have low-productivity jobs with poor working conditions and no access to social protection. Common characteristics of labor markets in many low-income and middle-income countries (LICs and MICs, or L/MICs) are high informality, large shares of workers who are self-employed or earn low wages in small and micro firms, and large wage disparities (Merotto et al. 2018). Partly as a result, particularly in low-income countries (LICs), employment often coexists with poverty with almost 40 percent of people with jobs living below the poverty line of US$1.90 (Figure 1.1). Women and youth tend to be disproportionately disadvantaged (ILO 2022a). Indeed, over 20 percent of youth in L/MICs are not in education, employment, or training, as are almost 40 percent of young women in L/MICs (Figure 1.2). Despite some progress, in many L/MICs female labor force participation remains remarkably low (Merotto et al. 2018; World Bank 2012). Women are also more likely to have vulnerable, low-paid jobs.

3 According to the World Bank country-group classification, in 2022 there were 27 low-income countries, 55 lower-middle-income countries, and 55 upper-middle-income countries; see Appendix A.

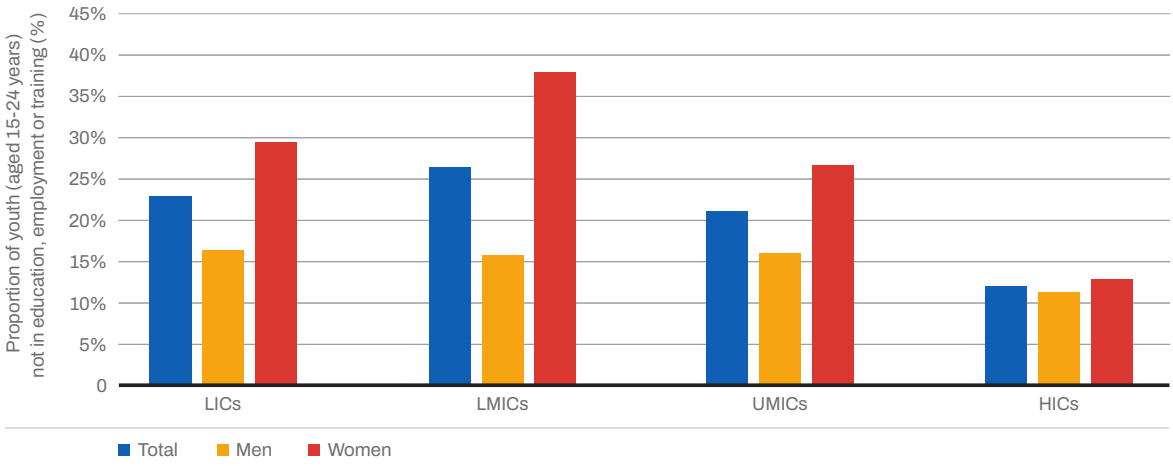
Figure 1.1: As Many as 40 Percent of Workers Live in Poverty in LICs



Source: ILOSTAT data in Purchasing Power Parity (PPP) terms; authors' calculations. Year = 2019.

Note: Average values for HICs tend to zero. LICs = Low-income countries, LMICs = Lower-middle-income countries, UMICs = Upper-middle-income countries.

Figure 1.2: Many Youth, particularly Women, Are Not in Education, Employment, or Training (NEET)



Source: ILOSTAT data and authors' calculations. Year = 2020.

Note: LICs = Low-income countries, LMICs = Lower-middle-income countries, UMICs = Upper-middle-income countries, HICs = High income countries.

Equipping workers with more and better skills can help prepare current and future workers for productive jobs and entrepreneurship, to the benefit of the entire economy and society. Skills are human capital, which helps people realize their potential for being productive and active citizens. Skills, foundational (or core, transversal), cognitive and socioemotional, occupational, job-specific, technical, and digital, can increase the chances of productive employment in L/MICs. Better-educated individuals are on average more likely to be employed and to earn more (Patrinos and Psacharopoulos 2020). In addition to the benefits that accrue to individuals, the accumulation of skills in the workforce can facilitate the shifting of work and economic activity from less to more productive uses within and between sectors, and thus contribute to the structural transformation and inclusive economic growth

for the entire country (ILO 2021b; don't split names and Shimeles 2019; Martins 2019; Karachiwalla and Palloni 2019; Herrendorf and Schoellman 2018; Flabbi and Gatti 2018). The provision of skills through TVET can also help make the growth and gains from economic transformation more equitable, for instance, by expanding labor market opportunities for women (World Bank 2018; ILO and WTO 2017). Moreover, investment in a skilled workforce can spark a virtuous cycle where quality skills enable productivity growth that results in more and better jobs for the current workforce; in turn, this generates further public and private investments in education and training and can ultimately support the sustainable development of economies and societies—a benefit for future as well as current generations.

With its unique focus on workforce development, TVET can make a critical contribution to enhancing the employability of youth and adults and addressing skills constraints. TVET is understood as skills development in a wide range of occupational fields, production, services, and livelihoods; it can occur at secondary, post-secondary, or tertiary level and includes work-based learning (WBL) and continuing training and professional development that may lead to professional qualifications (UNESCO 2015a). The focus on technical and occupation-specific skills immediately pertinent to the world of work means that a well-functioning TVET system can be an important factor in efforts to facilitate school-to-work and labor market transitions.

Well-designed TVET programs can thus help countries meet the Sustainable Development Goals (SDGs) of "ensuring inclusive and equitable quality education and lifelong learning opportunities for all" and "promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (OECD 2019 and UNESCO 2016).

Moreover, given the importance of TVET for a range of industries, quality TVET is likely to be essential to fostering firm-level and aggregate productivity, including in services (Almeida et al. 2012; Ansu and Tan 2012; Ashton et al. 2002; Kuruvilla et al. 2002). In Côte d'Ivoire, for example, a subsidized dual apprenticeship program increased both the earnings of the apprentices and the marginal profits of the firms (Crépon and Premand 2019).

While there are not many studies like this in either advanced economies or L/MICs, there is a considerable amount of indirect evidence that skills building and productivity are linked. Evidence from the World Bank's Skills Towards Employment and Productivity (STEP) employer surveys in six countries (Armenia, Azerbaijan, Georgia, Sri Lanka, Vietnam, and Yunnan province in China) shows that for both blue- and white-collar workers employers prioritize technical skills in retention decisions (Sanchez Puerta et al. 2016). ILO's Labor Demand Enterprise Surveys, carried out in eight countries (Benin, Liberia, Malawi, Nepal, Tanzania, Tunisia, Vietnam, and Zambia), demonstrate the value of technical skills in hiring decisions; in four Sub-Saharan African countries (Benin, Liberia, Malawi, and Zambia), more than 60 percent of firms agreed that technical skills are either very or extremely important. Indeed, these skills are considered the most important among the seven possible skills (Arias et al. 2019, based on ILO School-to-Work Transition Surveys). At the same time,

shortages of technical and vocational skills are often reported. For example, employers in Moldova cited technical skills as one of the top three skills-related obstacles to firm performance (Rutkowski and Levin 2017). These technical skills, which are the focus of TVET programs (MCC 2020), have in turn been associated with heightened productivity for workers, firms, and the economy (Cima et al. 2022; Criscuolo et al. 2021, ADB 2015, and CEDEFOP 2011). For example, in India, workers' productivity increased by 6–7% after employers provided skills training (Middleton et al. 1993). As we discuss in Part 2, TVET can also lead to higher earnings, at least in some contexts, suggesting that it can increase productivity.[4]

By providing critical technical and vocational skills relatively swiftly, TVET can help address skills shortages and mismatches in the short term as well as shape the types of jobs that are created and a country's path of sustainable economic transformation in the medium and longer terms. Because it emphasizes building work-relevant skills, TVET is well-placed to promote alignment of workforce skills with current labor market demand, as happened in some areas, for example, during the COVID-19 pandemic (ILO et al. 2021). And TVET can also have a significant impact on longer-term development trajectories, including through its impact on innovation. employers and investments, especially foreign direct investment. For example, the availability of middle-skilled and bilingual workers was central to Intel's selection of Costa Rica for a factory site; this opportunity allowed the country to generate more and better jobs and eventually move up the global value chain into higher value-added activities (Monge-González 2017).

The ambitions governments worldwide have for TVET were shaped by the centrality of TVET in the economic transformation of East Asian economies in the 20th century, when manufacturing took off and their exports became increasingly sophisticated (Tilak 2001 and Siddiqui and Rehman 2017), and in the economic model of advanced economies like Austria and Germany. Green skills are recognized as important to align the capacities of individuals with a systemic change toward sustainability (UNESCO 2022b). The transition to zero-emission economies will have an impact on technologies and production and will heighten demand for workers with skills for greener jobs, such as those relevant to clean energy and clean transport. This transition will require new skills that TVET can offer and that youth will be interested in obtaining (UNESCO-UNEVOC 2017a; IAG TVET 2012).

Beyond its labor market impacts, TVET is often seen as advancing other societal objectives, such as inclusion, social cohesion, and gender equality, or crisis preparedness and response. Like other education and training subsectors, TVET can help generate trust, boost social capital, and create institutions that promote inclusion and shared prosperity (World Bank 2018). Rightly or wrongly, TVET is often considered a desirable route for the millions of L/MIC youths who lack the foundational skills (also called core skills, as in ILO 2021a), the means, or the interest to pursue general education. TVET is then expected to help these students to achieve their aspirations, reduce social

4 See, for example, World Bank (2018) for a detailed discussion on whether returns to education reflect a boost to human capital and productivity or simple signaling. The report convincingly concludes it is the former.

and gender inequalities, promote social mobility, and support lifelong learning (UNESCO 2018b). A well-functioning TVET system is also expected to make a major contribution to crisis preparedness and response, as happened during the pandemic.

Policymakers in L/MICs realize how much TVET can do to forward the skills and jobs agenda. A recent survey of senior government officials working on education in 35 L/MICs found that many prioritize vocational education even over foundational learning.[5] In fact, when asked to choose between two hypothetical education projects, policymakers preferred TVET over projects focused on either foundational literacy, assessment, construction, or information technology. Moreover, of 21 different reforms, TVET reforms were the fourth-most frequently cited as the most important reforms over the past five years after curriculum, free universal education, and sector plans. This points to significant L/MIC ownership for TVET reforms and demonstrates the demand for additional support for this agenda.

A Promise Yet To Be Fulfilled

Most L/MICs struggle to deliver on the promise of workforce development for many reasons, as we discuss below, and not all originate in the TVET system. Many L/MIC students entering TVET may not have the necessary foundational skills to succeed; for example, in Cambodia, Senegal, and Zambia, less than 10% of 15-year-olds have the minimum level of proficiency in reading (OECD 2019a). And, as this report documents, there is a huge variation in the returns to TVET for graduates in terms of fields of study, institutions, and over time. Not surprisingly, then, despite the promise, shortages of skills, notably technical skills, are often a drag on economic activity. On average, a third to more than half of employers report that a lack of skilled workers is a severe bottleneck for their operations, particularly as firms become larger and, usually, more productive (Figure 1.3). Employer surveys in such countries as Bangladesh (World Bank 2015), Kenya (World Bank 2015), and Sudan (World Bank 2017) highlight skills gaps among TVET graduates.

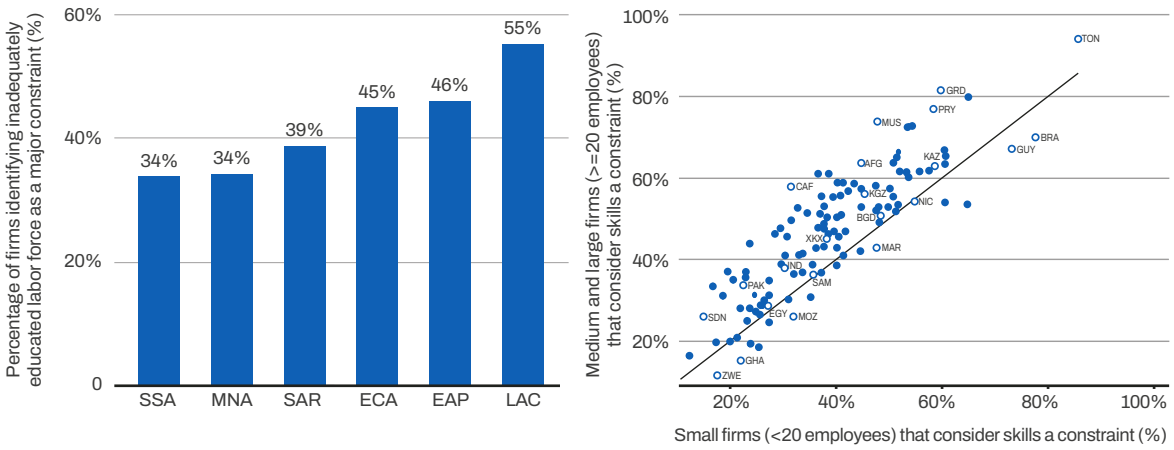
Fundamental questions are thus: How can TVET systems in L/MICs more effectively facilitate the school-to-work transition for labor market entrants? support lifelong learning for all workers? meet the skills demands of employers? and encourage the sustainable development of the national economy? As in other policy areas, there is a fundamental question of whether TVET systems are fit for purpose; and if not, what can be done to improve their capacity to contribute to national employment and productivity objectives while supporting efficiency and sustainability. This requires considering the specifics of each L/MIC labor market as well as the continual changes affecting the world of work and education and training systems as L/MICs continue to undergo economic transformations and navigate evolving needs and opportunities related to globalization, technological progress, demographic shifts, and climate change.

5 Crawfurd et al. 2021. However, one reason for the marked preference of policymakers for TVET over foundational learning may in part be that they have underestimated foundational learning gaps in their countries.

Figure 1.3: Skills Can Be a Constraint to Employment and Productivity in L/MICs

A) Numerous employers in L/MICs identify an inadequately educated workforce as a major constraint.

B) Medium and large firms are more likely than smaller firms to consider an inadequately educated workforce as a major constraint.



Source: World Bank Enterprise Surveys.

Note: Dots in B represent countries. The indicator measures the share of firms that rate skills (1 = not important to 5 = important) above the average rating that the same firm gives to all the constraints surveyed. EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa. See Appendix Table A.1 for country codes.

SECTION 1.2.
Labor Markets and Education and Training Systems in L/MICs

How L/MIC and HIC TVET Systems and Labor Markets Differ

In every country, the TVET system is shaped by historical and structural factors that affect how labor markets function and the demand for education and training. The economic context within which TVET operates is particularly important, because TVET emphasizes preparing students for the labor market. Beyond general competitiveness and a country's economic structure, relevant factors include the extent to which employers consider skills constraints a serious impediment to their operations; the relative size of the formal economy; employment and economic activity by firm size; the extent to which there are institutions that credibly represent the private sector; the relative importance of the public sector as an employer; community and parental perceptions and social standing of TVET compared with other forms of education and training; and the degree of trust between the private sector, the government, and TVET providers (CEDEFOP 2020; Fawcett et al. 2014; De Moura Castro 2008; African Union 2007).

In all these areas, there are substantial differences between L/MICs and HICs, making it inadvisable for the former to replicate the TVET policies and institutions of the latter. Yet, as this report finds, too often replication still occurs, and not enough attention is paid to a country's specific characteristics. Compared to HICs, L/MICs have relatively little TVET funding and institutional capacity, and the formal sector and large firms are relatively rare. For example, about two-thirds of the workers in L/MICs are employed informally; even among newly created jobs in Sub-Saharan Africa, the majority are informal (World Bank 2019; UNESCO 2015b). Economic structures and the sectoral and occupational patterns of employment are also different: in HICs, middle- and high-skilled outnumber low-skilled workers, while in regions like Sub-Saharan Africa the reverse is true (Chakroun 2019; Adams et al. 2013). Finally, significant differences in basic education enrollment, completion rates, and quality directly shape TVET systems and their outcomes (World Bank 2018).

As a result of these factors, TVET systems can look very different. In some countries, Guatemala for one, almost all upper-secondary students are in TVET; however, in Oman, Tanzania, and many other countries, there are almost no upper-secondary TVET learners. On average, in HICs 12 percent of 15–24-year-olds are enrolled in vocational education, but in LICs only 1 percent are. In one-third of L/MICs, TVET still starts in lower-secondary, but in most HICs learners enter TVET much later. In L/MICs, formal TVET is an important but often only a small part of a TVET system in which informal and nonformal programs predominate, such as informal apprenticeships; in contrast, most TVET in HICs is formal. Among other differences may be how pathways into and out of TVET are structured; whether public or private TVET provision and funding are more common; and the scope and nature of employer engagement in program design and delivery.

The differences in context between L/MICs and HICs suggest that there is value in reflecting on how to address the specific challenges for TVET in the former. Even though L/MICs can differ considerably, most are similar enough that useful lessons can be drawn from their reform experiences. Supporting such South-South learning is one goal of this report.

SECTION 1.3.
TVET in a Rapidly Evolving Landscape

Implications of Megatrends for TVET in L/MICs

Megatrends associated with globalization, technological progress, demographic shifts, and climate change are transforming labor markets globally. They can disrupt entire economies and societies, impacting daily life for everyone and changing the skills needed to succeed at work (UNESCO 2021; World Bank 2019; Arias et al. 2019; OECD 2019) For L/MICs, globalization emphasizes the importance of productivity increases if countries are to integrate into ever-more-competitive global value chains.

Rapid technological change is putting a premium on higher-order cognitive and socioemotional skills that complement new technologies (Table 1.1), especially critical thinking, communication, teamwork, adaptability, and knowing how to learn. Some of these changes in skill demands arise within existing occupations but others arise from shifts in the composition of employment, requiring the ability to navigate the world of work and move between occupations and economic sectors (UNESCO 2015b). Meanwhile, many L/MICs are still struggling to ensure that all students acquire the foundational skills that are critical for employment and productivity and are also prerequisites for responding to changing needs. Demographic shifts compound the challenge. While relatively young countries are looking to benefit from a demographic dividend, others are rapidly aging. In all countries, supporting lifelong learning will become increasingly important. Urbanization, along with migration, is associated with higher population densities in cities as well as sectoral shifts away from agriculture (Merotto et al. 2018), again changing the skills demanded and the context in which TVET is provided. Finally, the transition to a lower-carbon economy that needs to take place globally will affect what gets produced, and how that will happen is only now beginning to be understood—though it is likely to evolve rapidly in coming decades (UNCTAD 2021; World Bank 2014; Fulco et al. 2007).

Table 1.1: The Changing World of Work Requires a Mix of Technical, Higher-Order Cognitive, Socioemotional, and Digital Skills: A Technical Field Example

Industry Skills Needs for the Global Machinery Industry (based on Skills Added byLinkedIn Members in 2019)

1	Negotiation	6	Manufacturing Operations
2	Machining	7	Teamwork
3	Digital Literacy	8	Architecture
4	Maintenance & Repair	9	Business Management
5	Leadership	10	Project Management

Source: World Bank-LinkedIn database.

Note: The Industry Skills Needs metric captures which skills are most likely to be added to a member's profile in one industry than in other industries.

While changing skills demands are an added challenge for TVET systems, the megatrends also offer opportunities for L/MICs to improve TVET more efficiently. Globalization can raise the return on investments in skills, and regional integration in education and training can generate economies of scale and allow for specialization in the supply of training while widening the range of choices for learners (Arias et al. 2019). Technology-enabled tools, such as online or hybrid courses and simulations, are also changing what is possible by allowing more flexible and efficient delivery of education and training (World Bank 2021). Appropriately managed, urbanization and migration can contribute to thriving agglomeration economies that drive economic growth and raise returns on skills investments; these megatrends can lower the costs of providing education and training due to economies of scale; they can also provide expanded and more diverse education and training due to higher urban demand.

SECTION 1.4.
The Urgency of TVET Reforms in L/MICs

TVET Reforms Are Needed but Expectations Need to Be Adequate

To heighten what TVET can contribute to meeting a country's employment, productivity, and sustainability goals and help address the challenges and harness the opportunities inherent in the megatrends, in many L/MICs there is renewed interest in reforming TVET. SDG Goal 4 outlines what the education and training systems need to deliver if they are to meet sustainable development and labor market demands, such as targets for expanded and equitable access to quality TVET and greater acquisition of relevant skills by youth and adults (UNESCO-UNEVOC 2020). It is widely recognized, however, that achieving these targets will require significant TVET reforms (Arias et al. 2019; UNESCO 2016). The recent Transforming Education Summit, called by the United Nations Secretary General, which emphasized skills for work and life and recovery from COVID-19, recognized the importance of a transformed investment in skills in all countries but especially L/MICs (UNESCO 2022a). Given the central role of TVET in preparing learners for the world of work, this call for transforming TVET is very timely.

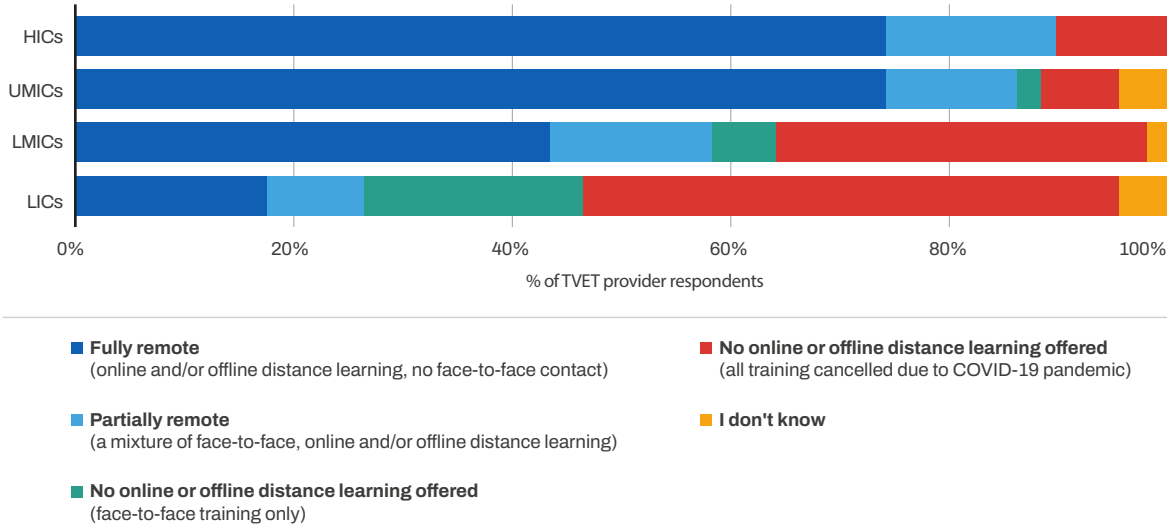
Calls for reform, however, often come with unrealistic expectations. In L/MICs, whether TVET can achieve its objectives depends heavily on the rest of the education system, especially the quantity and quality of early childhood, preschool, and primary education. These are all areas where in many countries there are still significant gaps that especially impact the most vulnerable. Moreover, equipping learners with skills relevant to the labor market is not a unique task of TVET systems: tertiary education and nonformal and informal training of youth and adults are also crucial to promoting employment, productivity, and sustainability across the lifecycle. Finally, it is important to remember that even a perfect education system does not guarantee better labor market outcomes, which depend on labor demand and the availability and quality of the jobs on offer (World Bank 2013; World Bank 2018). As much as this context matters, it is often underappreciated, leading to unrealistic and unmet expectations for TVET—which then contributes to a narrative of failing TVET systems that can become self-fulfilling as perceptions shape the decisions of individuals, families, teachers, providers, employers, and policymakers.

COVID-19 Intensified the Urgency of, and the Opportunity for, TVET Reforms

The pandemic exposed substantial vulnerabilities in the provision of TVET in L/MICs. In an ILO-UNESCO-WB survey (ILO et al. 2021) conducted early in the pandemic, TVET providers in 92 developing countries reported already offering distance learning, online and offline. However, the differences between countries in the ability to switch from in-person to remote instruction demonstrated the extent of the digital divide: while more than 70 percent of HICs and UMICs switched to fully remote modes, less than 20 percent of TVET providers in LICs were able to do so (Figure 1.4). Moreover, the widespread use of solutions that rely on good internet connectivity and access to "smart" digital devices

likely disrupted learning for a disproportionate share of vulnerable TVET students (ILO et al. 2021). The provision and assessment of practical skills training, the signature feature of TVET, was particularly challenging when training centers were closed and the focus shifted to preserving learning continuity through theoretical coursework. Work-based learning opportunities were also widely affected by the closure of enterprises during COVID-19-induced lockdowns (ILO et al. 2021).

Figure 1.4: The Move to Remote Learning During the COVID-19 Pandemic Was Not Possible in Many L/MICs and LICs



Source: ILO et al. 2021.

Note: LICs = Low-income countries, LMICs = Lower-middle-income countries, UMICs = Upper-middle-income countries, HICs = High-income countries. Period April-May 2020.

More effective TVET systems can be part of the answer to crisis-induced shifts in the supply of and demand for skills. COVID-19 containment measures and economic impact were uneven across economic sectors, with some sectors and occupations—often those for which TVET is prevalent, such as essential jobs in health care and logistics, becoming ever more critical. To help respond to the shock, TVET showed some flexibility during the crisis (Hoftijzer et al. 2020), for instance in terms of rapid response, shorter programs, and accelerated certifications (Box 1.1.). In Kazakhstan, short-term professional trainings were launched to address skills shortages and redeploy workers in support of the pandemic response. Similar efforts were carried out in other countries (Hoftijzer et al. 2020). The pandemic produced important lessons on how TVET can respond to shifts in skills demand accelerated by crises. TVET's focus on practical skills, and its potential for delivering short-term, targeted, and modular training can be harnessed to rapidly upskill and reskill workers in essential sectors and engage them in response to a crisis and its aftermath. Put simply: agile TVET systems can contribute to economic recovery from crises by delivering quality short-term training that is aligned with changing skills demands.

BOX 1.1.

TVET during Crises: Experiences during the Pandemic

The COVID-19 pandemic made evident how useful TVET can be in crises, even if its potential is not always realized. A survey, conducted by the ILO, UNESCO, and the World Bank in April and May 2020, was administered to more than 1,300 respondents in 126 countries; most were TVET providers, but some were policymakers and social partners (ILO, UNESCO and World Bank 2021). The survey found that TVET contributed in four major ways to managing the crisis:

1. Creating innovative training programs and expanding existing courses for essential workers:

TVET systems—from, e.g., China, Ecuador, and India to Indonesia, Nepal, Trinidad & Tobago, and Vietnam—were essential in structuring new courses, mostly online, to train workers or volunteers to support health care professionals; raise awareness about protective and preventive measures, health and safety regulations, hygiene, and infection control; and generate trained workers to produce, repair, and maintain medical equipment and provide care. Similarly, TVET systems were also called upon to help reduce shortages in other industries essential for crisis response. Moldova, Sri Lanka, and many other countries reported tackling COVID-19-related shortages of workers in ICT and related services; Indonesia was among the countries training workers to produce personal protective equipment and operators for health support call centers.

2. Identifying new training materials and resources, both online and offline, and adapting existing learning materials for online use:

Many respondents reported identifying resources and providing access to learning materials on topics like production and handling of medical equipment (Malaysia), medical treatment (Vietnam), staff and patient guidelines in medical facilities (Sri Lanka), production of masks and protective kits (Lebanon), mental health support (Honduras and Lebanon), and guidance materials for patients with chronic diseases and the health facilities treating them (Ecuador). A wide variety of training resources were brought into being, among them videos and multimedia materials, manuals, WhatsApp support groups, web resources, work platforms, call centers, simulators, and virtual reality tools.

3. Reorienting training centers to production of protective equipment:

The survey identified cases where training facilities had been redeployed to produce protective equipment for medical workers, such as face masks, shields, and protective clothing, medical machinery, ventilators and respirators, trolleys, hand sanitizers, and cleaning equipment. For instance, Colombia, Republic of Congo, Sri Lanka, Malaysia, Myanmar, and Nigeria all took advantage of the facilities for practical training that are often present in TVET centers.

4. Supporting deployment of workers (including migrant workers and refugees) to sectors in need through fast-tracking licenses and the formal and informal recognition of skills:

Faced with the COVID-19 emergency, public authorities mobilized their skills recognition systems to quickly deploy workers to where they were most needed. A review of policy measures taken by 10 Latin American and Caribbean countries in 2020 found that all now had policies in place to expand the healthcare workforce through, e.g., retraining, early graduation of medical students, or facilitating certification of trained healthcare workers (Allin et al. 2020). In Peru, students supported the frontline areas of the health sector by making telephone calls. In Indonesia, specific training was provided to medical equipment technicians, other healthcare workers, garment factory workers, and call center workers (Hoftijzer et al. 2020). Similar technical training and deployment of workers took place in Ethiopia, Eswatini, Kenya, and Somalia to address shortages in social workers to manage gender-based violence, children's rights violations, and mental health needs resulting from COVID-19.[a]

[a] https://www.unicef.org/esa/stories/advocacy-and-innovation-social-service-provision-eastern-and-southern-africa

The COVID-19 pandemic demonstrated how urgent it is for countries to reform their TVET activities to give agile and cost-effective responses to both short- and long-term skills needs. In addition to its direct impacts, the pandemic has likely expedited work automation, especially in UMICs and for occupations requiring mid-level skills (Chernoff and Warman 2020). This may polarize labor markets as demands rise for low and high skills but fall for mid-level skills—a situation already documented in more advanced economies and to a lesser extent in some MICs (World Bank 2019; Arias et al. 2019; and IADB 2019). This is a problem because even in advanced economies a large share of non-tertiary TVET graduates possess mid-level skills (OECD 2020). There is evidence that economic shocks like the pandemic that put people out of work for a while can lead them to accept lower-quality, lower-paid, and lower-skill jobs that affect their future employment trajectories and have long-term scarring effects (ILO 2021a).

SECTION 1.5.
This Report

Reforming TVET is difficult but can pay off. It is hard to get TVET right but returns to comprehensive reforms can be significant. In Mongolia, for instance, a broad-based reform package increased the earnings of female graduates by 13 percent; that is higher than the global average private return to one year of education (Patrinos and Psacharopoulos 2020; Field et al. 2019). L/MIC governments are trying to respond to the call for TVET reforms but in practice have often found it difficult to improve access, equity, quality, and relevance while keeping in mind the need for efficiency and sustainability. It is past time to look at the current state of TVET in L/MICs globally, learn from recent experiences and evidence, and reflect on how evolving megatrends are likely to affect future demands for TVET and how it functions.

The main goal of this report is to inform the design and implementation of L/MIC reforms to improve the performance of formal TVET. The report reviews the challenges facing TVET systems and L/MIC reform experiences to understand TVET successes and failures and point out current knowledge gaps. In particular, the report seeks to capture lessons learned from the many L/MIC TVET reforms in recent years and provide guidance to policymakers based on core principles and practical considerations specific to L/MICs. The report also aims to inform the decisions of other stakeholders with responsibilities for TVET performance, such as industry and development partners.

Although recognizing that TVET can also be nonformal or informal (Figure 1.5 and Box 1.2.), the report focuses on secondary and post-secondary nontertiary formal TVET, i.e. **leading to diplomas, degrees, or other formal certifications**. Specifically, the report looks at UNESCO's 2011 International Standard Classification of Education (ISCED) levels 25 (lower-secondary vocational education), 35 (upper-secondary vocational education), and 45 (post-secondary nontertiary vocational education). Although similar in the emphasis on practical training, post-secondary non-tertiary formal TVET is different from short-cycle tertiary programs (ISCED level

5), which are usually longer (at least two years) and have a broader focus (Ferreyra et al. 2021). Even when the level of education cannot be established precisely (as may be true of upskilling and reskilling programs), the main distinguishing feature is that programs considered in this report lead to formal certification.

Figure 1.5: There are Three Types of TVET

Formal TVET

- Secondary and post-secondary non-tertiary programs
- ISCED 2011 levels 25, 35, 45
- Leads to diplomas, degrees, or other formal certifications

Non-formal TVET

- Provided by institutions outside the formal system
- Large variety of programs with different course durations
- May lead to certification

Informal TVET

- Acquired within households or firms
- Learning-by-doing
- Typically skills acquired through work, may be specific or non-specific

Source: Adapted from Hanni 2019.

Note: International Standard Classification of Education (ISCED) levels 25 (lower-secondary vocational education), 35 (upper-secondary vocational education), and 45 (post-secondary nontertiary vocational education).

The report relies on a combination of previous studies, rigorous impact evaluations, and lessons learned from country engagements of partner institutions. The World Bank, ILO, and UNESCO have a long history of supporting TVET reforms in L/MICs. This report brings together global knowledge on the topic and the practical experience of development partners to support a common understanding of the main challenges for TVET, lessons learned from TVET reforms, and what needs to be done differently in the future. In doing this, the report uses the latest data available: although most of the evidence is pre-pandemic, lessons from the COVID-19 experience are also examined.

BOX 1.2.
Definitions Used in the Report

TVET: UNESCO-ILO recommendations define vocational and technical education as "a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life" (UNESCO and ILO 2002). Depending on the context, the terms used may differ, such as apprenticeship training, vocational education, technical and vocational education, occupational education, career and technical education, or workforce development, but all refer to similar concepts. In attempts to address the many challenges that exist in TVET, umbrella concepts such as competence-based vocational education and training have gained traction because they combine the needs of the labor market and entrepreneurship (including self-employment), the digital economy (including hybrid work and learning), the increasing importance of on-the-job training, and cognitive and socioemotional skills. In line with the decision of the TVET World Congress held in Seoul in 1999, this report adopts the term TVET.

Formal TVET:[a] technical and vocational programs offered within the formal education system that lead to degrees or other certifications. At the secondary level, TVET tracks are typically offered to upper-secondary (ISCED 3) students. However, in some countries, such programs also exist at the lower-secondary level (ISCED 2). Beyond formal TVET at the secondary level, students can enter post-secondary nontertiary (ISCED 4) TVET programs that offer access to certifications in specific occupations and skills. While TVET may be provided at the short-cycle tertiary (ISCED 5) level, the discussion in this report does not include tertiary TVET unless otherwise specified.

The main distinction between formal and nonformal programs is that the former are intended to contribute to qualifications that are recognized by national authorities and can provide access to higher levels of education and trainining.

Nonformal TVET: training and education offered outside the formal educational system. Entry into such programs does not necessarily depend on the completion of formal education. Non-formal TVET is provided by, among others, national training institutes, private institutes, adult and community education providers, and training within firms. Unlike formal TVET, which often leads to a diploma or a certification, nonformal programs may increase skills and employability, but do not necessarily certify the education received.[b]

Informal TVET: skills acquisition through learning-by-doing. Experience derived from practicing a: trade or by working with others can lead to the acquisition of skills that can increase the productivity of the person learning. This form of learning is common in the world of work, especially in entry-level and low-skilled jobs.

General education: programs that "are usually designed for students planning to continue to academic or professional studies at the tertiary level" or "who have completed upper secondary education but wish to increase their opportunities to enter tertiary education" (OECD, European Union, UNESCO Institute for Statistics 2015). General secondary education programs may include vocational streams that include TVET subjects but do not lead to a formal vocational qualification.

Basic education: education that precedes the earliest entry point into TVET (lower-secondary, upper-secondary, or post-secondary). Thus, basic education can encompass pre-school, primary education, and, depending on the entry point into TVET, none, some, or all of secondary education.

a The definitions of formal, nonformal and informal TVET are taken from Hanni 2019.

b The successful completion of a nonformal education program or a nonformal educational qualification may also give access to a higher level of education, if it is appropriately validated and recognized in the formal education system.

c Initial education is the formal education of individuals before they enter the labor market, i.e., when they will normally be in full-time education.

This report is organized as follows. Part 1, chapters 1 and 2, sets out a conceptual framework to organize the objectives, features, and foundations of well-functioning TVET systems. Part 2, chapters 3 through 7, applies the framework to identify the difficulties L/MICs must deal with in TVET to respond to current and evolving labor market needs. Part 3, chapters 8 through 12, is concerned with policy, drawing from the small but growing evidence base on TVET systems in L/MICs; practices and experiences around the world that have proved to be promising; and, in selected areas, lessons from well-functioning TVET systems in more advanced economies. The report concludes this Part with reflections on three transformations that are necessary if L/MICs are to improve their TVET so that it can contribute more to employment and productivity in support of sustainable economic transformation.

CHAPTER 2.

The Goal: Well-Functioning TVET for Better Employment and Higher Productivity

SECTION 2.1.

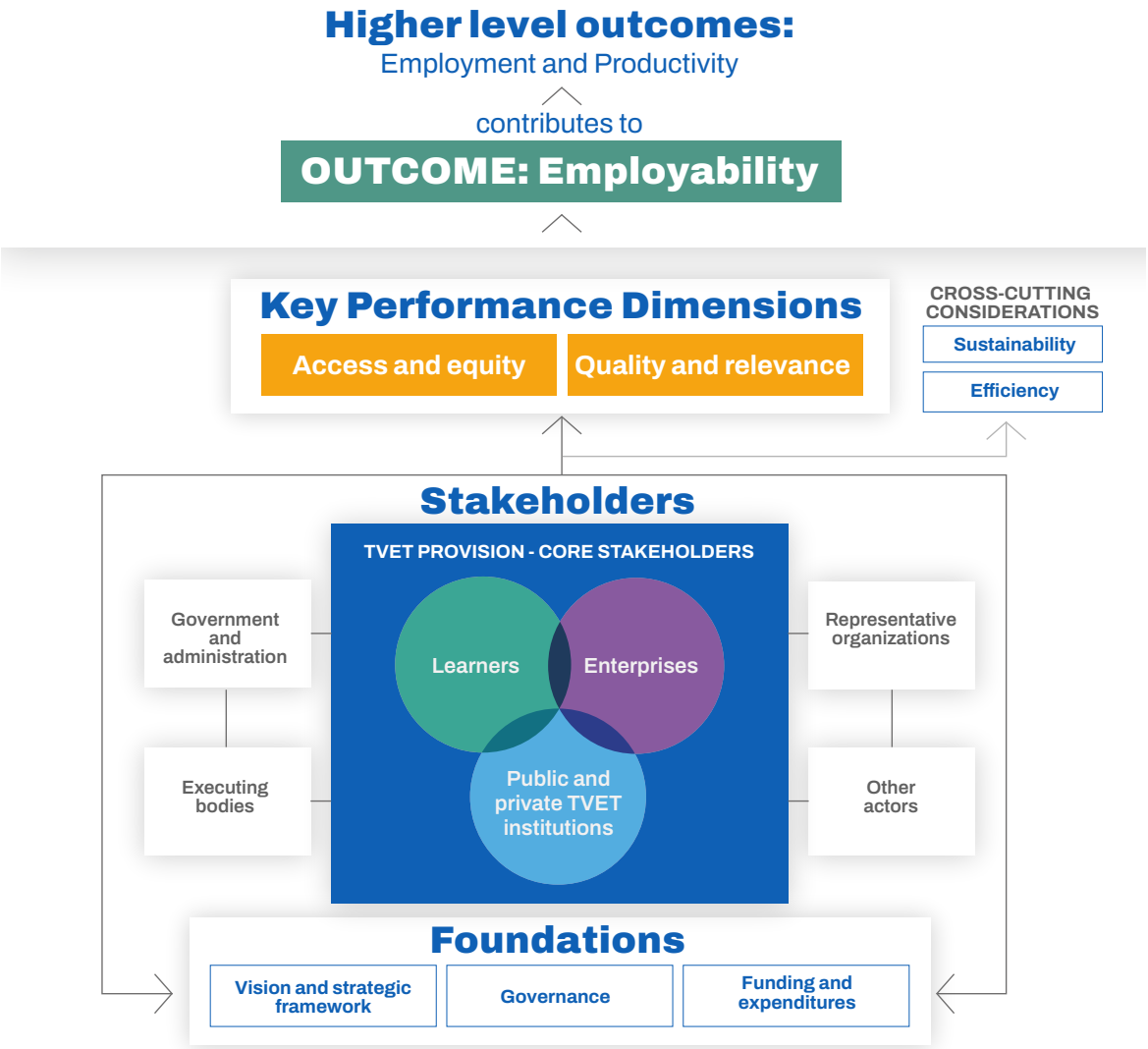
Conceptual Framework for a Well-Functioning TVET System

Although there is no one-size-fits-all blueprint for well-functioning TVET, successful programs seem to have several features in common. Because TVET can prioritize different educational, economic, and social outcomes, approaches that work in one place may not be desirable, effective, or feasible in others; much depends on the context and stakeholder preferences. TVET design is clearly shaped by such factors as traditions and cultural preference; the structure of the economy, labor markets, and labor institutions; the design of the broad education and training system within which TVET operates; and financial and human resources. Still, strong TVET programs appear to share common elements that may therefore be prerequisites for achieving more positive outcomes for, e.g., employment, productivity, and sustainability.[6]

The capacity of TVET programs to enhance employability and thus contribute to employment and productivity hinges on three interrelated elements: (1) their ability to meet "key performance dimensions" related to access, equity as well as quality and relevance, which are themselves buttressed by (2) productive (inter)actions among stakeholders, particularly learners, TVET institutions, and enterprises—and (3) solid foundations in terms of vision and strategic framework, governance, and funding and expenditure mechanisms. Like key performance dimensions, foundations and stakeholder actions are interdependent: TVET foundations are not only determined by stakeholders but also constitute the framework within which stakeholders operate. Figure 2.1 summarizes this conceptual framework that guides the structure and discussion in this report.

6 There have been a variety of efforts to identify the prerequisites for well-performing TVET (see e,g,, those discussed in World Bank 2013, UNESCO 2015, and UNESCO/ILO 2018). The conceptual framework presented in the remainder of this chapter is based on these efforts. The framework deviates at points from the models and frameworks each agency uses.

2.1: TVET for Employment and Productivity in Support of Sustainable Economic Transformation: A Conceptual Framework



Source: Based on Arias et al. 2019; UNESCO/ILO 2018; World Bank 2013; and ILO 2008; authors.

Note: In this report, "employability" is used to refer to the chances of obtaining and maintaining productive employment; "enterprises" and "employers" are used interchangeably to refer to both firms in the private sector and those in the non-governmental and public sectors.

SECTION 2.2.
Key Performance Dimensions of TVET: Access, Equity, Quality, and Relevance

The first key performance dimension for a formal TVET system is access, which determines how many people can enroll and benefit from acquiring the skills and related degrees or certifications programs in such systems deliver. As we discuss in chapter 4, in L/MICs there are many obstacles to learners who want to enroll in formal TVET. These may relate to supply-side constraints (e.g. limited number of TVET institutions in certain locations, lack of programs in certain specializations, or limited enrollment capacity in popular programs) or to demand-side constraints (e.g., affordability).

Equity, the second performance dimension, helps TVET to meet higher-level employment and productivity goals as well as broad social objectives by ensuring that skills are developed regardless of who and where the students are, and that opportunities are expanded for all learners. Often, TVET systems try to expand access so that more learners can enroll and participate in TVET. But more access does not necessarily imply more equity for groups at risk of exclusion. Equity in TVET also goes beyond access. First, equity is about ensuring that a learner's personal and social circumstances—for example, gender, income, residence, origin, migrant status, ethnicity, or disability—are no obstacle to accessing, learning in, or completing a TVET program. Second, equity is also about ensuring that disadvantaged learners are not tracked into subpar programs (UNESCO 2008 and OECD 2008).

As will be discussed in chapter 4, the question of equity in TVET is complicated by the path dependency inherent in L/MIC education systems. In many L/MICs, the most vulnerable often do not make it far enough in the education system to be eligible to enroll in formal TVET, and when they do qualify, they often are less prepared than students who have had the social and financial capital to access better-quality basic education. This is not surprising given the difficulties countries experience in improving the quality of basic education, particularly for the most vulnerable. Despite rising enrollments in primary and secondary education, global progress in learning has been limited (Angrist et al. 2021). Over 50 years, cohort effects show stagnation in school quality indicators in all regions, and a steep decline in South Asia and Sub-Saharan Africa. This is partly due to more disadvantaged students joining the system (Le Nestour et al. 2021). Teachers are dealing with much more heterogeneous classrooms, which is complicating their task (ADB 2009).

A third key performance dimension is quality as TVET systems strive to provide programs and services to their learners that meet high standards. TVET programs need to be delivered to industry standards, which requires well-equipped and adequately resourced institutions, prepared and empowered institution leaders, and continuously well-trained and motivated teachers and trainers that are incentivized and capable of delivering high-quality programs. Complementary inputs in the form of appropriate infrastructure and equipment as well as good-quality teaching and learning resources are also required to provide quality hands-on learning and assessment (World Bank 2013). Finally, quality training also means high-quality work-based learning, and thus the participation of enterprises themselves in training (Box 2.1.).

BOX 2.1.
Work-Based Learning

Work-based learning (WBL) takes place in a real work environment to provide learners with practical competences, facilitate the school-to-work transition, and stimulate coordination between education and the labor market (ILO 2017a). Because well-executed WBL entails coordination between TVET providers and employers, WBL contributes to the quality and relevance of TVET. It can also improve TVET access by expanding the capacity of TVET systems. For practical and work-oriented learners, TVET programs with strong WBL elements can be more attractive and easier to complete than purely school-based TVET. Moreover, when work-based learning placements are paid, TVET becomes more accessible for poorer learners, thereby promoting equity in TVET provision.

WBL is diverse, but the most common forms within formal TVET are apprenticeships, internships, and traineeships (Comyn and Brewer 2018; IAG-TVET 2017). In general, apprenticeships are thought to be more regulated, more structured, longer, and more likely than other forms of WBL to include a work contract. Formal apprenticeship programs are rare in most L/MICs, due both to the small scale of formal TVET itself, and because only a small percentage of formal TVET programs offer apprenticeships (Swisscontact 2019). Many L/MICs include internships or other types of industrial attachment components in their formal TVET, but evidence on the incidence or results of such initiatives is lacking.

Structural economic constraints, weaknesses in TVET system foundations, and stakeholder interactions hinder effective WBL in L/MICs. Given the dominance of informal and small firms in many L/MICs, the absorption capacity for work-based learners is limited (Allais 2020; ILO 2015). For example, in Malawi, the shortage of companies prepared to host learners is a major problem for its industrial attachment program (Matsimbe 2020). Lack of clear, adequate, and easy-to-monitor regulations, such as the pedagogical capacity of in-company mentors, curriculum requirements, or assessment procedures, also jeopardize successful implementation of WBL (Republic of South Africa 1998). Coordination failures, such as misunderstandings or disagreements on how WBL should be conducted, may also occur between a training institution and employers, which may affect monitoring and quality control. Such issues can weaken learning outcomes and increase the risk of exploitation of apprentices or interns. Finally, closures and limited operations of workplaces during the COVID-19 pandemic severely disrupted WBL, with distance learning options not able to replace on-site WBL (ILO et al. 2021; ILO 2021d).

Source: This box draws from the background paper on "Strengthening Apprenticeships and other Forms of Work-based Learning (WBL) in TVET" prepared for this report by Akojee, S., Billetoft, J., and Bridgford, J as well as on the following reports: Franz 2017, ILO 2012a, and ILO 2012b.

Finally, more than for other education subsectors, TVET's relevance to labor market needs shapes its ultimate outcomes. To contribute to employment and productivity and the broader goal of sustainable transformation, TVET needs to be highly responsive to the skills needs of the economy, both current and those that emerge as labor markets evolve. Training also needs to be relevant to the local work context, including economic and social activities. In L/MICs, where most enterprises are informal and small, where self-employment and household enterprises are predominant, and where the service sector absorbs most non-agricultural workers, TVET needs to respond to the realities. The mega-trends discussed in chapter 1 and impacting labor markets all over the world require TVET to be responsive or lose relevance.

Cross-cutting Considerations: Efficiency and Sustainability

Striving for access, equity, quality, and relevance can involve considerable systemic change and the cost must be reasonable. Given financial, time, and capacity constraints and competing priorities, policy decisions need to be buttressed by considerations of both efficiency and cost-effectiveness. These constraints bring to the fore the many trade-offs that policymakers need to grapple with setting spending priorities within TVET, between TVET and the rest of the education system, and between TVET and priorities beyond education. Resource scarcity will similarly require all TVET stakeholders to balance their own priorities.

Finally, sustainability needs to be a critical cross-cutting consideration for TVET reforms. On the one hand, greening TVET implies supporting sustainable practices and facilitating the transition to climate-resilient societies and greener economies. TVET is expected to support the green transition by equipping learners with the skills and competencies that will be needed as jobs change and new occupations and sectors emerge (ILO 2022b; UNESCO 2017). On the other hand, sustainability also requires making TVET systems more resilient to ensure that the progress made on other performance dimensions is sustained and that, in times of crisis, potential negative long-term effects are minimized. Resilience can also boost efficiency as investments that make TVET systems more resilient, even if requiring additional resources today, can lead to fewer expenses in the future. A system that is not resilient risks slow progress towards goals due to setbacks associated with idiosyncratic and aggregate shocks. The COVID-19 pandemic is again illustrative here: when national lockdowns closed the doors of educational institutions and shut down many enterprises participating in work-based learning, most TVET systems lacked formal crisis response strategies, so TVET institutions and the agencies governing them had to scramble to maintain any access to learning (ILO et al. 2021; ILO 2021b). Such disruptions can cause significant learning losses, as has been documented for basic education (Azevedo et al. 2021), a permanent disengagement from further education and training, and a substantial earnings penalty in the future (Portes 2020).

Both the key performance dimensions of access, equity, quality, and relevance and the cross-cutting considerations of efficiency and sustainability are likely universal, but barriers to achieving them vary by country. While there is no universal solution to overcome the diverse challenges, achieving progress requires sound TVET foundations and effective stakeholder interactions.

SECTION 2.3.
Strong Stakeholder Interactions

How well TVET functions in aligning skills supply and demand depends on a wide range of stakeholders, all of whose actions and interactions shape its ability to improve its performance and achieve the needed outcomes. Stakeholders on the supply side are responsible for the provision and regulation of education and training programs and services; others on the demand side are TVET users and clients. Finally, there are stakeholders in the middle, whose function is to mediate between supply and demand to facilitate good matches between learners and institutional programs or services.

Among numerous TVET stakeholders, learners, TVET institutions, and enterprises stand out as being directly involved in formal TVET. *Learners* are defined broadly to include not only those currently engaged in a TVET program but also those who may be thinking of pursuing TVET pre-employment or for reskilling or upskilling and those who have completed their TVET studies and are either transitioning to the world of work, pursuing further education, or already employed. *TVET institutions*, private or public, provide formal training; within them are additional stakeholders, such as managers and teachers. *Enterprises* are the third essential group of TVET stakeholders and, together with learners, its key client. We define enterprises widely to encompass private, nongovernmental, and public employers regardless of size or whether they are formal or informal, self-employed, or household enterprises. In addition to generating critical labor market information and employing TVET graduates, they contribute to TVET by advising on curricula, supplying financial resources, and enabling WBL.

Compared to general education, in TVET the centrality of employers as labor market stakeholders stands out. There are three ways in which employers, individually or through their organizations, can influence TVET outcomes—through actively providing training or WBL (*providing*); by influencing and defining TVET's fundamentals (*shaping*); and by financing third parties to provide TVET (*funding*). Employers can engage in these three areas—providing, shaping, and funding—in different ways (Box 2.2.). As TVET matures, employers typically engage in many if not all the approaches identified in Box 2.2. When TVET is less developed, employer engagement can be gradually deepened, with the choice of approaches depending on the context, possibilities, and preferences of employers and other stakeholders (Hoftijzer and Cunningham 2020; UNESCO 2019).

BOX 2.2.
Different Roles of Employers and Their Representatives in Formal TVET Systems

A. **Provide TVET** by being directly and actively involved in skills development and training. This can include:
   - **Providing formal TVET** through apprenticeships or other forms of work-based learning in collaboration with TVET institutions, or providing training in modular form as part of a qualification framework independent of TVET institutions;
   - **Managing training** through, e.g., industry-led dual training or TVET institutions;
   - **Managing employees within firms in ways that build skills**, through, e.g., performance-based remuneration practices or explicitly facilitating staff learning on the job.

B. **Shape TVET** indirectly by influencing its fundamentals. Influencing can range from a relatively modest advocacy role to intensive engagement in drafting and applying skills-related strategies and policies. Activities may include:**Informing on skills needs** by providing labor market information, developing labor market intelligence, or leading or participating in labor market observatories, sector skills councils, and similar groups;
   - **Supporting system design** by advising on the drafting or revision of reform strategies, regulations, or governance, management, and funding mechanisms;
   - **Supporting implementation**, e.g., contributing to the formulation of occupational standards and competency-based curricula; participating in assessments of quality or learning outcomes; and certifying or participating in certification procedures.

C. **Fund TVET** by contributing financial or in-kind resources to third parties, such as public or private training providers, to procure or improve training. Examples include:
   - **Procuring training**, paying third parties to provide specific training for specific workers;
   - **Funding contributions** to training institutions of materials, equipment, or funds, or arranging for expert staff to teach;
   - **Contributing to training funds**, which can finance different types of formal and nonformal TVET for pre-service and in-service beneficiaries.

Source: Hoftijzer and Cunningham 2020.

Beyond this core, other actors are also part of the complex TVET ecosystem. Among them are *government and administrative bodies*, such as TVET agencies and national and subnational line ministries that set policy and regulate, manage the entire process, or operate institutions and programs within it. *Representative organizations,* such as employers' organizations, workers' organizations, teachers' unions, student and parent associations, professional groups, and networks of public and private TVET institutions. Like employers, workers' organizations can also have a significant role in TVET (Bridgford 2017), particularly in shaping it (Box 2.3.). Other actors, particularly public and private intermediation services, counselors, and career guidance services, contribute to the success of TVET by supporting the transition from training to work. So do *executing bodies* responsible for policy implementation or regulatory oversight. These bodies may be public, private, or result from a public-private partnership; they include, for example, agencies responsible for curriculum development, accreditation and certification, quality assurance, teacher development, and the collection of labor market data. Finally, there are *other actors* who influence TVET less directly, such as academics, civil society organizations, local communities, and international development partners.

As in other areas of skills development, the rationale for government interventions in TVET lies in the presence of market failures or institutional frictions and in supporting equity. Credit constraints may prevent individuals and firms from investing in training. Firms may well be reluctant to invest in on-the-job training, particularly in transferable skills, if workers are very likely to find new jobs after being trained (poaching externalities), and individuals may also underinvest in acquiring skills if employers have the bargaining power to keep wages low (bargaining externalities) (Almeida et al. 2021). Similarly, at least in selected fields, there can be significant social benefits associated with TVET investments that go beyond benefits to individuals or specific firms (e.g., fields of study related to the green transition, emerging sectors, or sectors that can have positive spillover effects in terms of productivity or employment). Since individual learners or firms do not consider these additional benefits in making their decisions, there is less training than is optimal for society. In making decisions on investing in skills, firms and individuals may also lack relevant information, for example on labor market skills needs, different aspects of TVET provision, or the quality and relevance of training. Governments also have a critical role in ensuring equity in TVET. Without government action, vulnerable groups like youth, women, and individuals from poor socioeconomic backgrounds may be left behind in acquiring the skills necessary for employability.

BOX 2.3.
Workers' Organizations in TVET: Global Examples

Workers' organizations are vital social partners in TVET and skills development. They contribute to many aspects of TVET, from standard-setting and governance to financing, delivering training, and assessing outcomes. For instance:

Botswana:
Tripartite Human Resource Development Committees' Training Plans

In Botswana, Human Resource Development Committees (HRDCs) operate under the Human Resource Development Council. The committees are each chaired by key employers in a given sector and include representatives of employees, education and training institutions, civil society, government and even the informal sector. Each HRDC helps identify sector skill priorities and signs off on sector plans. The sector plans contain information about skill shortages and occupations where demand for workers is expected to be highest. The sector-specific information is reflected in the career information available through the Botswana Labour Market Observatory. The HRDCs have also put together sector-specific career information packs to promote learning and map employment pathways in their sectors.

Jordan:
Standards Setting by Tripartite Sector Skills Councils (SSCs)

In Jordan, since 2017 SSCs have been gradually established in priority sectors like Tourism & Hospitality, Information Technology, Chemical Industries, Agriculture, and Water. The SSCs, which include workers' organizations as members, have been given responsibility for formulating and reviewing occupational standards, which outline the competences required for specific jobs and are used by TVET institutions when creating course offering to ensure that they reflect industry needs. The SSCs draw up their standards in partnership with the Technical and Vocational Skills Development Commission (TVSDC), which is the national regulatory and quality assurance body for TVET curricula and qualifications. TVSDC provides technical support and partners with the SSCs to draft, revise, and finally endorse the standards on behalf of the sector they represent. Over time, it is envisaged that the SSCs will become custodians of a given sector's occupational standards and manage the sector's competency framework.

South Africa:
Representation of Workers' Organizations on National Consultative Bodies

Workers' organizations are represented on the National Skills Authority, which advises the Ministry of Labour on skills issues and the Human Resource Development Council of South Africa, which is a national multi-tiered and multi-stakeholder advisory body, which is tasked to stimulate employability

and promote a culture of training and lifelong learning at individual, organizational, and national levels. The Council is supported by a technical working group chaired by the Congress of South African Trade Unions, the largest trade union confederation; the South African Qualifications Authority, which oversees the development and activation of the National Qualifications Framework, and the Quality Council on Trades and Occupations, which is responsible for overseeing the design, implementation, assessment, and certification of occupational qualifications.

Latin America:
Workers' Organizations in the Management of TVET Institutions

Workers' organizations are represented on the board of directors of national training institutions in a number of countries in the region, among them the National Employment and Vocational Training Institute in the Dominican Republic, the National Learning Institute in Costa Rica, the National Vocational Training Institute for Human Development in Panama, and the Technical Institute for Training and Productivity in Guatemala.

The Philippines:
Workers' Organizations Delivering Training

The Associated Marine Officers' and Seamen's Union of the Philippines–Philippine Transport General Workers Organization is the country's largest union of seafarers and an example of a workers' organization as a direct provider of TVET and academic programs. The organization owns and manages three training and academic institutions. Its Seamen's Training Centre has 35 basic and advanced training courses, which since 2003 have enrolled more than 30,000 learners.

Source: ILO 2021c; ILO 2019; ILO 2017a; OECD 2014.

For a TVET system to perform well, interactions between stakeholders should be transparent, diverse, and of appropriate intensity. Each stakeholder needs to interact with all or most of the others. For example, policymakers from different domains and government levels should coordinate among themselves; communicate with learners; guide and consult with TVET institutions and enterprises; consult with industry organizations; direct and monitor the activities of implementing bodies; and seek information from researchers.

The interests of the different stakeholders may be far apart, or even in tension. For example, a government may prioritize the expansion of access to TVET in order to engage youth in educational activities and deliver on national and international policy commitments, but TVET institutions may face significant constraints in terms of infrastructure and equipment as well as in recruiting and deploying adequately trained teachers; at the same time, enterprises may care more about the quality and relevance of TVET training than the number of students a program enrolls. The large number of stakeholder groups, and the heterogeneity within them, result in differing perspectives, cultures, and interests. This complex landscape makes stakeholder cooperation both crucial and complex, particularly in a context where the private and public sectors are very fragmented, a large informal sector makes it difficult to achieve adequate representation, technical capacity is more limited, or there is no tradition of close collaboration between TVET stakeholders (World Bank 2013). Decentralized systems in some L/MICs can also complicate the elaboration of roles and responsibilities between stakeholders in different parts of the system.

Given the potential for coordination failures, appropriate governance arrangements are needed at national, regional, sectoral, and local levels to ensure effective interactions among these stakeholders and alignment with national priorities. Ensuring this coordination is particularly needed when major reforms and innovations are developed or implemented or when new partners or new procedures are introduced. Coordination is also key to ensuring that the most critical initiatives receive the necessary political and material support for experimentation, consolidation, and maturation (World Bank 2013). Effective coordination requires leadership at a sufficiently high level to overcome barriers to cooperation, along with clearly defined roles and responsibilities that foster communication and set the stage for coherent and well-coordinated actions. In addition, stakeholder capacity needs to be effectively developed to achieve these objectives, and sufficient resources must be allocated to enable activities to be implemented as planned.

Strong stakeholder interactions matter for TVET outcomes. Some insights into effective stakeholder interactions can be taken from TVET systems with strong apprenticeship or dual training models. In Austria, Denmark, Germany, and Switzerland, strong ties between TVET institutions and social partners are considered central to the functioning of the system and to ensure that graduates enter the labor market with quality, relevant skills. Employers in Germany and Switzerland, for example, play an important part in providing apprenticeship opportunities, but they also contribute to the curriculum design, financing, and implementation of TVET programs. In Denmark, employers also lead the process of curriculum updates, which is essential for preventing obsolescence due to changes in technology and skills needs (OECD 2020; Renold et al. 2016).

SECTION 2.4.
TVET Foundations: Vision and Strategic Framework, Governance, and Funding and Expenditure Mechanisms

The performance of TVET systems rests on three pillars: (i) vision and strategic framework ("plans"); (ii) governance arrangements ("tools"); and (iii) funding and expenditure mechanisms ("funds").[7] In well-functioning TVET systems, the building blocks are well aligned with each other and contribute to improving access, equity, quality, and relevance.

Vision and Strategic Framework

A solid foundation starts with a clear vision of about TVET's role in the education and training system, the economy, and society. A clear vision that is shared among TVET's stakeholders can then be the basis for a strategic framework that sets up the design, specific objectives, and outcomes for the system, along with the critical

7 This conceptualization of TVET foundations adapts the framework of the seven functions of vocational education and training governance, developed by the European Training Foundation (ETF 2019).

elements necessary to achieve them. Such a vision needs to be realistic about the system's strengths and weaknesses and the constraints and risks posed by the overall economic environment. A vision and strategic framework would answer important questions such as: What are TVET's objectives and how should these be measured? What types of skills should TVET focus on (particularly vis-à-vis general education) and how? What is the role of work-based learning and what balance should be struck between public and private provision, and school-based versus apprenticeship-based training? How will TVET be integrated and articulated with the rest of the education and training system? How will the roles and responsibilities of different stakeholders be agreed and monitored? How will the system be financed and by whom?

The answers to these questions will differ by country, but many of the trade-offs policymakers will face are common. For example, a country's stage of economic transformation, characteristics of its economy and labor market (key sectors, structure and competitiveness of the business sector, degree of informality, cost of labor), the educational endowment of the workforce, and overall demographics will shape TVET. But in all cases, given limited resources and capacities, there are likely to be trade-offs that need to be carefully considered. A clear vision helps define key principles to weigh these.

One key trade-off refers to how much to invest in skills that prioritize aggregate growth and economic transformation versus skills that prioritize inclusion and focus on the needs of low-skilled youths and adults working in low-productivity jobs (Arias et al. 2019). The former can maximize economy-wide productivity through the prioritization of activities that are closer to the technological frontier and that can help develop high-value-added activities. However, such a focus likely leaves out most workers in L/MICs who earn their living in the informal sector or low-productivity wage jobs. Investment in skills for these latter jobs, in contrast, can improve livelihoods and earning opportunities, especially for the poor. The earlier the stage of economic transformation and the larger the stock of unskilled workers, the higher the trade-offs between aggregate productivity growth and overall employment and inclusion goals.

There are also trade-offs in the choice between investing in skills that respond to immediate labor market needs versus skills that put more weight on future labor demand. For all TVET systems, it is important to be demand-driven and respond to labor market signals (UNESCO and ILO 2018; World Bank 2013). The trade-off is whether to prioritize skills demanded today or those that will be needed tomorrow. For countries at earlier stages of the structural transformation process and/or with a large share of low-skilled youth, responding to immediate labor market needs means giving significant weight to the skills needed in agriculture, low-value-added manufacturing and services in a context of high self-employment. This needs to be weighed against the skills needed for tomorrow's transforming economies to ensure workers' adaptability and resilience in a changing world of work. As discussed earlier, TVET is often more effective than general education at helping youth transition from school to work, but lifetime earnings—even after adjusting for individual characteristics—tend to be, on average, higher among those attending general education (the evidence on this from L/MICs will be discussed in more detail in chapter 3). At least in part, the literature

attributes this outcome to the fact that traditional TVET focuses on imparting a set of deep but narrow technical skills that facilitate entry into a particular occupation but that, over time, limit labor mobility and make it difficult to increase productivity or move to better jobs (Arias et al. 2019; Woessmann 2019; Hanushek et al. 2017). As argued earlier, the effects of these trade-offs go beyond individual learners as countries with a more inflexible skills mix of their workforce will be constrained in their economic transformation and ability to foster inclusive growth. As labor markets continue to change, this trade-off is likely to become only starker.

Governance

To implement the vision and strategic framework for TVET, appropriate governance structures need to be in place. Governance relates to the formal and informal structures and processes designed to ensure the effective implementation of strategies and policies. This pillar includes the provision of legal, regulatory, and/or normative frameworks, the management of TVET provider networks, the management of public–private partnerships for TVET and skills provision, the evaluation and review of TVET policies, research and development, and the collection and analysis of data and statistics (ETF 2019).

Governance arrangements need to be aligned with the system's vision and strategic plans and be implementable within available financial and human resources. Governance arrangements shape the behavior of TVET stakeholders by laying out what can and should be done. Such arrangements would indicate, for example, by which rules stakeholders must abide; how they will be financed and how they may spend their budgets; and how they will be held accountable. TVET is also influenced by the framework that regulates the overall education and training system. This can include, for example, policies that establish how skills standards are developed and used, how qualifications, learning outcomes, and curricula (including learning resources) are defined, and how learning pathways link different types and levels of education. By specifying the levels at which learners can move from general education into TVET or from TVET to tertiary education, for example, such policies can affect the expected levels of foundational skills of learners entering TVET. It also has implications for equity and inclusion. TVET is also shaped by laws and policies that regulate employment and the labor markets. Regulations may stipulate, for example, whether TVET students are entitled to receive a wage or stipend during the work-based learning component of their programs. Where TVET is publicly provided, it is further shaped by the regulatory framework determining how public institutions are managed, for example, by defining recruitment and remuneration policies for teachers and other staff at public TVET institutions.

Good governance requires effective management. Good management includes the designation of clear, appropriate mandates and responsibilities across structures and bodies at all levels, the provision of these bodies with the resources and procedures needed to fulfill their mandates, and effective oversight and accountability. Importantly, good governance includes a clear separation of roles related to policy and financing, delivery, supervision, and evaluation, with the consideration of the appropriate roles for the government vis-à-vis the private sector.

When translating the general principles of good governance to TVET, several critical areas emerge. First, there needs to be a strong alignment between governance and the key performance dimensions of access, equity, quality, and relevance. In particular, the focus on quality and relevance can be achieved by, for example, assigning a prominent role to enterprises in program development and updating the skills of TVET teachers. Second, there needs to be a focus on ensuring a strong performance of (public and private) TVET institutions, through an appropriate balance of autonomy, accountability, quality assurance, and compliance measures (UNESCO and ILO 2018; World Bank 2013). Third, and essential for achieving the first two priorities, is the emphasis on collecting labor market information to identify skills needs and data on TVET system performance (UNESCO and ILO 2018; World Bank 2013). Fourth, good TVET governance can facilitate the promotion of a culture of learning and continuous improvement, supported by adequate investment in labor market and TVET information systems (UNESCO and ILO 2018; UNESCO 2016). A culture of learning can thrive if governments see TVET policymaking as an inclusive and participatory process leading to broader participation and greater ownership. Building a culture of learning also requires mechanisms for evaluating the impact of TVET policy and programs, examining the scale-up prospects of pilot projects, and academic research. Finally, a culture of learning draws on stakeholders such as social partners, researchers, or practitioners and helps them move from the periphery to the centre of policymaking (UNESCO 2015b).

Funding and Expenditures

A final pillar of the system's foundations focuses on funding and expenditure mechanisms. Together with sound management, funding for TVET should be stable, predictable, sustainable, and sufficient (UNESCO and ILO 2018; UNESCO 2015b; World Bank 2013). This includes ensuring that mobilization draws on a range of sources, that resource allocation is based on appropriate and transparent criteria, and that the impact of funding arrangements on the key performance dimensions is regularly monitored. While there is a range of mechanisms available for the mobilization and allocation of funding, the role of financial incentives should not be neglected as they can be effective means to support learners (i.e., via scholarships that facilitate TVET access for disadvantaged groups) or TVET providers (i.e., via performance-based payment schemes to align performance with recruitment, attendance, or employment objectives) (Clarke et al 2021).

TVET financing can come from diverse sources through different modalities. There are, broadly, three main domestic sources of formal TVET financing: governments, households, and employers. Cost-sharing between these sources can be efficient while reducing reliance on a single source. Additional sources can include income-generating activities of TVET providers (Palmer 2018). In many L/MICs development partners and external assistance are also a source of funding. The funding from each actor can take different forms. Household expenditures, for example, can cover tuition fees, the costs of learning materials and travel expenses, but also include the opportunity cost of foregone wages. Household costs can differ considerably across

fields of study, levels, and institutions (Arias et al. 2019). Financing sources for public and private TVET providers are often quite distinct, with public providers in most cases relying almost exclusively on government funding whereas private providers draw much more on the financing from households and firms. Financing mechanisms can also differ, as central or sub-national governments may provide funding to individuals, TVET providers, and enterprises providing workplace training. Funds can be provided directly (through transfers) or indirectly, such as through tax exemptions or vouchers (UNESCO 2022c; Hanni 2019; UNESCO 2018b). Given the complex nature of TVET financing, social dialogue involving employers and workers' representatives is important to develop sustainable financing arrangements in TVET.

Relying on multiple funding sources and modalities comes with both advantages and disadvantages. On the plus side, it can reduce overreliance on a single source and enhance stakeholder engagement and ownership. For example, the implementation of income-generating activities (like the sale of goods and services produced by trainees, renting equipment to local businesses, or delivering services through community projects) can help TVET providers engage with local firms, establish a better understanding of the local labor market, and provide experiential learning opportunities to students (UNESCO-UNEVOC 2017b). On the other hand, income-generating activities can divert attention from the core activities of TVET providers and reliance on household expenditures may deepen equity and inclusion challenges. In addition, drawing on multiple funding sources requires strong coordination and collaboration between actors; otherwise, it can exacerbate fragmentation in the TVET system, particularly in contexts with weak governance (Palmer 2017). Additionally, some sources of funding can create distortions in other areas, as for example, the case of training levies on employers that increase the cost of (formal) labor and can hence affect competitiveness and formal job creation (UNESCO 2022c). Such impacts need to be explicitly considered when making financing decisions.

Most importantly, the way funds are spent can strengthen or weaken TVET's performance. TVET's performance may be strengthened when scholarships or other forms of financial assistance to disadvantaged students increase access and equity in the system. In contrast, TVET's performance may be weakened if a disproportionate share of expenditures goes to recurrent personnel costs, leaving insufficient resources to upgrade facilities, equipment, or learning materials, or to update the competencies of the teaching staff in order to deliver better quality TVET. Unit costs can signal inefficiencies in TVET or higher costs of providing access to some learners; and differences between costs per student and costs per graduate can point to inefficiencies related to course completion (Palmer 2018).

With this conceptual framework for understanding the outcomes, key performance dimensions, stakeholder interactions, and system foundations for TVET, we now turn to discuss the challenges of TVET systems in L/MICs and policy priorities moving forward.

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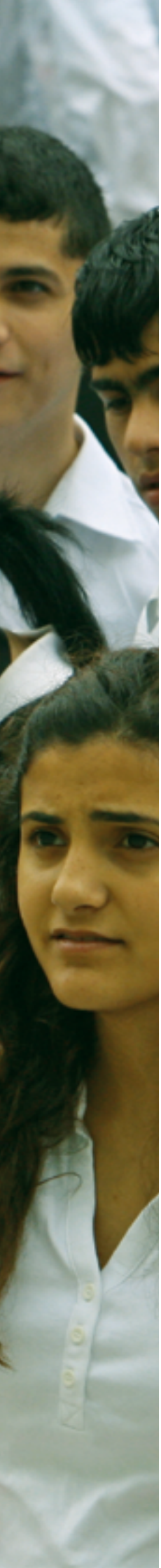


PART

2

THE TVET CHALLENGE

Many factors affect the performance of formal TVET in L/MICs. In most of these countries, systems are smaller, more male-dominated, and cater to more disadvantaged students than general education programs at the same education level, which undermines access and equity. Struggles with imparting in-demand technical skills on top of weak foundational skills, insufficient focus on work-based learning, under-prepared and under-supported teachers, outdated infrastructure and equipment, and lack of focus on the needs of learners and the private sector, hamper quality and relevance. Irregular and uncoordinated interactions among stakeholders hinder reform efforts. So do weaknesses in TVET foundations. Difficulties identifying skills needs, imbalances in providers' autonomy and accountability, inadequate use of quality assurance mechanisms, weak TVET management information systems, and limited use of performance-based monitoring and results-based financing stand in the way of greater contributions of TVET in L/MICs to employability, and ultimately productivity for sustainable transformation.

This part of the report discusses common challenges in TVET systems in L/MICs. Given differences in country contexts and in the design and performance of their TVET systems, what follows is necessarily a stylized discussion, guided by the conceptual framework outlined in chapter 2. Chapter 3 first discusses evidence on the returns to TVET in L/MICs based on impact evaluations and observational studies, because arguably improving labor market outcomes is the main goal of TVET systems. Then we delve into specific concerns about access and equity (chapter 4) as well as quality and relevance (chapter 5), before discussing obstacles to regular and active engagement among stakeholders (chapter 6) and the weaknesses in TVET system foundations (chapter 7).

CHAPTER 3.

Evidence of Returns to TVET in L/MICs: Mixed and Heterogenous

Though rigorous evidence on TVET's labor market impacts in L/MICs is growing, it is still very limited, particularly in LICs.[8] As discussed in chapter 1, TVET can have many benefits for society in addition to the benefits to learners, but without positive labor market returns, it becomes very difficult to justify investing in TVET. Measuring these returns adequately, however, is complex (Schueler and Loveder 2020). Studies examining the labor market impacts of formal TVET generally come in two varieties: rigorous impact evaluations of specific programs or observational studies of labor market returns by educational attainment. By randomizing participation in TVET or using a good comparator group, the first type of study can attribute employment or earnings impacts to enrollment or completion of TVET rather than other factors (whether observable or not) that could have influenced both TVET enrollment and labor market outcomes. However, only a few such studies have been conducted in L/MICs because they require either randomization of participation in a program or a natural experiment that includes a discontinuity, such as a threshold score in the eligibility formula. Another reason is the lack of capacity to conduct such sophisticated exercises.

Observational studies of TVET are much more common. They are usually based on regression analysis, explaining labor market outcomes as a function of education, experience, and other personal characteristics of the individual or features of the education itself. They often compare outcomes for graduates of TVET with those of general education programs at the same level. This method does not lend itself to causal inference due to the possibility that other variables not included in the model may have influenced the results, but these studies can establish a correlation between TVET degrees and labor market outcomes that can still be informative. A serious limitation of these studies, however, particularly in L/MICs, is that they tend to focus on wage employment and often fail to capture the self-employment and unpaid family work that are common in many of these countries. Selected studies discussed below and earlier studies on returns to TVET are summarized in Table 3.1 and Annex 3.1.

8 For a review of earlier evidence from developing countries, see Table 3.1 in Almeida et al. 2012.

Table 3.1: The Evidence on Average Impacts of TVET on Employment and Earnings is, at Best, Mixed

	Impact evaluations		Observational studies		
	^ Positive impacts	— No impacts	^ Better than general	— Similar to general/ mixed	v Worse than general
Employment	3 (MNG, NPL, BRA-women)	4 (NMB, SLV, TUR, BRA-men)	—	—	—
Earnings	4 (NPL, BRA-women, MNG-women, KEN-wage earners)	6 (NMB, SLV, TUR, BRA-men, MNG-men, KEN-nonwage earners)	6 (BRA, CHN, EGY, LKA, THA, TUR)	5 (IDN, IND, PHL, ROU, TZA)	4 (EGY, PAK, RWA, SUR)

Source: Impact evaluations: Mongolia (MNG): Field et al. 2019; Nepal (NPL): Chakravarty et al. 2019; Brazil (BRA): Camargo et al. 2018; Kenya (KEN): Hicks et al. 2016; Namibia (NMB): Borkum et al. 2017; Türkiye (TUR): Hirshleifer et al. 2016; El Salvador (SLV): Campuzano et al. 2016. Observational studies (implemented through Mincer regressions): Egypt (EGY): El-Hamidi 2006; Sri Lanka (LKA): Riboud et al. 2007; Thailand (THA): Moenjak and Worswick 2003; Brazil (BRA): Almeida et al. 2015; China (CHN): Guo and Wang 2020; India (IND): Riboud et al. 2007; Romania (ROU): Malamud and Pop-Eleches 2008; Tanzania (TZA): Kahyarara and Teal 2008; Indonesia (IDN): Newhouse and Suryadarma 2011, Mahirda and Wahyuni 2016; Pakistan (PAK): Riboud et al. 2007; Rwanda (RWA): Lassibille and Tan 2005; Egypt (EGY): Krafft 2018; Suriname (SUR): Horowitz and Schenzler 1999; TUR: Patrinos et al. 2019.

Rigorous evaluations of formal secondary TVET in L/MICs suggest that though its impacts on labor market outcomes can be positive, they are often small and almost always vary widely. For example, an impact evaluation in Mongolia found that being randomly given a spot in an oversubscribed formal secondary vocational program increased the likelihood of being in paid employment one year after graduation by 4 percent and the likelihood of holding a paid job for longer than one month by 9 percent. Women benefitted more from TVET, because their employment effects were higher than those of men; their monthly earnings were 13 percent higher than those of women who did not receive a spot in the program (Field et al. 2019). Critically, impacts grew over time.[9] Another oversubscription-based randomized experiment in Brazil revealed positive returns in terms of employment and earnings for women who were admitted to two-year vocational education courses, while finding no effects for men (Camargo et al. 2018). In Kenya, the heterogeneity of impacts was by employment type rather than gender: a program that gave vouchers to youth to participate in TVET in formal private or public institutions found limited evidence of average impacts on earnings; hourly wage increases were only observed among wage earners (Hicks et al. 2016). However, in some contexts, positive labor market impacts cannot be observed for any subgroup: randomized scholarships combined with strengthening for technical secondary schools in El Salvador produced higher enrollment and completion but no positive impacts on employment outcomes or earnings one year after graduation, although there was a positive effect on enrollment in post-secondary technical education (Campuzano et al. 2016).

9 Higher impacts over time are also increasingly found in evaluations of short training programs (Attanasio et al. 2015; Ibarraran et al. 2019; Kugler et al. 2022).

This significant heterogeneity is also reflected in observational studies of formal secondary TVET. Observational studies in Türkiye have consistently revealed that upper secondary vocational education has higher returns than general secondary school, with the most recent estimates of the return to one year of schooling being 4.2 percent for vocational and 2.4 percent for general secondary education (Patrinos et al. 2019). In Brazil, completion of upper secondary technical school has been estimated to yield, on average, a 9.7 percent wage premium relative to completion of general secondary education (Almeida et al. 2015). In China, adults who had attended upper-secondary vocational programs earned, on average, 8–11 percent more than matched low-performing students who had attended academic high schools (Guo and Wang 2020). In Indonesia, returns to vocational and general secondary education were found to be similar (Mahirda and Wahyuni 2016). On the other hand, in Egypt, a study found the returns to formal vocational secondary education to be virtually the same as having no formal education at all (Krafft 2018).

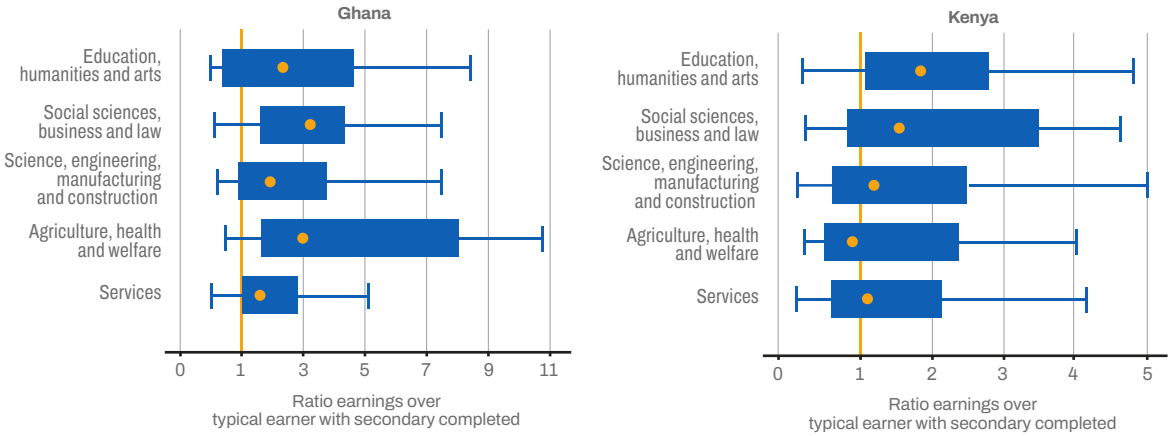
The evidence on returns to post-secondary or continuing TVET is even sparser, but what does exist, particularly in LICs, also suggests that impacts vary widely. In Namibia, randomized allocation of scholarships for vocational training in oversubscribed programs improved enrollment and self-reported training completion, particularly for women, but did not have much impact on employment outcomes and earnings (Borkum et al. 2017). Similarly, in Türkiye, an evaluation of large-scale vocational programs that included some skills certification showed no average impacts on employment three years after the training and only transitory impacts on the quality of employment (Hirshleifer et al. 2016). On the other hand, a large youth training intervention in Nepal, evaluated using a regression discontinuity design, generated an increase in non-farm employment of 10 percentage points (pp)—with spurts of as much as 31 pp for participants who completed the program. The program also produced sizable gains in monthly earnings, especially for women who started self-employment activities within their homes (Chakravarty et al. 2019). An observational study in the Philippines showed that graduates of post-secondary TVET programs are more likely to be employed and have significantly higher wages than those who completed secondary education or less, but it also shows that those who combined low-level TVET degree with one or two years of tertiary education had lower earnings than those who only completed secondary (Vandenberg and Laranjo 2020).

Quality apprenticeships can pay off for both firms and workers. In Brazil, apprentices were found to have a greater chance of finding a non-temporary formal job and earn higher wages in the short and the medium term than comparable people who did not participate in the program (Corseuil et al. 2014). A subsidized dual training program in Côte d'Ivoire led to a strongly positive and significant increase in the value of work by apprentices in treatment firms (Crépon et al. 2018). It is important that most, if not all, of the evidence comes from MICs.

One way of reading the evidence is that most TVET systems are not simply good or bad; the TVET landscape in most countries is diverse, and employment and wage outcomes vary widely between and within fields of study as well as TVET institutions. Arguably the most accurate way of describing the labor market impacts of TVET is that they are very heterogeneous. One study in Türkiye found significant variation in returns to vocational high school and university fields of study. For vocational high school degree holders, the wage premium relative to non-degree holders varied from –15.2 percent for security services to +13.5 percent for transport services and environmental protection (Aydede and Orbay 2016). This same variability in returns is found across and within fields of study in Kenya and Ghana. In these countries, for all fields of study, there are both high shares of graduates with negative returns and high shares with positive returns compared with those of a typical worker who completes secondary education (Figure 3.1). Similarly, graduates of formal short-term training courses in Bangladesh experienced very different employment rates six months after graduation, depending on their field of study and the training provider (Figure 3.2).

Figure 3.1: Returns to TVET in Kenya and Ghana Cover the Spectrum from Positive to Negative, with Wide Variation between and within Fields of Study

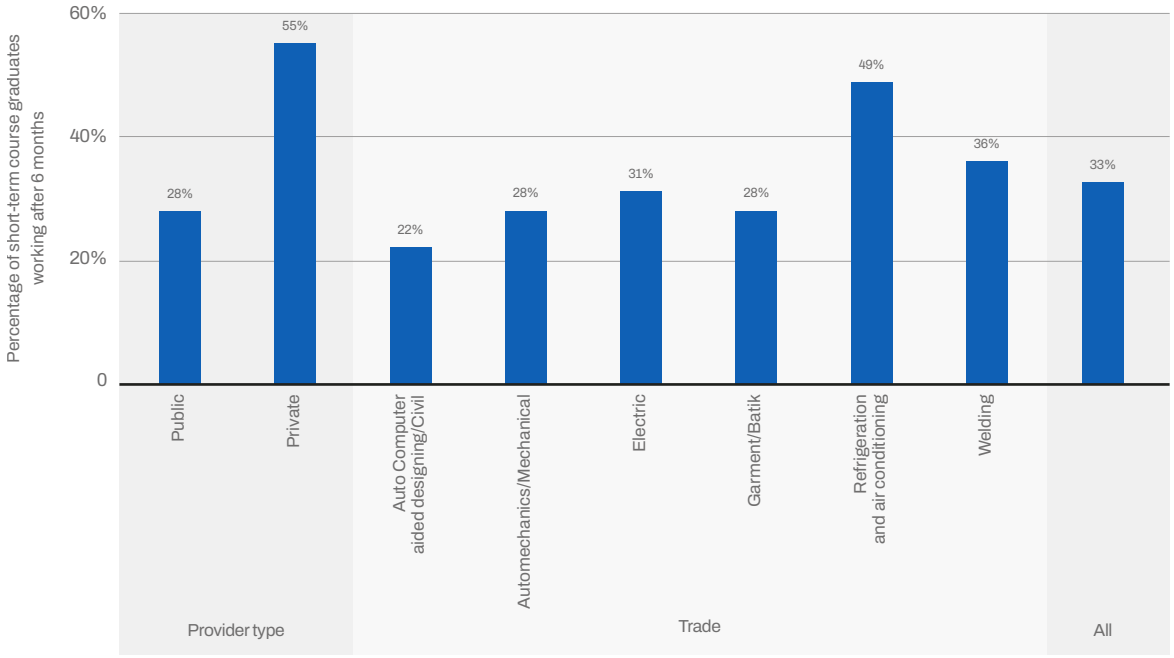
Ratio of earnings of a worker with TVET to those of a typical worker with a complete secondary education (whether technical or general)



Source: Arias et al. 2019. Based on Skills Towards Employability and Productivity (STEP) Household Surveys.

Note: The orange dot represents the median of the distribution. The lower end of the box represents the 25th percentile and the upper end the 75th percentile. The lines outside the box represent the ratio for the highest and lowest values of earnings excluding outliers.

Figure 3.2: Bangladesh: Employment of TVET Graduates Varies Widely by Field of Study and Institution Type



Source: World Bank 2015a.

Note: Results are from a 2013–14 tracer study surveying randomly selected graduates of short-term TVET training programs.

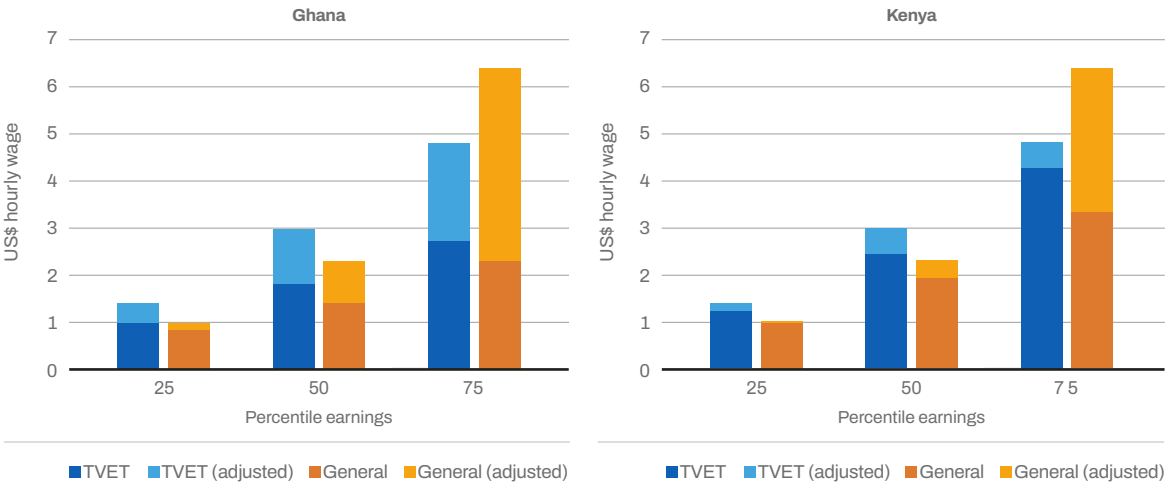
The heterogeneity in returns to individuals and fields of study means that TVET likely pays off for some students—perhaps even more than general education—while being a bad investment for others. Analysis for Ghana and Kenya indicates that whether TVET or general education is the best path for an individual depends on that person's characteristics and chances of continuing to university, where on average returns are the highest. In both countries, secondary TVET has a higher return than general secondary for individuals with less earning potential (Figure 3.3).[10] For this group—who may not have the academic readiness or resources for pursuing an academic track, especially at university level—TVET can be a better option given the constraints at the point where they are selecting the vocational or the general education track.

TVET returns also vary considerably over time: although TVET learners often have a more successful school-to-work transition than general education graduates, their prospects seem to deteriorate, at least in relative terms. Evidence from high- and upper-middle-income countries suggests that young TVET graduates have better employment outcomes than those with general education, but as groups age, this advantage eventually disappears (OECD 2020a; Woessmann 2019; Hanushek et al. 2017; Hampf and Woessmann 2016; Lamo et al. 2011). The same also appears to apply to other indicators of employment quality, such as type of contract or job responsibilities (OECD 2020a). Although the evidence is more limited, similar patterns have been identified in L/MICs. For example, in Brazil, the impact of upper secondary technical courses was lower for older individuals (Almeida et al. 2015), in Ghana and Kenya widening gaps in earnings were particularly pronounced among tertiary graduates (Arias et al. 2019).

10 There is also evidence of differential impacts of TVET depending on student socioeconomic background in advanced economies (OECD 2019).

Figure 3.3: TVET Pays Off in Some Contexts, Particularly for Individuals with Lower Earning Potential

Potential Hourly Earnings, by Track and Estimated Percentile of Earnings



Source: Arias et al. 2019.

Note: Estimates are from a quintile regression of earnings controlling for gender and potential work experience. The values shown are for a typical man with no work experience. The adjusted values account for potential earnings after completing either tertiary technical or university studies, adjusted by the probability of accessing such studies given the worker's socioeconomic status. The probability is estimated as the proportion of university (tertiary TVET) graduates among all workers with more than a general secondary education (secondary TVET), by socioeconomic status.

The literature attributes this relative deterioration in TVET returns over time to a lack of adaptability in TVET graduates—often linked to their foundational skills being weaker than those of general education peers and the fact that technical skills deteriorate faster than cognitive or socioemotional skills, particularly when labor markets are evolving rapidly (OECD 2020; Alfonsi et al. 2020; Hanushek et al. 2017; Hampf and Woessmann 2016; Arias et al. 2014; Heckman and Krueger 2005; Krueger and Kumar 2004). TVET is intensive in occupation-specific technical skills that may have immediate relevance when graduates enter the labor force, but as the economy's skills needs evolve, they are also more likely to become obsolete than the transversal skills that are more the focus of general education programs. Since TVET graduates often have a narrower base of both literacy / numeracy and socioemotional skills) than those with general education, they may also find it harder to undertake the upskilling and reskilling required to adapt to work-related changes (Deming and Noray 2020; Deming 2017; Goos et al. 2014; Acemoglu and Autor 2011; Goldin and Katz 2009). This is consistent with recent evidence from a rigorous evaluation of non-formal, short TVET programs in Colombia, which varied the degree to which the curriculum dealt with socioemotional skills. The study found that, while those exposed to the program emphasizing technical skills transition into employment faster, those exposed to the program emphasizing socioemotional skills catch up quickly and are more likely to keep their jobs (Barrera Osorio et al. 2020).

The high variation in TVET labor market returns by individuals, institution types, fields of study, and over time matter considerably: While getting TVET right can have significant positive impacts, it is often difficult to get such results consistently. Labor market returns demonstrate whether the skills provided by TVET are in demand and can be used productively. And although getting a return on TVET depends on many factors,[11] if there is no demand, TVET is simply not a good investment from a labor market perspective. Better understanding of the possible drivers of heterogeneity can help identify critical elements related to access, equity, quality, and relevance that need to be tackled to improve TVET.

11 See, for example, the case of Mongolia (Field et al. 2019).

ANNEX 3.1

Returns to TVET in Low- and Middle-Income Countries

Table A3.1.1 Returns to TVET and Other Labor Market Outcomes in Selected Low-and Middle-Income Countries

Country and Year of Study	Impact on Employment or Earnings	Methodology	Authors/ Publication year	Program Type/Level
Impact evaluations				
Mongolia (2010–12)	Random allocation of oversubscribed vocational schools **increased the likelihood of being in paid employment** one year after graduation by 4 percent and the likelihood of holding a paid job for longer than one month by 9 percent. For women, participation in the program increased monthly earnings by 13 percent.	Randomized control trial with OLS regression	Field, Linden, Malamud, Rubeson, and Wang (2019)	Formal secondary vocational
Nepal (2010 –12)	Large youth training intervention generated an **increase in non-farm employment** of 10 percentage points (pp) and up to 31 pp for those who completed the program. It also produced sizeable **gains in monthly earnings**, especially for women who started self-employment activities inside their homes.	Regression-discontinuity design with OLS regression	Chakravarty, Lundberg, Nikolov and Zenker (2019)	Certified classroom training and internship, for learners who did not complete lower secondary education
Brazil (2016)	Random allocation of oversubscribed vocational schools revealed **positive returns in terms of employment and earnings for women** admitted to two-year vocational education courses for current or former high school students; **no effects for men**.	Randomized control trial with OLS regression	Camargo, Lima, Riva, and Souza (2018)	Formal secondary technical education
Namibia (2009–14)	Randomized allocation of scholarships for vocational training (in oversubscribed programs) improved enrollment and self-reported training completion (results were almost 50 percent larger for women) and led to some participants re-enrolling in training but **did not have any significant impact on employment outcomes and earnings.**	Randomized control trial with OLS regression	Borkum et al. (2017)	Programs ranging from 1 to 21 months, mostly in hospitality and tourism, and construction
Kenya (2008-2014)	Limited evidence of average impacts on earnings, with only significant **hourly-wage increases observed among wage earners**.	Randomized control trial with OLS regression	Hicks, Kremer, Mbiti and Miguel (2016)	Varied level and duration, by public and private providers
Türkiye (2010–12)	**No average impact on employment** three years after vocational training and only **transitory impacts on the quality of employment**.	Randomized control trial with OLS regression	Hirshleifer, McKenzie, Almeida, and Ridao-Cano (2016)	Certified post-primary short courses
El Salvador (2011–15)	Scholarships combined with school strengthening program produced **no significant positive effect on employment outcomes and earnings**.	Randomized control trial with OLS regression (for scholarships)	Campuzano, Blair, Poggio, Padilla, Morgan, and Brannan (2016)	Technical secondary schools
Observational studies showing more favorable results for TVET than for general education				
Türkiye (2017)	Private returns to vocational secondary education are 6.5 percent, compared to private returns of 5.7 percent for general academic track.	Mincerian earnings regression	Patrinos, Psacharo-poulos, and Tansel (2019)	Formal secondary TVET

Country and Year of Study	Impact on Employment or Earnings	Methodology	Authors/ Publication year	Program Type/Level
Egypt, Arab Rep. (1998)	Returns to vocational secondary education are 35.4 percent; returns to general secondary education are 6.1 percent for men.	Mincerian earnings regression (1st stage: ordered logit)	El-Hamidi (2006)	Formal secondary vocational
Sri Lanka (2002)	Returns to formal vocational training are 17 percent compared with 7.9 percent for general education.	Mincerian earnings regression (not controlling for selectivity bias)	Riboud, Savchenko, and Tan (2007)	Any formal vocational training.[a]
Thailand (1989–95)	Returns to vocational education at the upper secondary level exceed those to general education by 63.9 percent for men and 49.4 percent for women.	Mincerian earnings regression (1st stage: probit)	Moenjak and Worswick (2003)	Upper secondary vocational education
Brazil (2007)	Positive and statistically significant wage premiums for students completing technical school at the upper secondary level (on average 9.7 percent) and for those completing short-term training courses (2.2 percent on average) compared to completing general upper secondary education.	Mincerian earnings regression (not controlling for selectivity bias)	Almeida, Anazawa, Menezes Filho and Vasconcellos (2015)	Formal upper-secondary TVET, and short term training
China (2008)	Adults who had attended upper-secondary vocational programs earned, on average, 8–11 percent more than matched low-performing students who had attended academic high schools.	Mincerian earnings regression (controlling for selectivity bias using propensity score matching)	Guo and Wang (2020)	Upper-secondary vocational programs
Observational studies showing no difference or mixed results				
India (2004)	Returns to formal vocational training are approximately 8 percent, comparable to returns to general education at 8.4 percent.	Mincerian earnings regression (not controlling for selectivity bias)	Riboud, Savchenko, and Tan (2007)	Any formal vocational training.[a]
Romania (1995–2000)	No significant differences in labor market participation or earnings between vocational and general education students.	Regression discontinuity	Malamud and Pop-Eleches (2008)	Formal secondary vocational education
Tanzania (1997–2000)	Returns are higher for high levels of academic education than for vocational or lower levels of academic education; the returns to vocational or technical education are lower the higher the level at which it is entered.[b]	Mincerian earnings fixed effects regression	Kahyarara and Teal (2008)	Secondary and post-secondary TVET
Indonesia (1993, 1997, 2000, 2007)	For men, no significant differences in earnings between public general and vocational graduates, but the youngest public vocational graduates experience a large wage penalty. For women, public vocational graduates have greater wage returns than general graduates. Public vocational graduates are also more likely to obtain formal jobs than public general graduates.[c]	Mincerian earnings regression (OLS and Least Absolute Deviations) (1st stage: multinomial logit regression)	Newhouse and Suryadarma (2011)	Formal upper secondary TVET
Indonesia (2007–08)	The study finds no difference in the returns to schooling between vocational and general high schools.	Mincerian earnings regression	Mahirda and Wahyuni (2016)	Formal secondary education
Philippines (2015–16)	Graduates of post-secondary TVET programs are more likely to be employed and have significantly higher wages than those who have completed secondary education or less, but those who completed a TVET degree and then pursued tertiary education had lower earnings than those who completed only secondary.	Mincerian earnings regression (controlling for selectivity bias)	Vandenberg and Laranjo (2020)	Post-secondary TVET

Country and Year of Study	Impact on Employment or Earnings	Methodology	Authors/ Publication year	Program Type/Level
Observational studies showing less favorable results for TVET than for general education				
Pakistan (2004)	Returns to formal vocational training are 8.1 percent, and to general education about 9 percent.	Mincerian earnings regression (not controlling for selectivity bias)	Riboud, Savchenko, and Tan (2007)	Any formal vocational training.[a]
Rwanda (2000)	Returns to vocational education are 18.4 percent, and to general secondary education 21.3 percent.	Mincerian earnings regression (1st stage: multinomial logit)	Lassibille and Tan (2005) / Education Rwanda (2004)	Secondary vocational and technical education
Egypt (1998, 2006, and 2012)	Returns to formal vocational secondary education were virtually the same as no formal education.	Mincerian earnings regression (controlling for selectivity bias)	Krafft (2018)	Formal secondary vocational education
Suriname (1990, 1992, 1993)	Returns to both general language and mathematics tracks exceed returns to technical or vocational education for both men and women.[d]	Mincerian earnings regression (1st stage: probit regression)	Horowitz and Schenzler (1999)	Junior secondary vocational and technical education tracks

Source: See table for detailed description of data sources.

Note: OLS: ordinary least squares.

a. As captured in Labor Force Surveys.

b. The returns for those who enter vocational schools after primary school are estimated at 9.6 percent compared with 8.8 percent for those who enter after completing lower secondary, and only 3.2 percent for those who enter after completing upper secondary. Similarly, the returns for those who enter technical colleges after completing lower secondary are estimated at 10.5 percent compared with 7.3 percent for those that enter after completing upper secondary.

c. Male public vocational graduates have a 6.2 percent greater chance of working in formal jobs than male public general graduates. The estimated wage penalty for male public vocational graduates in the youngest cohort was 20 percent in 2000 and 40 percent in 2007. Female public vocational graduates earn a wage premium (15.8 percent [OLS]) and 14.3 percent [LAD]) and are 8.7 percent more likely to obtain formal jobs than are public general graduates.

d. For men, the private returns to technical secondary education are 10.4 percent, compared with 11.6 percent for general education, 12.3 percent for the general language track, and 11.2 percent for the general mathematics track. For women, the returns to vocational secondary education are 2.5 percent, compared with 12.3 percent for the general language track, and 11.6 percent for the general mathematics track.

CHAPTER 4.

Challenges in Access and Equity in TVET

SECTION 4.1.
TVET Systems' Small Scale with Prospects for Growth

TVET systems in L/MICs are struggling to equitably provide sufficient access to vocationally-oriented learners, because even relatively small systems can still exclude many. Currently, most formal TVET systems in L/MICs are small and concentrated in upper-secondary education, but these systems can be expected to expand, particularly in LICs, due to demographic changes and rising rates of basic education completion. To prepare for expansion and to attract students who would benefit the most from their programs, however, TVET systems need to attract students regardless of gender, socioeconomic background, disability status, ethnicity, migration history, and any other factors that can be barriers to accessing TVET.

Formal TVET systems in L/MICs tend to enroll relatively few students, both compared to the number in corresponding levels of general education and to the relative size of TVET in high-income countries. Collecting TVET data is difficult (Box 4.1.), but, on average, the share of youth in TVET goes up with a country's income per capita. The average share of 15– to 24–year-olds enrolled in vocational education, formal or non-formal, is 1.1 percent in LICs, 4 percent in LMICs, and 7.6 percent in UMICs. This compares to 11.9 percent in HICs (Figure 4.1). One reason for the differences is that fewer youth in poorer countries stay in education of any type. Moreover, in HICs, more learners enroll in TVET than in general education.

There are significant regional differences in the magnitude of TVET systems, but these largely mirror income differences. The average share of 15–24-year-olds enrolled in TVET in L/MICs is far less than 10 percent in all regions except Europe and Central Asia. Figure 4.2 confirms that the share of youth in TVET is positively correlated with income. TVET enrollment is particularly low in Sub-Saharan Africa and South Asia, due to the low share of youth aged 15–24 enrolled in any type of education and, particularly for, to the low share of secondary students enrolled in TVET compared to general education.

BOX 4.1.
Data Sources and the Difficulties of Collecting TVET Data

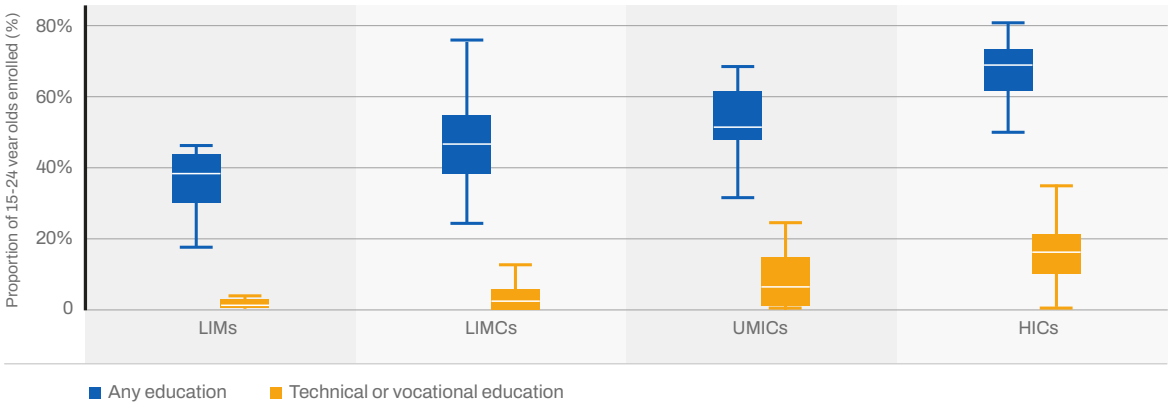
The main data on TVET are compiled by the UNESCO Institute of Statistics (UIS) from national sources, based on what countries report on SDG indicator 4.3.3—the percentage of youth aged 15–24 who participate in technical or vocational education. The data do not distinguish between participation in formal or non-formal education.

A second type of data deals with education levels—lower-secondary (ISCED 2), upper-secondary (ISCED 3), or post-secondary non-tertiary (ISCED 4)—and reports for each level the shares of students in vocational or general education. These data, however, have two main issues: (1) many values are missing, often because of under-reporting but also because countries provide entry points to TVET at different education levels; and (2) at the post-secondary non-tertiary level, collecting enrollment data is often complicated by the fact that responsibility for TVET is often split between different ministries.

Other sources of data include UNESCO-UIS country-level ISCED mappings, which classify education programs at different levels as general or vocational, and UNESCO-UNEVOC's International Centre's TVET Country Profiles, which give information on key statistics and features of TVET systems in different countries. Different data sources are often inconsistent.

Source: UNESCO Institute of Statistics (UIS), "UIS.Stat", http://data.uis.unesco.org/; UNESCO Institute of Statistics (UIS), "ISCED Mappings," http://uis.unesco.org/en/isced-mappings; and UNESCO International Centre for Technical and Vocational Education and Training (UNEVOC), "TVET Country Profiles," https://unevoc.unesco.org/home/TVET%20Country%20Profiles.

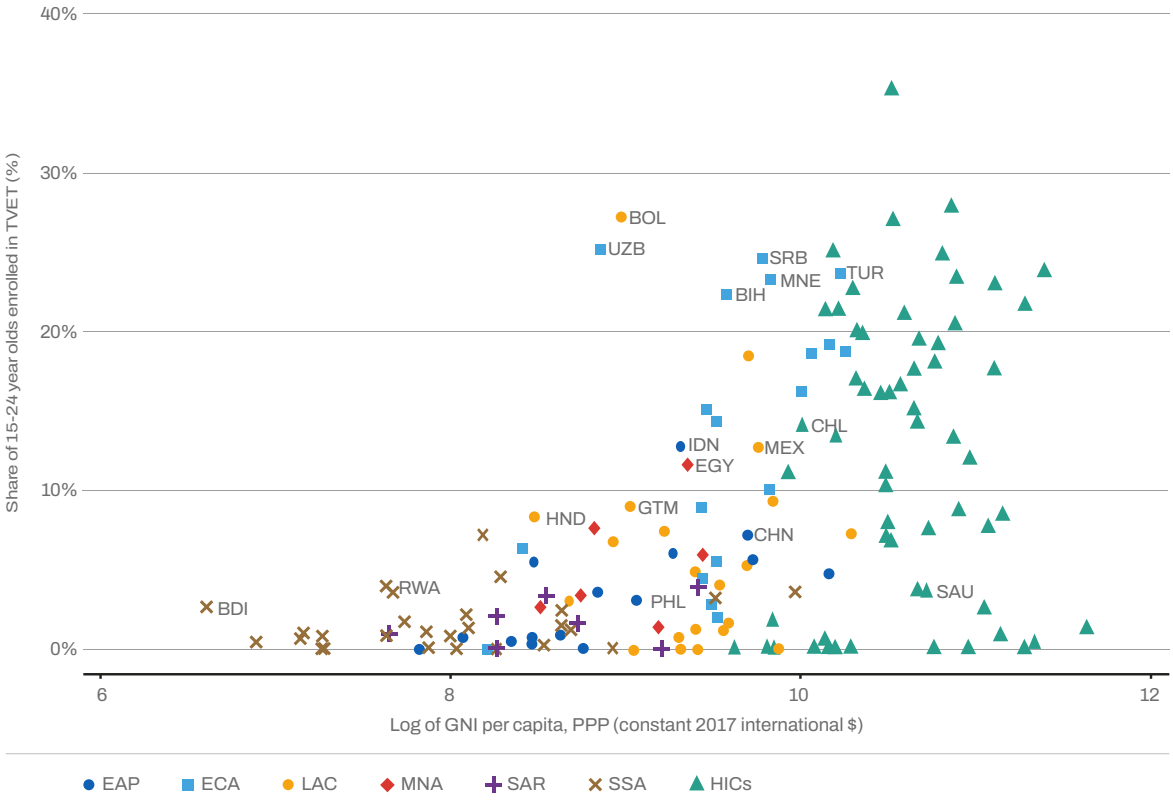
Figure 4.1: Participation of 15-24-year-olds in Vocational Education Increases with Countries' Income



Source: UNESCO Institute of Statistics & ILO Statistics, latest year available.

Note: The percentage of 15-24-year-olds enrolled in education was calculated by dividing the number of people 15-24 years old in education by the population of that age group in the country as provided by ILO Statistics. The line inside the box represents the median of the distribution. The lower end of the box represents the 25th percentile, and the upper end the 75th. The lines outside the box represent the highest and lowest values excluding outliers. Data restricted to countries with latest data point since 2011. Data points for enrollment are for 118 countries. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries, HICs = High–income countries. While the composition of countries in "any education" and "technical or vocational education" differs somewhat for each country group, the conclusion remains the same with the smaller sample of countries that have data for both variables.

Figure 4.2: Participation of 15–24-year-olds in TVET is Highest in Europe and Central Asia



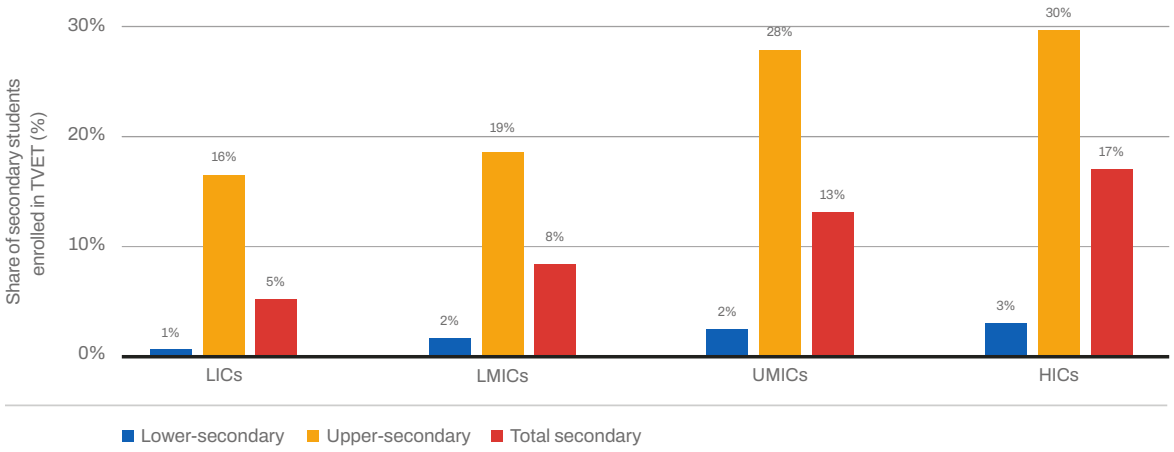
Source: UNESCO Institute of Statistics, latest year available.

Note: Data restricted to countries with latest data point 2011 or later. The World Bank income group classification is based on GNI per capita in current US$ (using the Atlas method exchange rates); the figure uses log of GNI per capita, PPP (constant 2017 international $) in the x-axis. EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa, HICs = High-income countries. See Appendix Table A.1 for country codes.

In countries of all income levels, TVET students make up a much larger proportion of learners in upper-secondary than in lower-secondary (Figure 4.3). In MICs, as in HICs, the proportion of TVET students in upper-secondary is 11– 12 times higher than in lower-secondary, partly because in many countries TVET does not start until upper-secondary. In LICs, the proportion of upper-secondary TVET learners is about 27 times the proportion in lower-secondary education. Participation of lower-secondary students in vocational programs is generally low (less than 5 percent), with a few exceptions, often in Latin America. For example, in Mexico about one in four and in Costa Rica about one in five lower-secondary students are in vocational programs. In upper-secondary education, substantially smaller shares of LIC students (16.3 percent) and L/MIC students (18.6 percent) are enrolled in TVET programs than UMIC (27.9 percent) and HIC students (29.6 percent).

There is significant variation within income groups. LICs, like Ethiopia and Rwanda, have similar or higher shares of students in upper-secondary as average HICs (Figure 4.4). Looking at regions, L/MICs in ECA have the largest share of upper-secondary students enrolled in TVET (43 percent), followed by LAC (28.4 percent), and MNA (17.9 percent); South Asia has the smallest share (5 percent).

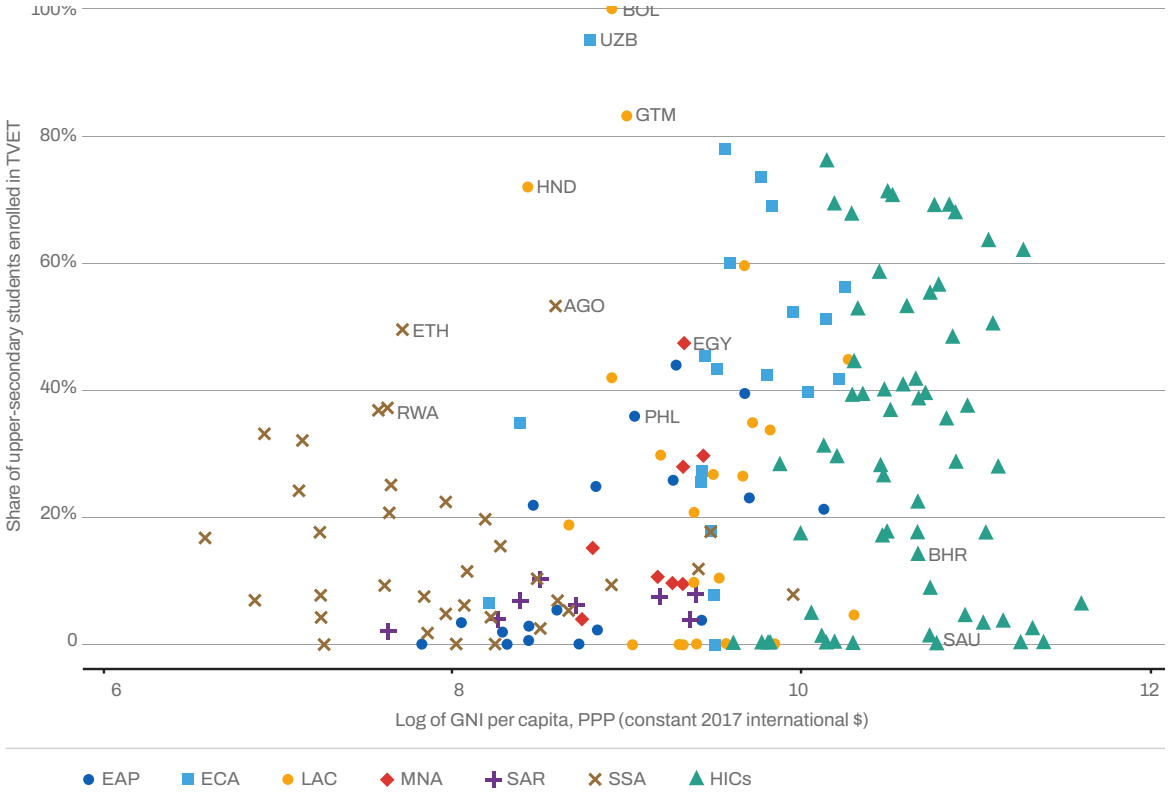
Figure 4.3: The Share of Secondary Students in a Vocational Track Increases with Countries' Income, Especially in Upper-Secondary



Source: UNESCO Institute of Statistics.

Note: Data restricted to countries with latest data point 2011 or later. Missing values treated as zeroes. Data points for lower secondary: 197 countries. Data points for upper-secondary and total secondary: 184 countries. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries, HICs = High–income countries.

Figure 4.4: There Is Large Variation Within Income Groups in the Share of Upper-Secondary Students in Vocational Programs



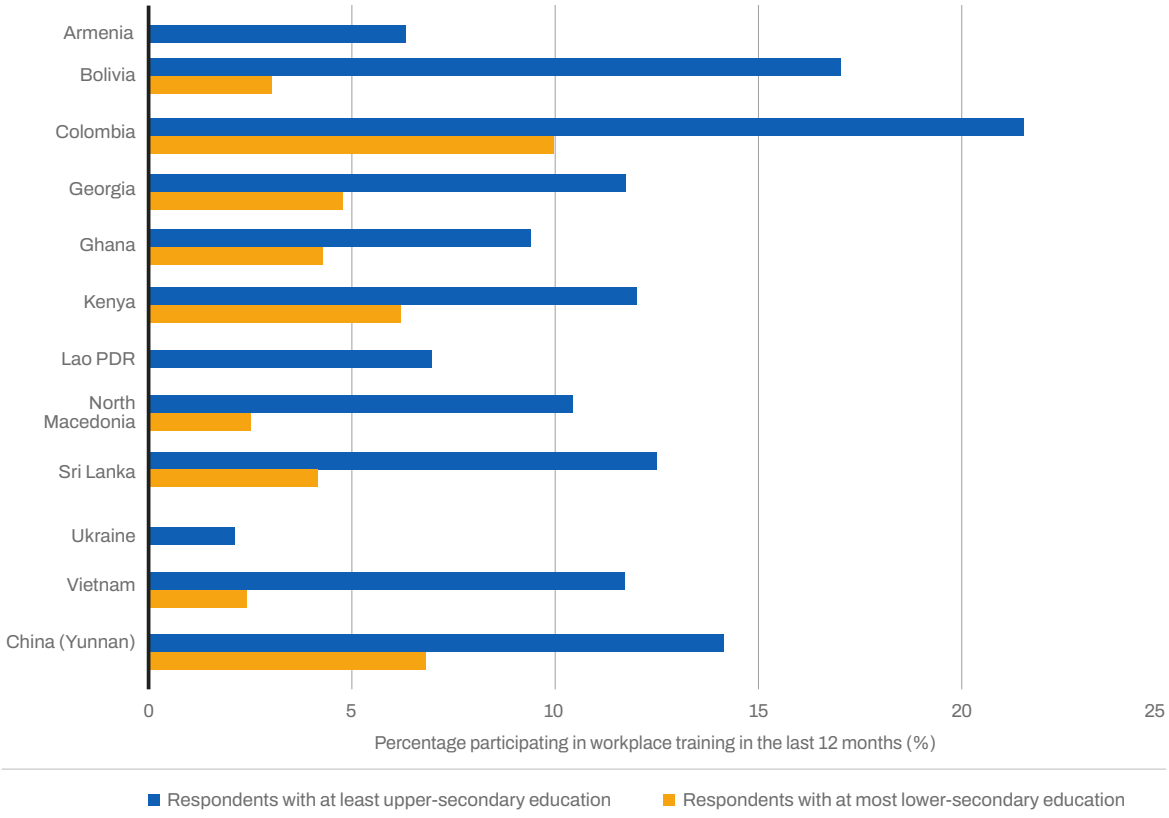
Source: UNESCO Institute of Statistics, latest year available.

Note: Data restricted to countries with latest data point 2011 or later. The World Bank income group classification is based on GNI per capita in current US$ (using the Atlas method exchange rates); the figure uses log of GNI per capita, PPP (constant 2017 international $) in the x-axis. Missing values treated as zeroes. EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa, HICs = High-income countries. See Appendix Table A.1 for country codes.

Not surprisingly, in many countries upper-secondary students make up the bulk of TVET learners. Of 39 L/MICs for which UNESCO-UIS data are available, more than half of all TVET learners were in upper-secondary. For a few countries, like Angola, Nepal, North Macedonia, Pakistan, and Serbia, more than 90 percent of all vocational learners were enrolled in upper-secondary. In most countries, post-secondary non-tertiary learners make up only a small share of all TVET learners; only in Jamaica and Turkmenistan were more than half of all vocational learners in post-secondary non-tertiary education.

There are no comparable data on formal continuing vocational education and training (CVET) for L/MICs and little is available even for individual countries, but only a very small proportion of the workforce undertakes formal TVET as part of upskilling and reskilling after entering the labor market. In L/MICs where data are available, the share of urban adults, especially those less educated, who participate in even non-formal training is very low (Figure 4.5). Formal training is most certainly even lower.This is not surprising: investment in workplace training, the most likely form of CVET, is low even in HICs: a study using detailed microdata for Portuguese firms that included specific information on training expenses found that the internal rate of return for investments in human capital by firms providing training was 17–24 percent, but despite these high rates of return, on average firms dedicated less than 1 percent of total work hours to training (Almeida and Carneiro 2009). The role of formal educational institutions in providing CVET seems to be quite limited even in European HICs (CEDEFOP 2019).

Figure 4.5: Participation Even in Informal or Non-formal CVET Is Low in Most Countries, Particularly Among Less-Educated Workers



Source: World Bank 2018a.

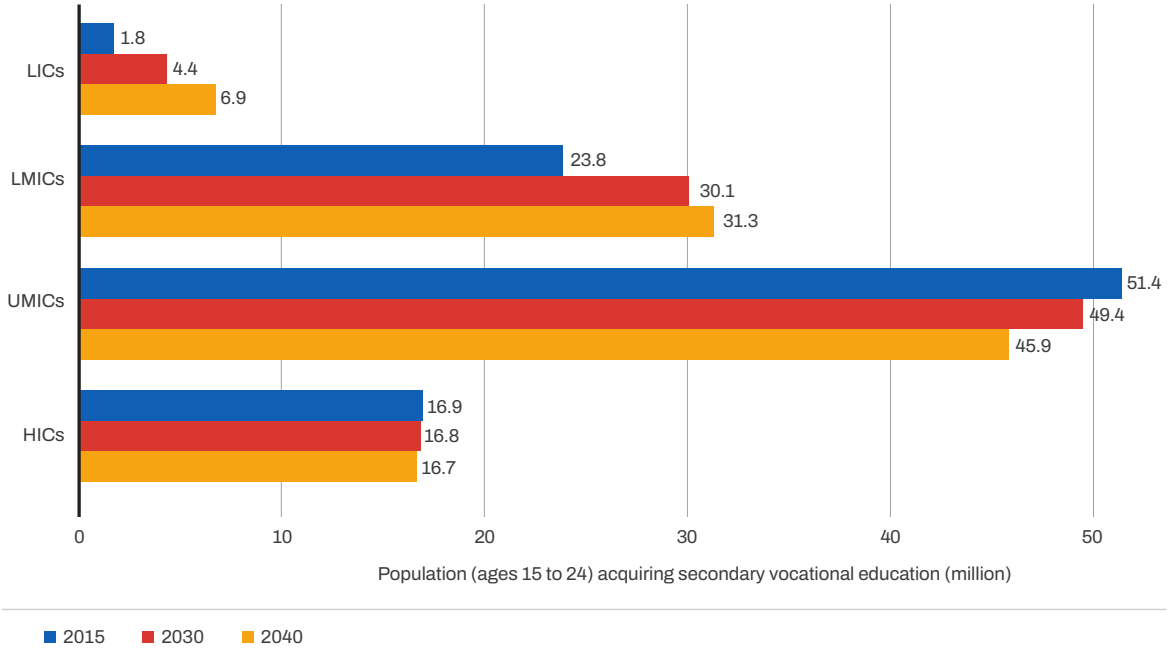
Note: Data from STEP Skills Measurement Programme (microdata.worldbank.org/index.php/catalog/step/about). Respondents were asked whether in the past 12 months, they had participated in any training courses not part of the formal educational system, such as work-related or private skills training, that lasted at least 5 days/30 hours.

While currently the formal TVET system in many L/MICs is relatively small, demographic trends and rising completion rates in primary and lower-secondary education imply significant expansion in coming decades, particularly in LICs. Between 1970 and 2020, TVET systems apparently shrank relative to general education in L/MICs. Based on data for 42 countries, the percentage of secondary students in TVET declined from 17 percent in 1970 to 11 percent in 2020. However, based on a larger sample from 72 L/MICs, the percentage of secondary students enrolled in TVET went up slightly, from 8.6 percent in 2000 to 11.3 percent in 2020.[12] Long-term trends are likely to lead to the expansion of TVET (Figure 4.6). Even if student preferences for general or vocational education do not change, in the next two decades the number of youths with TVET at the secondary level can be expected to more than quadruple in countries like Burundi, Liberia, Mali, Mozambique, Senegal, Tanzania, and Uganda and increase as much as six times in Sudan and ten times in Niger.[13]

12 Authors' calculations based on UNESCO Institute of Statistics. If data for reference years are missing, values for the closest year within five-year periods centered on reference years are used.

13 Authors' calculations, using methodology applied by Arias et al. 2019.

Figure 4.6: The Size of the TVET System Is Likely to Increase in LICs and LMICs



Source: Methodology based on Arias et al. 2019.

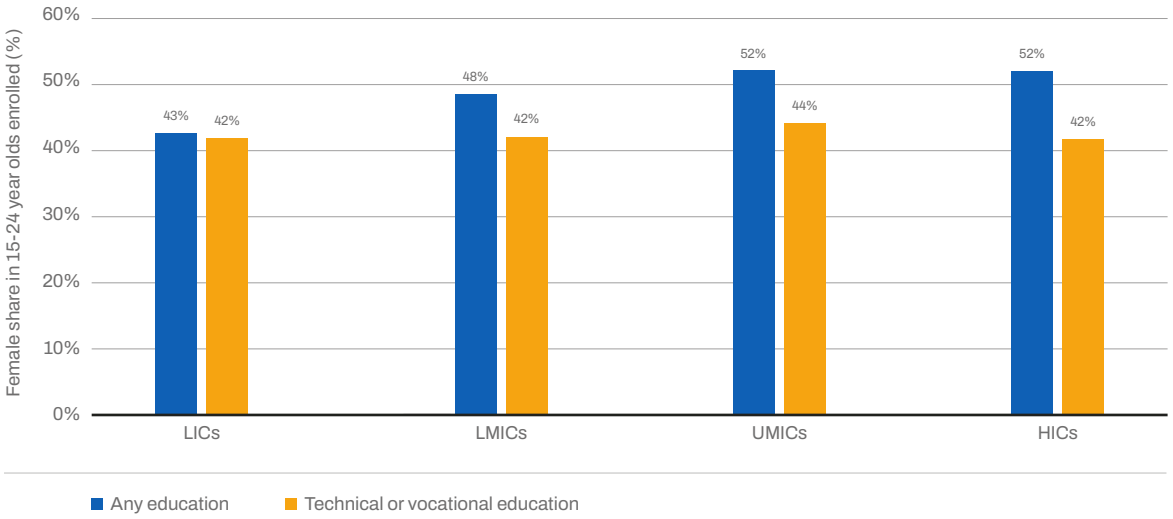
Note: Barro-Lee data are used for projections of education attainment by country and UNESCO Institute of Statistics data for the share of secondary students in vocational education. The population aged 15–24 acquiring secondary vocational education is calculated as the population with at least secondary education multiplied by the share of vocational students in secondary education. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries, HICs = High-income countries.

SECTION 4.2.
Male Dominance in TVET, with Striking Segregation by Field

As the TVET system expands, many countries will need to pay more attention to equity and gender equality. TVET is often male-dominated even where women are more likely to be engaged in education generally, as in UMICs (Figure 4.7A). Gender gaps exist in all regions, though they are widest in South Asia and East Asia and Pacific (Figure 4.7B). These averages mask some variation between countries within income groups. Only 14 MICs (of which 11 are UMICs, mostly in Latin America and the Caribbean) have a higher female share in vocational than in general education; a few LICs, like Burundi, Ethiopia, and Guinea also have higher gender parity in vocational than in general education. Countries in South Asia have some of the highest gender disparities for participation in vocational education: India has the lowest gender parity index for TVET participation, with women comprising only 10 percent of the students in vocational education.

Figure 4.7: Women Are Less Likely than Men to Enroll in TVET

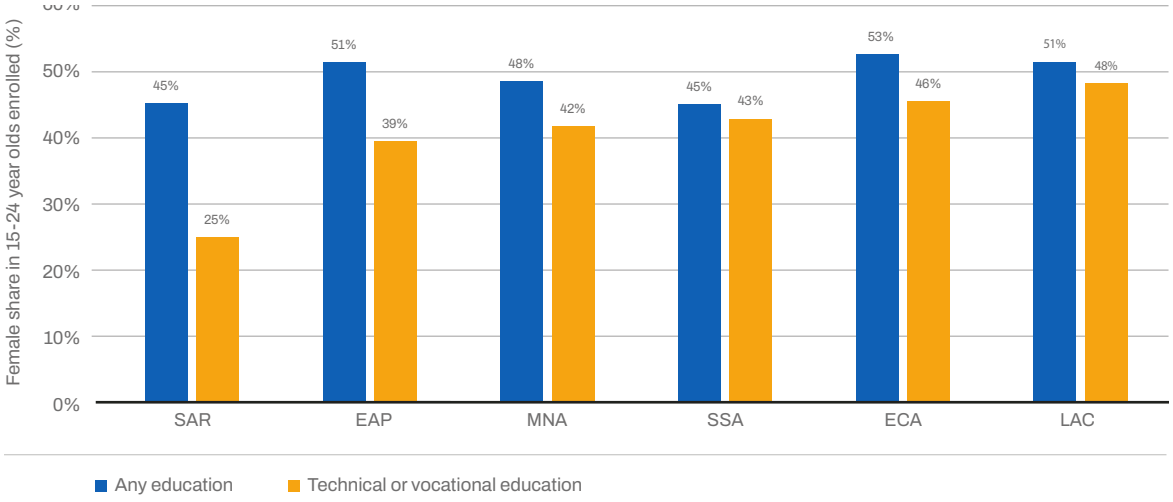
A) By country income group



Source: Data from UNESCO Institute of Statistics and ILO Statistics; latest year available.

Note: Covers L/MICs with latest available data for the period from 2011 to 2022. Data points for enrollment in general education for 147 countries. Data points for enrollment in vocational programs for 142 countries. While the composition of countries in "any education" and "technical or vocational education" differs somewhat for each country group, the conclusion remains the same with the smaller sample of countries that have data for both variables. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries, HICs = High-income countries.

B) By region



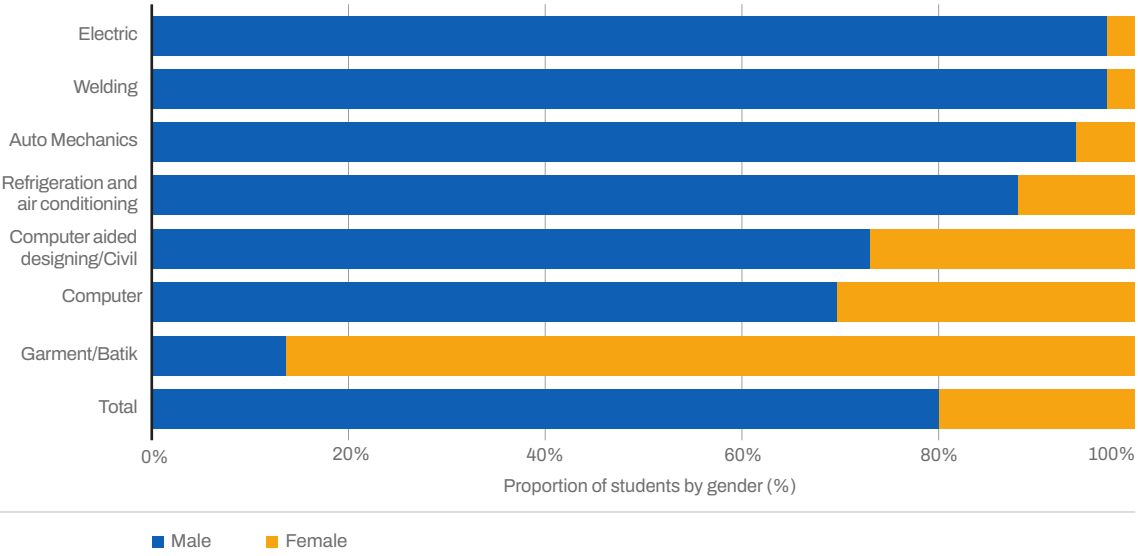
Source: UNESCO Institute of Statistics and ILO Statistics; latest year available.

Note: Covers L/MICs with latest available data for the period from 2011 to 2022, excludes HICs. Data points for enrollment in education for 110 countries. Data points for enrollment in vocational programs for 88 countries. While the composition of countries in "any education" and "technical or vocational education" differs somewhat for each country group, the conclusion remains the same with the smaller sample of countries that have data for both variables. EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa.

Gender disparities in TVET are most striking in certain fields of study. Nigeria had a 4 to 1 male-female enrollment ratio in technical colleges. The gender gap was particularly large in architecture, ICT, accommodation or food services, and mechanics—overwhelmingly male-dominated fields (World Bank 2015b). In Bangladesh, women made up 86 percent

of formal short-term training courses in garments but comprised less than 10 percent of those studying electricity, welding, and auto mechanics (Figure 4.8). Even in some Latin American countries where female participation in TVET is relatively high, women tend to be concentrated in traditionally female trades. For example, a study in Mexico found women comprising less than 30 percent of students in engineering and physical sciences but more than 50 percent of students in social and administrative sciences and health-related fields (Buquet Corleto and Moreno 2017). Similar gaps are also observed in Ecuador, among others (Munoz Rojas 2020).

Figure 4.8: Bangladesh: The Share of Women in Short-Term Formal Training Courses Varies Widely by Field of Study



Source: World Bank 2015a.

Note: Date are from a 2013–14 tracer study of randomly selected graduates from short-term training programs in TVET institutions.

Female TVET students are often severely underrepresented in science, technology, engineering, and mathematics (STEM), but not in all areas. In one of Ethiopia's technical and vocational colleges, for example, women made up only 10 percent of students in manufacturing and 23 percent in electrical fields. However, women made up 75 percent of students in food preparation and 100 percent in administrative office fields (Buehren and Salisbury 2017). Gender disparities can also differ significantly in STEM disciplines and subject areas. For example, at the University of Mining and Technology in Ghana, 11 percent of students in renewable energy engineering are female, compared to 35 percent in environmental engineering. In Jamaica, women were reported to be underrepresented in core STEM fields like engineering and computer science but overrepresented in STEM-related TVET fields like health and actuarial and applied science. In Lebanon, only 5 percent of students in the broad category of "industrial" TVET are female. Yet within this category, women are overrepresented in optometry, agri-food industries, and design and manufacture of jewelry (UNEVOC 2020).

Gender segregation in TVET fields of study matters for future earnings. In Uganda, a study found that women who cross over into male-dominated sectors make as much as men and three times more than women who stay in female-dominated sectors

(Campos et al. 2015). In Ethiopia, a similar study of entrepreneurs also found significant profit gaps along the same divisions (Alibhai et al. 2017). An analysis using data for 97 countries for enterprise owners, managers, and employees who use Facebook confirms this hierarchy of earnings: female-owned businesses in male-dominated sectors make 66 percent more profit than those in traditionally female sectors (Goldstein et al. 2019). This is a misallocation of talent; exclusion of women from TVET fields that are in high demand is detrimental to the economy (World Bank 2011).

Many of these gender differences in TVET stem from information failures and restrictive gender norms. Scholars have found problems caused by imperfect information about labor market returns of different occupations and fields of study. In Kenya, young women had imperfect information about the relative returns to vocational training in female- and male-dominated trades (Hjort et al. 2010). Similarly, such gender gaps have been linked to psychosocial factors regarding cultural norms about what women can and should do. Early in life such norms shape perceptions and influence aspirations and choices about education and employment, reinforcing the traditional perception of women as secondary earners and creating a vicious cycle through intergenerational effects (Campos et al. 2015; World Bank 2011). They are reflected, for example, in the disproportionate share of household and care responsibilities of women (Devercelli and Beaton-Day 2020). Barriers pushing female learners away from TVET, such as lack of gender-inclusive facilities and risks of gender-based violence and sexual harassment, are likely to be most severe in male-dominated fields and occupations (World Bank 2019a).

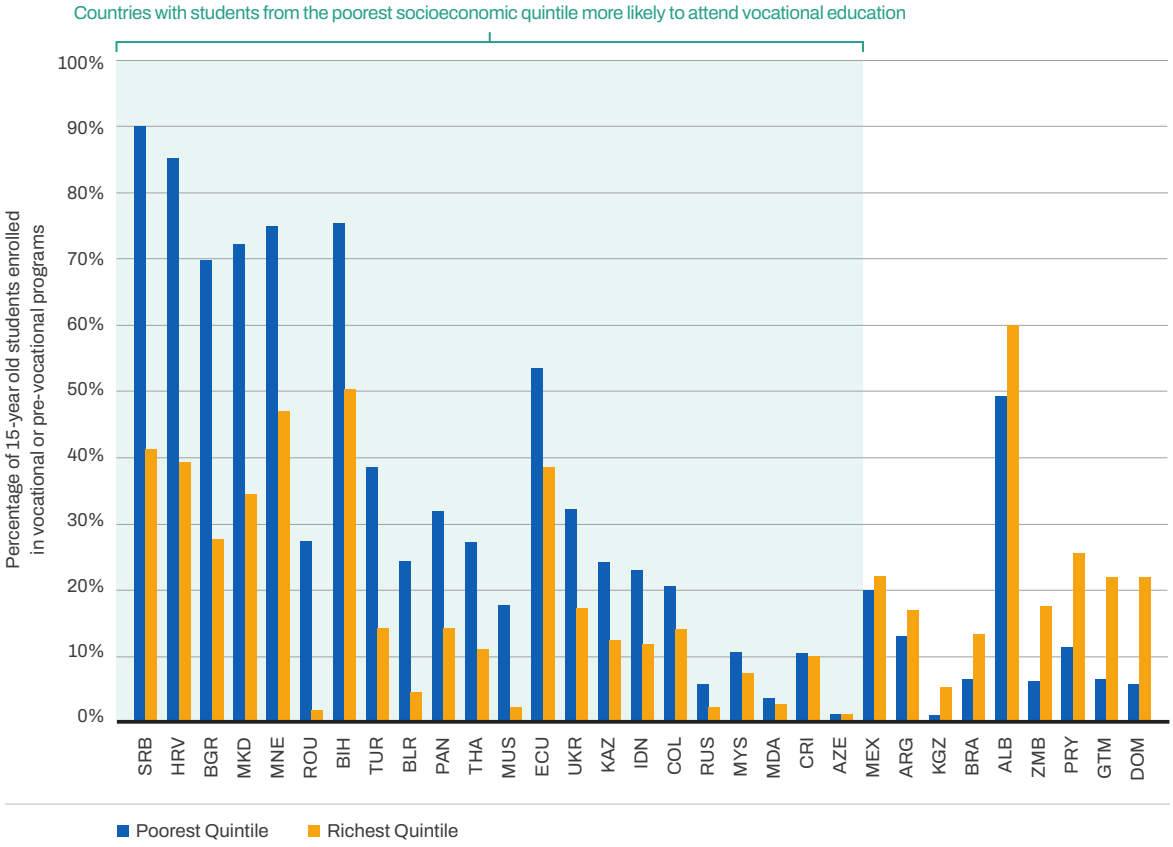
SECTION 4.3.
Prevalence of Lower-Income Students, but Not the Poorest

Beyond gender, there are also equity concerns related to the socioeconomic background. TVET students often come from lower-income households than their peers in general education, although not necessarily from the poorest of the poor, who often drop out of formal education before reaching the TVET entry point. Data from the OECD Programme for International Student Assessment (PISA) shows that in most countries, among 15-year-olds taking the test, secondary students from the poorest socioeconomic quintile are much more likely to attend vocational or pre-vocational programs than their peers from households in the richest quintile (Figure 4.9). Albania, Argentina, Brazil, the Dominican Republic, Guatemala, the Kyrgyz Republic, Mexico, Paraguay, and Zambia are exceptions in this pattern.

Even when controlling for demographic and educational characteristics, lower socioeconomic status is often associated with a higher likelihood of enrolling in TVET. In Ghana and Kenya, TVET students tend to come from families with lower socioeconomic status than those who attend general education, as proxied by the educational level of their parents (Figure 4.10). The evidence is similar for China

(Wang 2017). This issue is not unique to L/MICs; evidence from advanced European economies, with a tradition of stronger TVET systems, shows more socioeconomically disadvantaged students selecting into TVET (Kuzmina and Carnoy 2016).

Figure 4.9: Secondary School Students from the Poorest Quintile Are Often More Likely to Be in Vocational and Pre-Vocational Programs than Their Peers from the Richest Quintile



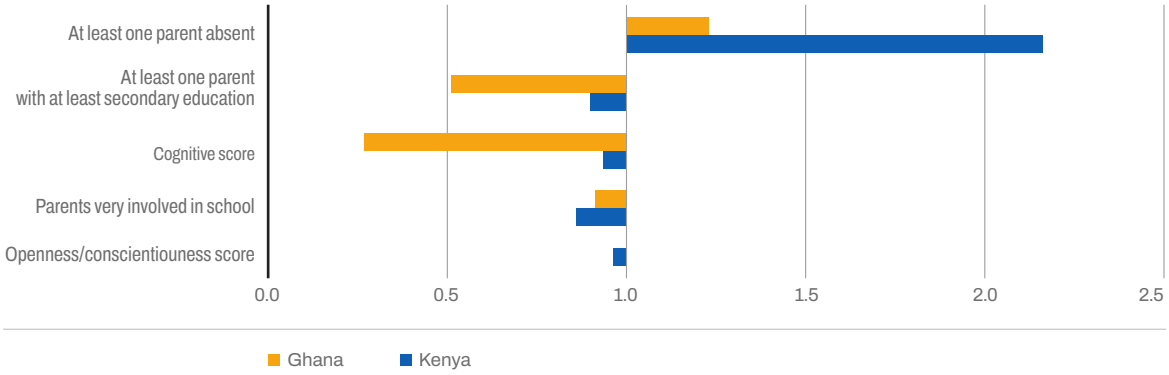
Source: Data from PISA 2003, 2006, 2009, 2012, 2015, 2017 (PISA-D) and 2018.

Note: Socioeconomic status defined using the OECD Index of Economic, Social, and Cultural Status, a composite measure of parental education, parental occupation, and household assets. Data sorted by gap between poorest and richest quintiles in the share of students attending vocational education. See Appendix Table A.1 for country codes.

Like gender, socioeconomic status can affect not only entry into TVET, but also the choice of specialization. In Bangladesh, students in short-term training from the richest income quintile and those with better educated parents were more likely to be enrolled in ICT or computer-aided design trades; students from the poorest quintile and those whose parents were less educated were more likely to choose welding, electric, and auto mechanic courses (World Bank 2015a).

Figure 4.10: At Least in Some Settings, Socioeconomic Characteristics Partly Determine Selection Into TVET

Odds Ratios of the Probability of Attending Secondary-Level TVET versus General Secondary



Source: Arias et al. 2019. Based on Skills Towards Employability and Productivity (STEP) Household Surveys.

Note: Estimates from a multilogit regression controlling for gender, if student started first grade at 7 or older, age cohort, language, and number of siblings at age 15. The cognitive score and the socioemotional score (openness - conscientiousness) are measured in standard deviations. The figure represents odds ratios, in this case the ratio of the probability of attending secondary-level TVET over general secondary. If the ratio equals 1, there is no difference in the probability between the two tracks; positive values reflect factors associated with a higher probability of enrollment in TVET and vice versa.

TVET learners may have multiple, interrelated disadvantages that, in addition to gender and socioeconomic status, may include, e.g., ethnicity, migration history, and disability. Concerning inclusion of learners with disabilities, in many L/MICs TVET institutions are often not equipped to enable inclusive access, and teachers are ill-prepared and lack the materials to cater to the needs of learners with special educational needs. In some countries, like Bangladesh, special TVET institutions exist for learners with disabilities. However, segregated training opportunities may negatively affect these learners' integration into regular workplaces (UNESCO-UNEVOC 2021).

That TVET is the de facto track for the relatively disadvantaged means that it is important to understand barriers to entry into TVET for this group. Segmentation based on socioeconomic background is in significant part the result of negative perceptions about TVET that dissuade many better-off, better-prepared learners from enrolling. Anecdotal evidence suggests that there is a general view among employers and the broader public that a significant part of TVET is low quality (UNESCO-UNEVOC 2018). TVET is seen as a choice inferior to general education in many countries, based on either real or perceived differences in educational quality, opportunities for continuing education upon graduation, and employment prospects. This makes general education a preferred alternative especially for learners with social and financial resources. The sorting of academically weaker and more disadvantaged students into TVET also feeds into negative perceptions, creating a vicious circle.

First, there are barriers to completing preceding levels of education. While TVET often enrolls students from more disadvantaged households than those in general education, the poorest of the poor often do not enroll in secondary school and so are left out of TVET, general secondary, or higher education altogether. From 2000 to 2019, the number of out-of-school children of lower-secondary-school age shrank from 99 million to 61 million, and the number of out-of-school children of upper-secondary-

school age fell from 177 million to 137 million.[14] Still, many children do not reach the level of education where TVET starts, especially in LICs. In nearly every country, parental wealth and educational attainment are the main determinants of children's education (World Bank 2018a). Stark differences also exist based on gender, disability status, ethnicity, or location. In addition to direct and indirect costs, parental decisions to invest in their children's education also hinge on the distance to schools (especially for girls) and the perceived benefits of education, which are determined by family perceptions about education quality, potential returns to education, and the child's learning ability (World Bank 2018a).

Second, the often-limited supply of TVET tends to be concentrated in economic centers, to which more disadvantaged students have less access. TVET in rural and remote areas tends to be less adequate and less diverse than in more urban areas (Afeti 2018). For example, in Kenya, for a youth employment program, public and private TVET provision was limited outside cities, and the program had to bundle different types of locations into contracts to attract providers and allow for cross-subsidization of services. In South Africa, compared to urban institutions, rural ones are less able to present a range of program options to students and had weaker infrastructure and fewer teaching facilities and staff (Papier et al. 2019). Just as in the rest of the education system, attracting teachers to remote locations can also prove difficult (Bruns and Luque 2015; Mulkeen and Chen 2008). This is likely to be even more difficult in TVET in part because teachers are more specialized and require industry experience (Kennedy et al. 2017; Tshabalala and Ncube 2014). It is often challenging to recruit teachers from rural communities who have suitable training and industry experience, as has been seen in, e.g., Brazil, India, and Kenya (UNESCO 1997). And it is difficult to attract teachers from elsewhere, because of the lower social status associated with rural deployment, distance from family and friends, fewer amenities, and a lack of mitigating incentives (Axmann et al. 2015). And providing adequate professional development for TVET teachers in rural communities is an additional logistical and financial challenge (Axmann et al. 2015).

Third, disadvantaged students can have liquidity and credit constraints that affect TVET enrollment and completion. In Kenya, fees at the least expensive public TVET institutions represent an estimated 15 percent of annual household expenditures per capita (Arias et al. 2019). Two-thirds of the training institutions surveyed in three cities in Kenya reported that inability to cover tuition was the most common reason for students to drop out (World Bank 2017a). TVET learners may also be more vulnerable to negative individual or aggregate shocks. In China, for example, even after controlling for major socioeconomic and demographic factors, students attending vocational high schools had higher dropout rates than students in general secondary programs, and this was only partly explained by students having found work before graduation (Loyalka et al. 2016). Similarly, in Romania, the inability to afford vocational education was the second most important reason (reported by 23 percent of institutions surveyed) for vocational students dropping out (World Bank 2023). The response to the COVID-19 pandemic is a case in point: more disadvantaged learners were less likely to have internet access,

14 https://data.unicef.org/topic/education/secondary-education/.

learning devices, and the conducive home environment necessary for remote learning, and they were less likely to be able to afford study delays associated with school closures and postponed apprenticeships (ILO et al. 2021).

Fourth, information constraints, which often disproportionately affect the most vulnerable students, shape the choice of field of study and transition into the labor market. Learners' beliefs about returns to TVET and their probability of being admitted in specific programs can be too optimistic because of inadequate access to information and career guidance. In Kenya, for example, survey respondents believed that the average increase in earnings associated with training is 65 percent higher than the actual estimate (Hicks et al. 2011). Returns to education and training were similarly overestimated in Moldova (World Bank 2016d) and the Republic of Congo (Gassier et al. 2022). Learners are also often mistaken about the highest-earning trades (Hicks et al. 2011). A relative lack of role models and networks may partly explain the misconceptions. In the Dominican Republic, the information youth had about the relative returns to secondary schooling and to different occupations was very wrong, and these perceptions were highly influenced by what they saw in their neighborhoods (Jensen 2010). In many cities and towns in L/MICs the poor and the rich have very separate lives, which is likely to bias youths' expectations and decisions.

TVET segmentation is bad for the system, for learners, and for the economy. TVET today is still a relatively attractive path for many learners who are less well-off or have other disadvantages that prevent them from attending the high-quality general education institutions that cater to richer, better-prepared students. But this segmentation has major costs: talented students leave the education and training system too early or end up in a track that does not fit their aptitudes and meet their aspirations. Increased repetition and dropout rates reduce system efficiency; and the whole economy suffers from the misallocation of talent.

CHAPTER 5.

Quality and Relevance Challenges: Multiple Barriers to Excellence

Reforms to expand initial or continuing TVET need to be supported by investments in its quality and relevance. Since 2017 Brazil, for example, has been implementing an extensive reform of upper-secondary education. One goal is to triple 2014 initial TVET enrollment by 2024 (OECD 2022). Many other countries also want to expand TVET to respond to current and future education and labor market needs. But expansions will not deliver on their promise if not coupled with reforms that address the highly complex and interrelated quality and relevance TVET problems of many L/MIC systems.

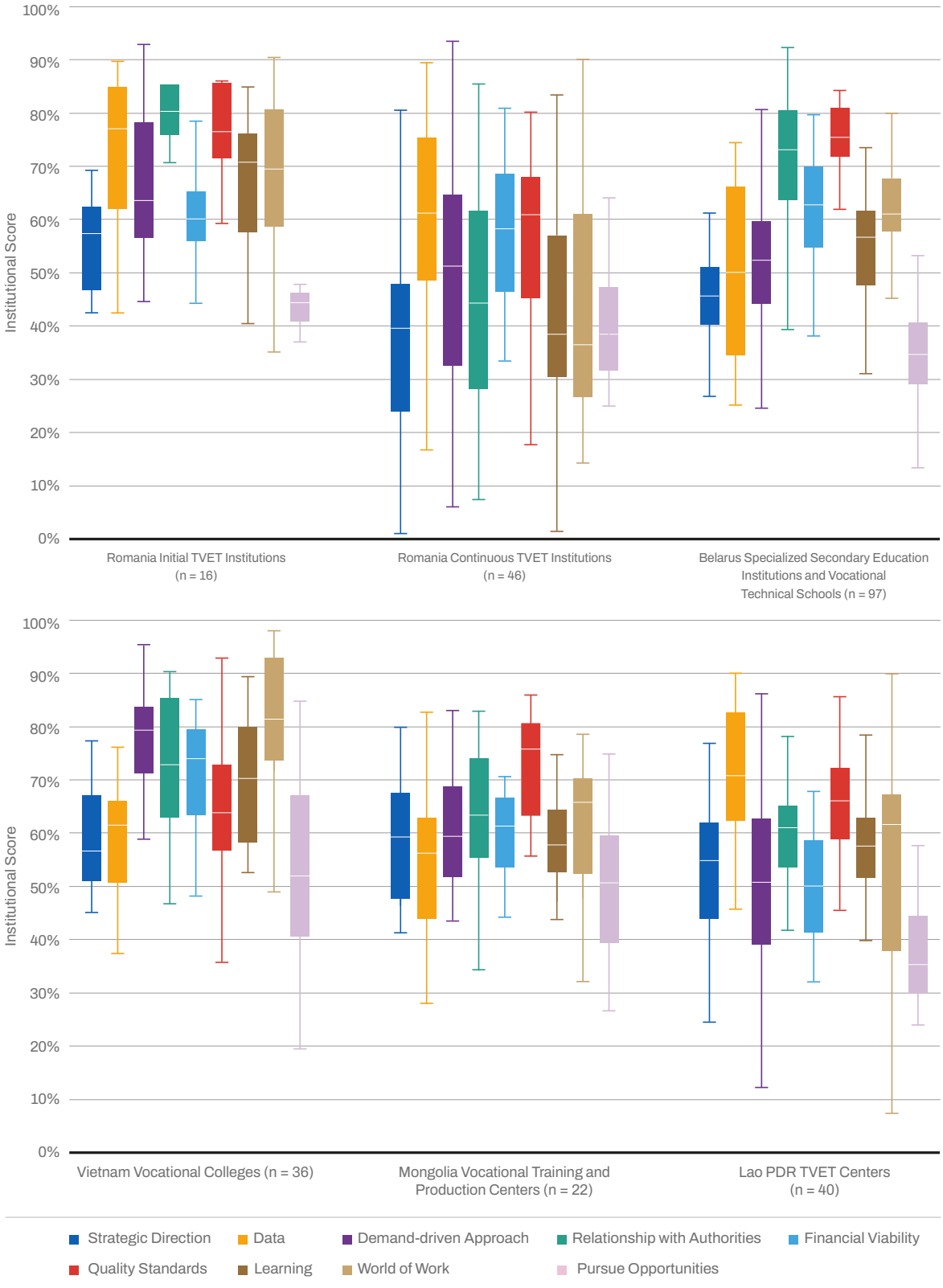
High variance in the labor market returns to TVET in L/MICs points to quality and relevance challenges. As shown earlier, some TVET programs and systems deliver quality and relevant skills to their students, enhancing their employability; others do not. The variance in returns to TVET within fields of study further suggests that its quality and relevance depend not only on system-wide factors but also on the quality of providers. The World Bank Training Assessment Project (TAP)[15] assessed TVET providers in seven countries or jurisdictions in the East Asia and Pacific region, five countries in the Europe and Central Asia region, and one country in Sub-Saharan Africa; while there were some similarities in reported provider practices, there was marked variation in how institutions manage and carry out a demand-driven approach to training, fulfilling quality standards, creating a teaching experience conducive to learning, and preparing students for the world of work.

Within countries, there is considerable variance in institutional performance on such issues as the extent to which training is demand-driven and how well the program prepares students for the world of work. For example, in Belarus and Romania, institutions showed the highest variation in developing a demand-driven approach to training and in gathering and publicizing data for informed decision-making. In Romania initial TVET institutions also varied substantially in the extent to which they connect students to the world of work, and the heterogeneity is particularly apparent among CVET institutions (Figure 5.1). For countries in East Asia and the Pacific, the largest variance in performance appears in the extent to which institutions enable students to pursue further education and how they approach quality standards (Vietnam), gathering, analyzing, and publicizing data (Mongolia), and preparing students for the world of work (Lao PDR).

This variation in performance across TVET institutions is problematic. For prospective TVET learners with little information on institution-specific returns, this high variation carries considerable investment risk. For employers, it makes it harder to assess job candidate competencies, so they may choose to rely on other proxies in hiring; it can also make them reluctant to hire TVET graduates altogether or, given the uncertainty, to pay them less. For the TVET system, such inefficiencies are troubling.

15 See Annex 3.2 for details on TAP scope and methodology.

Figure 5.1: There Is Large Variation in Performance Among Similar TVET Institutions Within Countries



Source: World Bank Training Assessment Project (TAP) data.

Note: The figure shows institutional scores on the action areas. Scores up to 25 percent indicate that the institution may be at a latent degree of practice, suggesting the need for significant reforms. Emerging practice is indicated by a score of 26–50 percent, indicating that in that area the institution has some elements of the action area aligned to global good practice to build on. Established (51–75 percent) and Advanced (76–100 percent) reflect institutional practices better aligned with global good practice. The bottom of the box is the 25th percentile and the top the 75th. The horizontal line is the median value. The vertical line denotes minimum and maximum values (within 1.5 times the interquartile range of the value at the 25th and the 75th percentiles). "n" denotes the number of observations.

The observed variations and weaknesses seen in TVET quality and relevance in L/MICs are the result of systemic, institutional, occupational, and individual factors related to what is taught, how teaching takes place, and who the main clients of TVET systems are.

SECTION 5.1.
Inadequate Foundational and Technical Skills

Inadequate Foundational Skills

TVET students in L/MICs often have weak foundational skills, defined as basic literacy and numeracy plus socioemotional skills like openness, perseverance, and teamwork (Arias et al. 2019; World Bank 2019b). In Algeria, Azerbaijan, Georgia, Mauritius, and Senegal, fewer than 1 in 10 students in secondary vocational or pre-vocational programs is functionally literate—able to achieve the minimum proficiency in reading on PISA.[16] Secondary TVET graduates in Ghana score almost 4 standard deviations below general secondary graduates on a literacy test arguably because of both pre-entry differences in foundational skills and general education doing a better job of improving these skills (Arias et al. 2019).

Students in L/MICs often already have weak foundational skills when they enter TVET. In the majority of 35 L/MICs participating in PISA, 15-year-old secondary students in vocational or pre-vocational programs performed worse than their general secondary peers in foundational skills. In some countries, the gap in foundational skills is astonishing: for example, in Romania, while 60 percent of students in general secondary perform above minimum proficiency in mathematics, only 16 percent of students in vocational secondary programs do so (Figure 5.2).[17] Similar patterns are observed for reading skills, and, notably, for the important socioemotional skill of growth mindset, or the belief that someone's ability and intelligence can be developed over time. In most L/MICs that measured students' growth mindset in the PISA 2018 assessment, vocational and pre-vocational students were less likely to have a growth mindset (Figure 5.2B).

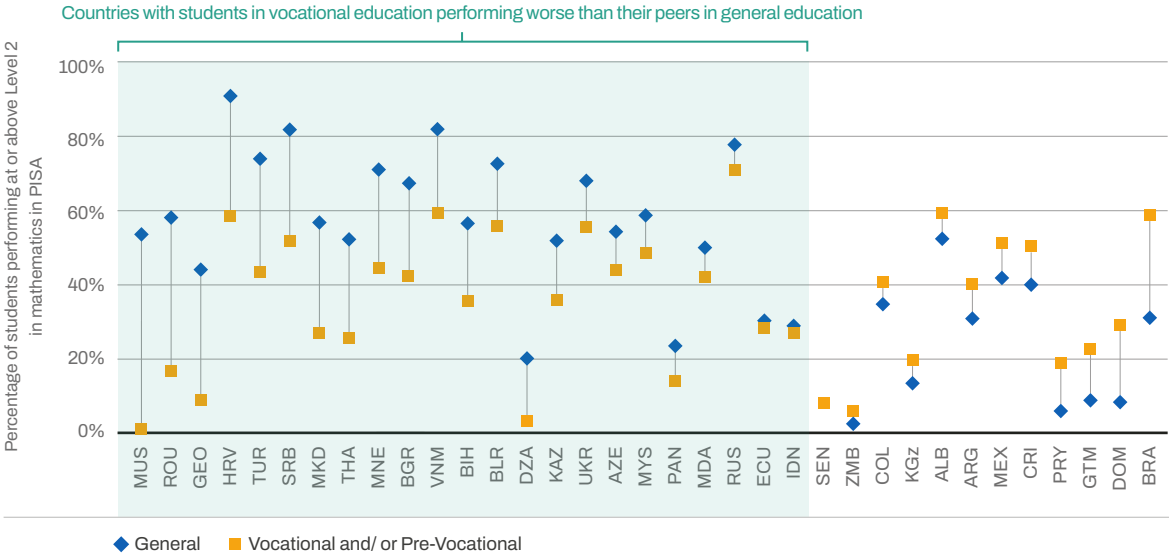
As shown in an earlier study, this negative relationship between performance on PISA and being in technical as opposed to general secondary remains even after controlling for several other factors, including socioeconomic status (Altinok 2011). But this relationship is complex: in the same study, while students from better-off households in vocational schools performed better than similar students in general education, the reverse was true for students from more disadvantaged backgrounds. This result echoes what was discussed in chapter 3: TVET can be a better fit for some learners than for others.

16 Data from PISA 2003, 2006, 2009, 2012, 2015, 2017, and 2018; authors' calculations.

17 There are exceptions: in 11 L/MICs (of which 8 are in LAC, among them Brazil, Costa Rica, and the Dominican Republic), vocational students had higher foundational mathematics skills than their peers in general secondary.

Figure 5.2: Students in Secondary Vocational and Pre-Vocational Programs Generally Lag in Foundational Mathematics Skills and Growth Mindset Relative to Peers in General Education

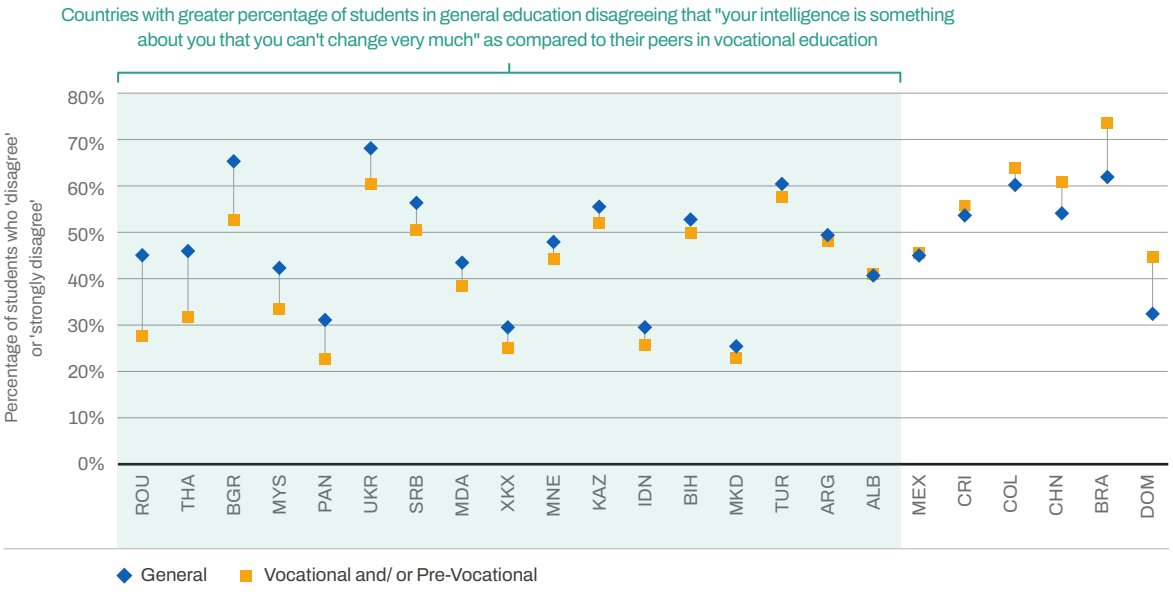
A) Mathematics



Source: Data from PISA 2003, 2006, 2009, 2012, 2015, 2017, 2018.

Note: Basic proficiency is defined as Level 2 in PISA. Countries sorted by the gap in proficiency between vocational/pre-vocational and general students. Results are similar for reading. See Appendix Table A.1 for country codes.

B) Growth Mindset



Source: Data from PISA 2018; OECD 2021d.

Note: Because disagreeing with the statement "Your intelligence is something about you that you can't change very much" is considered a precursor of a growth mindset, students who disagreed with the statement are considered to have a stronger growth mindset than students who agreed with it. Countries sorted by the gap in disagreement with the statement between vocational/pre-vocational and general students. See Appendix Table A.1 for country codes.

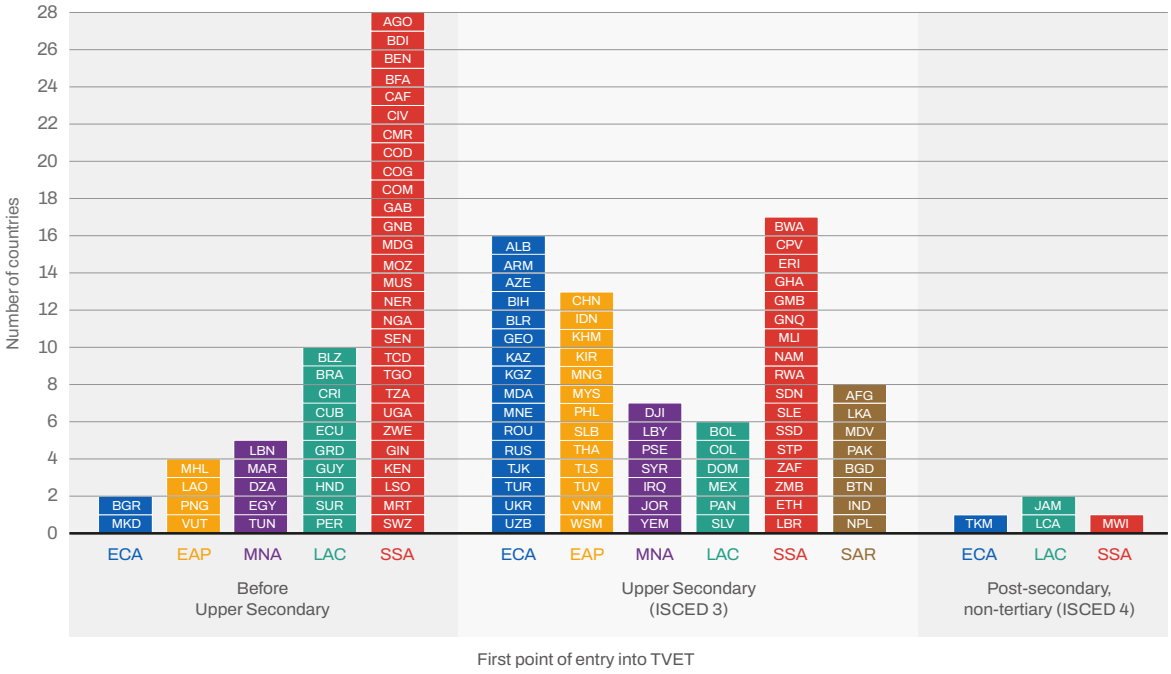
More recent data for individual countries also indicate that TVET learners have weaker foundational skills. In post-secondary TVET in Egypt, students entering technical colleges are mostly general upper-secondary graduates who failed to gain admission to university (Alvarez Galvan 2015). In South Africa, struggling students select into TVET: failing a secondary school grade is associated with a 40 pp decline in the probability of enrolling in a further academic program but enrollment in vocational programs is largely unaffected (Pugatch 2014). Scoring one standard deviation higher on a literacy test is associated with a lower probability of being enrolled in TVET (compared with general education), 75 percent lower in Ghana and 10 percent lower in Kenya (Arias et al. 2019). The evidence for China is similar (Wang 2017).

This sorting of "weaker" students into TVET, whether voluntary or forced, takes place in HICs as well. A study covering Austria, Croatia, and Hungary, countries where students can enter TVET in 9th grade, also found that students in TVET—even after controlling for socioeconomic characteristics—do worse on standardized math, science, and reading tests in 10th grade. However, in those countries TVET does not necessarily amplify the gaps in learning outcomes in the short term: within one year of track selection, students showed the same degree of learning progress on foundational skills—math, science, or reading—as their counterparts in general education (Kuzmina and Carnoy 2016).

In some L/MICs, it is possible to enter TVET at the lower-secondary level, which may not leave enough time for students to build the necessary base of foundational skills. In general, while entry into TVET in most L/MICs starts in upper-secondary, in 49 countries, TVET starts at lower-secondary (ISCED 2). According to UNESCO ISCED mapping for each country, a student can access a vocational track at lower-secondary in most countries in Sub-Saharan Africa and LAC (Figure 5.3). Having narrow vocational fields in lower-secondary may be less of an issue when primary education is of high quality or when TVET programs can impart foundational skills well, but it may be too early in countries where large numbers of students do not acquire strong foundational skills by the end of primary or even secondary education. Indeed, average learning outcomes are very weak in many LICs, but many MICs also lag far behind in the acquisition of foundational skills (World Bank 2018a).

Foundational skills are likely to be particularly weak among students of poorer backgrounds. In Argentina, for example, half of low-income students in the last two years of public secondary TVET institutions scored below the basic math level in national Aprender tests in 2016 compared to less than a quarter of students from high-income households (CENEP 2017). This pattern is echoed globally across the education system (World Bank 2018a). When vocational education does not effectively support development of foundational skills, individual learners and the economy lose as the labor market increasingly rewards skills that facilitate adaptability and respond to changing needs arising from technological change and the green transition.

Figure 5.3: In Many L/MICs TVET Starts Early



Source: UNESCO Institute of Statistics data (http://uis.unesco.org/en/isced-mappings).

Note: Odds Ratios of the Probability of Attending Secondary-Level TVET versus General Secondary See Appendix Table A.1 for country codes.

Because skills beget skills, when TVET students lack foundational skills at entry, it undermines their capacity to learn and upgrade other skills, such as the technical and vocational skills that TVET aims to develop. Cognitive, technical, and socioemotional skills are complementary (Psacharopoulos 1994). A large study in China found that in post-basic education TVET students make much smaller academic achievement gains than their peers in the general track (Loyalka et al. 2016). An experiment in Kenya's agriculture sector found that 12–17 percent of the variation in maize yields was explained by variation in farmer skills, with part of the impact of cognitive and socioemotional skills materializing through their intermediation of the accumulation of technical skills related to farming (Laajaj and Macours 2017). The importance of foundational socioemotional skills for agricultural productivity was also demonstrated in Malawi, where female farmers with greater perseverance were significantly more likely to adopt a cash crop and acquire specific knowledge on how to grow and sell that crop (Montalvao et al. 2017). The failings of basic pre-TVET education to develop adequate foundational skills hurts the employability of graduates but also poses a major challenge to the TVET system: when there is no remediation of foundational skills within TVET, learners' ability to acquire knowledge and skills from TVET can be severely hampered.

Weak foundational skills can also affect the efficiency of the TVET system in other ways. TVET curricula can be quite demanding, potentially leading to demotivation and early dropout of learners with weak foundational skills. Because TVET programs are tasked to provide both work-specific skills (through both classroom and practical training) and foundational skills, the curricula can be challenging for many learners,

especially those who did not acquire strong foundational skills in basic education. The combination of challenging curricula and challenged learners could undermine individual performance and retention and reflect on system performance, a point to which we will return in discussing quality.

Yet while there may be agreement about the importance of strengthening the foundational skills of TVET students, there can be major trade-offs in doing so. It has proven difficult for TVET to adequately and systematically support the development of foundational skills in TVET (Brewer and Comyn 2015; UNESCO 2015; UNESCO 2014a). Even when foundational skills are nominally incorporated in qualifications or curricula, actual skills delivery may falter due to inadequacies related to, for example, responsibilities for imparting these skills; effective integration of foundational skills in curricula, which ensures that curricula are not too heavy and rigid; adequate classroom practices and teacher capacity; institutional management; and assessment and reporting arrangements (UNESCO 2014a; Smith and Comyn 2003). Foundational skills are, by definition, transferable across firms, occupations, and sectors, thus reducing incentives for individual enterprises and sector organizations to invest in them. While this would justify focusing on the acquisition of foundational skills during formal, pre-service TVET rather than during on-the-job training, it is not always clear to what extent employers emphasize the need for this (Comyn 2005).

Inadequate Provision of Technical Skills

In addition to poor foundational skills, the technical skills that TVET students learn in L/MICs are not always well aligned with the current and future needs of the labor market, partly due to limited enrollment in fields with adequate job prospects. For example, in Argentina (Alvarez et al. 2015) and Türkiye (Mahmut and Suna 2020), most TVET graduates are employed outside their field of study. On the supply side, TVET systems can be slow to increase enrollment capacity in fields that offer the best job prospects and reduce it in fields with low returns. This can happen for a variety of reasons, ranging from lack of information on which fields offer the best job prospects, the time needed to increase the capacity of teachers and infrastructure, the administrative burden imposed by highly centralized and bureaucratic systems, and reform resistance and system inertia (Juntos por la Educación et al. 2013). On the demand side, TVET learners may not opt for fields offering the best job prospects. This can occur when learners lack information about the expected labor market outcomes, or when considerations other than job prospects play a stronger role in decision-making, such as individual preferences, perceptions, aptitude, social norms, and costs. In Moldova, for example, learners surveyed indicated that expected labor market opportunities are central to their education choices, but that they lack information to support their decision-making. The information gaps were largest among learners with less-educated parents, exacerbating inequality of opportunity due to suboptimal educational and career decisions (World Bank 2016d).

Relevance is also an issue within fields of study, when curricula are not aligned with the skills needed in the jobs for which TVET programs are preparing students. Curricula cannot reflect labor market demand when there are no effective mechanisms to regularly gauge what skills are needed in particular occupations. Even when such

information is collected regularly, it is sometimes not used to adjust the content of TVET programs, for example when training providers and their managing authorities lack incentives, capacity, or funds; or when regulations prevent them from adjusting their programs to local skills demand. A review of selected qualifications in 26 countries, including 10 L/MICs, found that about a quarter had been issued at least 10 years before the study, raising questions about their current labor market relevance (UNESCO and CEDEFOP 2017). As a concrete example, in Moldova, only one in five institutions providing short term training uses occupational standards determined by a professional association, and although three quarters of the institutions sampled had designed or adapted curricula relatively recently, only about a third considered employer needs in making these changes (World Bank 2018b).

While labor markets in L/MICs have been increasingly demanding digital skills, TVET systems have been slow to respond, as demonstrated by the challenges experienced during COVID-19. Technological progress has made basic digital literacy a core element of the skillset required for most occupations (World Bank 2016). Yet there are significant differences in the availability of digital skills between and within countries. A 2017 survey of 52 economies found the share of the population with basic and standard digital skills in developing countries to be approximately 20 percentage points lower than in advanced economies (International Telecommunication Union 2018).[18] The scarcity of digital skills among both students and teachers in TVET systems was exposed by the COVID-19 pandemic, where weak digital skills were the second most-reported constraint to engaging in distance learning, after the absence of appropriate equipment and internet access (ILO et al. 2021).

Even when TVET learners pursue specializations in information and communication technology (ICT), they often do not acquire the necessary digital skills: in Thailand, for example, nearly 90 percent of ICT graduates did not have the skills in coding that ICT companies sought (Tan and Tang 2016). This was attributed to irrelevant and outdated curricula, which is also a challenge in India, where the digital skills curriculum in schools and colleges has not kept up with industry demands (ILO 2019b).

TVET programs also lack attention to green skills. Despite the power and potential of greening education, in most countries skills for the green transition are not yet part of the TVET curriculum (ILO 2019a). In a study of curricula in 100 countries, less than half of the countries had mentions of climate change or environmental themes (UNESCO 2021a).

18 "Basic skills" include copying or moving a file or folder, using copy and paste tools to duplicate or move information within a document, sending e-mails with attached files, and transferring files between a computer and other devices; "standard skills" include using basic arithmetic formula in a spreadsheet; connecting and installing new devices; creating electronic presentations with presentation software; and finding, downloading, installing, and configuring software.

SECTION 5.2.
Limited Work-Based Learning, Unsupported Teachers, and Outdated Tools

Too little Work-Based Learning

There is broad consensus that the quality and relevance of TVET in L/MICs could greatly improve if learning, in and beyond TVET institutions, were more experiential. For example, when asked about which areas of their TVET programs need substantial improvement, TVET graduates in Nepal cited opportunities to acquire practical skills, workshop and lab equipment, and industrial attachment (Acin 2016). In Belarus, an assessment of specialized secondary institutions and vocational schools found that about a quarter of sampled institutions have programs that have no practical component; for programs that had a practical component, it usually comprises less than half of the curriculum.[19]

In most formal TVET systems, WBL incidence, duration, and quality are limited (Box 5.1.). Some sort of formal apprenticeship is reportedly offered in 145 countries (Chankseliani et al. 2017). Data from Latin America show, however, that in 2016 there was less than one apprentice per 1,000 employed persons in the member institutions of the ILO Inter-American Centre for Knowledge Development in Vocational Training (ILO–Cinterfor). An exception was Colombia; its 17 apprentices per 1,000 employed persons is similar to the incidence in France but still far lower than Switzerland's 44 and Australia's 40 (ILO 2017 and 2012).[20] Apprenticeships are also rare in most Asian countries. In Cambodia, learners at 12 of the 14 training institutions overseen by the Ministry of Education, Youth and Sports are expected to participate in some form of WBL Yet, at these institutions, less than two out of three learners (63 percent) reportedly participate in WBL. Over a third of representatives of the TVET institutions report perceiving apprenticeships and internships as overburdening and distracting learners (World Bank Forthcoming (a)). In the Philippines, 3.2 percent of the 2.3 million VET participants were enrolled in Enterprise-Based Training programs in 2016 (Swisscontact 2019). A notable exception is Sri Lanka, with apprentices accounting for 17 percent of all new TVET students in 2019 (Sri Lanka Tertiary & Vocational Education Commission 2019). Similarly limited use of apprenticeships can be seen in Sub-Saharan Africa: in Kenya, the apprenticeship system absorbs only 500–600 students out of about 90,000 students enrolled, and in Malawi, apprenticeship applicants exceed the number of placements by a factor of eight (Arias et al. 2019). Reliable data on the incidence of formal WBL arrangements beyond apprenticeships are scarce to non-existent; and where they occur, they are likely to face challenges like those of apprenticeships. For example, while virtually all training providers sampled in Belarus and Romania reported the expectation that their students would participate in some form of WBL, in practice less than 10 percent of their students take part in apprenticeships or internships.[21]

19 Belarus TAP data, authors' estimates.

20 It is important to note that this low incidence can be due to the lack of apprenticeships within TVET as well as to the relatively small size of formal TVET programs.

21 Belarus and Romania TAP data; authors' estimates.

BOX 5.1.
Challenges of Work-Based Learning (WBL) in L/MICs

Countries' socio-economic contexts and weaknesses of TVET systems determine the challenges for effectively implementing WBL and their scale. The economies of most L/MICs face structural economic constraints given the dominance of informal and small firms. In these contexts, the demand for specialized technical expertise is limited, which contributes to the dearth of work placements (Allais 2020; ILO 2015). In Malawi, the shortage of companies ready to host learners is the main challenge of the industrial attachment program (Matsimbe 2020). The COVID-19 pandemic exacerbated this challenge by severely disrupting WBL, due to closures and limited operations of workplaces. In a global survey of enterprises conducted between April and June 2020, 90 percent of apprentices and 83 percent of interns reported to have experienced complete or partial interruptions of WBL (ILO 2021). With some exceptions, distance learning options were not able to replace on-site WBL (ILO et al. 2021).

In addition, weaknesses in TVET systems' foundations and stakeholder interactions limit the incidence and effectiveness of WBL. Governments in L/MICs can struggle to put in place governance structures and regulations that are clear and adequate, and that can be implemented and monitored with available resources. It is quite common that regulations for employers and TVET providers regarding the pedagogical capacity of in-company mentors, curriculum requirements, or assessment procedures are unclear or insufficiently monitored (Republic of South Africa 1998). Many L/MICs lack effective consultative bodies for labor market representatives to express their views and to influence the direction and content of TVET programs, including WBL. Coordination failures may also occur between a training institution and employers. Misunderstandings may arise about how WBL should be conducted, which may affect quality assurance. This can contribute to reducing the learning outcomes achieved through WBL and increase the risk of exploitation for apprentices or interns.

Despite intention and effort L/MICs often face significant challenges in providing WBL opportunities. In Mongolia, although two-thirds of representatives of Vocational Training and Production Centers (VTPCs) included improving access to internships or apprenticeships among the top three priorities to improve the quality of training (World Bank Forthcoming (d)), teachers indicated that it is "difficult to facilitate the practical aspects of competencies due to a lack of facilities." In Vietnam, 32 percent of representatives of the TVET institutions surveyed and 66 percent of surveyed employers thought that more access to internships and apprenticeships was needed (World Bank Forthcoming (b)). In Kenya, though training institutions reported putting effort into finding internships, apprenticeships, or job placement for students, only half reported being able to place students in apprenticeships. This may be partly due to the general scarcity of such opportunities, but it may also be due to underdeveloped career development services (World Bank 2017a).

Under-prepared and under-supported TVET leaders and teachers

Managers of TVET institutions may not be sufficiently prepared to carry out their roles. Leaders of TVET institutions need a sound understanding of TVET and labor markets and the capacity to improve the performance of their institutions by, e.g., developing and managing teachers, engaging employers and other stakeholders, and ensuring appropriate training delivery for a diverse student population (Graham and Dean 2018). Evidence from some HICs shows a positive correlation between institutional leadership and learners' achievement and teaching competence; similar

links are likely to exist in L/MICs (Kim and Phang 2018; Ruiz-Valenzuela et al. 2017, as cited in OECD 2021c). However, leaders in TVET institutions tend to have weaknesses and lack the necessary support. For example, a recent survey of the public and private training institutions overseen by the Ministry of Education, Youth and Sports in Cambodia found that half of the leadership teams surveyed agreed that training institutions should not be concerned with skills employers need but rather with skills students need. Less than half of the leadership teams in the same survey were fully convinced that defining performance targets can improve the performance of training institutions (World Bank Forthcoming (a).

Challenges can become even more pressing when institutions become more autonomous. For example, when asked about how prepared they were for greater autonomy in terms of capacity and resources, 40 percent of TVET leaders in Vietnam and about 30 percent in Kazakhstan considered themselves not well-prepared. In Vietnam, 92 percent of respondents indicated that the ability of managers to take on new roles with greater autonomy is a key challenge. When leadership teams of TVET institutions in Kazakhstan, South Africa, and Vietnam were asked about areas in which they need support, the majority in each country mentioned accessing different sources of funding, with many also citing support to develop employer relationships (Graham and Dean 2018).

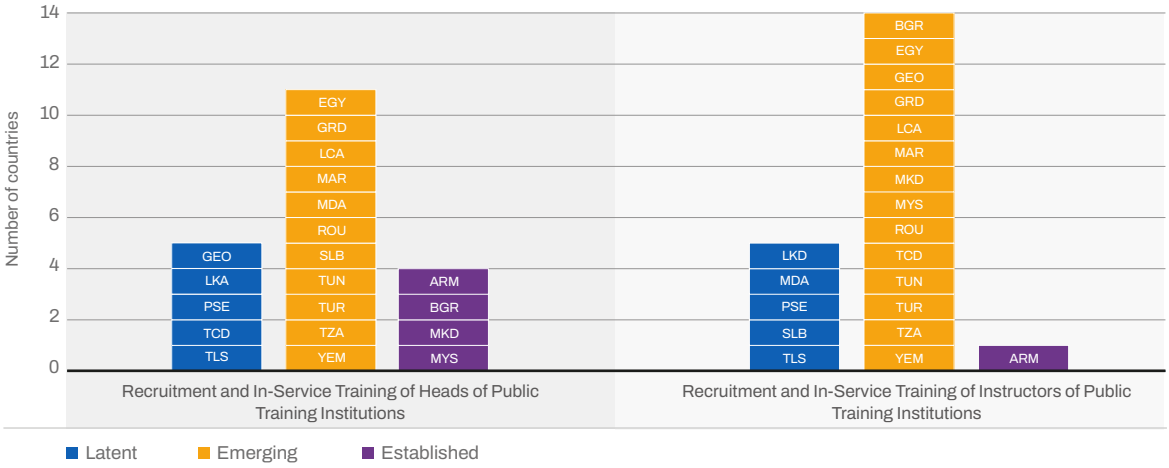
As in other parts of the education and training system, teachers are central to TVET quality.[22] In many ways, teacher recruitment, development, and management is more complex in TVET than in general education but is less well understood. The Workforce Development module of the World Bank's Systems Approach for Better Education Results (SABER-WfD) analyzes country policies on many important topics, including those related to teacher policies (Annex 5.1). As observed in (Figure 5.4), most countries benchmarked with the SABER-WfD tool struggle with recruitment and training of staff (teachers and managers) in public TVET institutions: No country was rated as implementing systemic good practices that meet global standards ("advanced"); most countries were rated "emerging"—demonstrating a few instances of good practice, and five countries were rated "latent," the earliest stage of development.

TVET teachers need to have very diverse and up-to-date technical skills and industry experience. A wide variety of technical skills is needed to cater to the diverse skills demands in different fields, and these skills need to be updated at the same pace as occupational requirements change. In terms of recruitment, the TVET sector may find it difficult to compete with industry, especially in areas where technical skills are in high demand (ILO and UNESCO 2018). The breadth of technical skills also complicates teacher deployment, since technical skills are often not broadly transferable across occupations, let alone fields of study. There are also high demands on the pedagogical skills of TVET teachers, not least because of the poor foundational skills of TVET learners. TVET's multiple delivery methods and locations pose additional demands on the capacity of both teachers and those who manage them. The changing role of TVET teachers, and the growing expectation they will support student WBL also calls

22 Across TVET systems, different terms are used for those providing instruction including, for example, teachers, trainers, and instructors. This report uses the term "teachers" for anyone providing instruction regardless of their location (in a training institution or a company) or level (secondary or post-secondary TVET).

for teachers and leaders who are well-prepared to build relationships and negotiate with local employers. The right balance in training between pedagogical and technical skills is also difficult to find because it will depend on whether a teacher's previous experience was mostly in industry or in education.

Figure 5.4: Many L/MICs Struggle with Teacher Recruitment and Development Policies in TVET



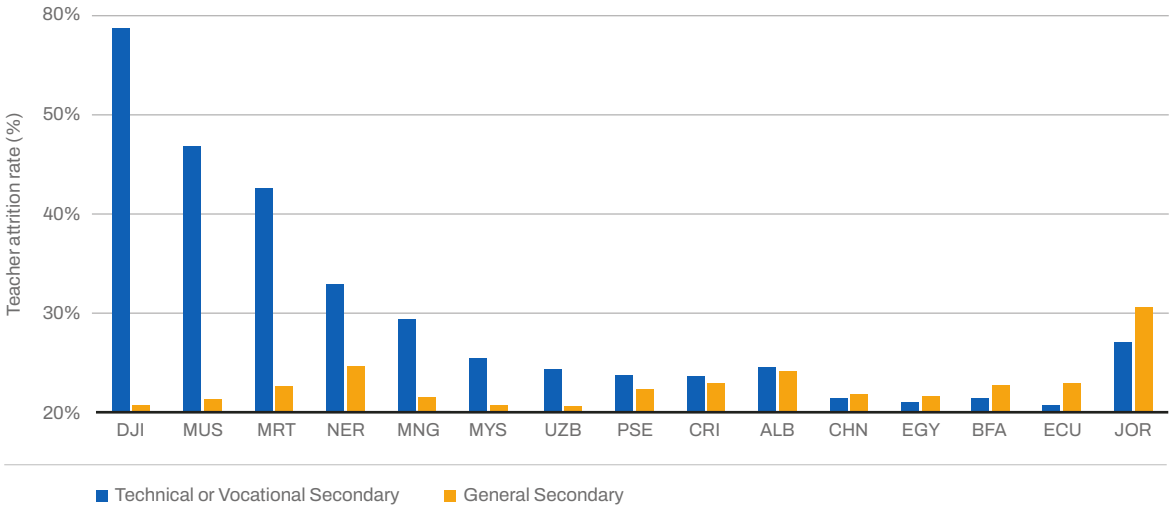
Source: World Bank SABER-WfD data.

Note: See Annex 5.1 for methodological details. See Appendix Table A.1 for country codes.

Getting TVET teacher recruitment, development, and management right is a challenge for many L/MICs, which means too few teachers have the right skills for the job. For example, a review of TVET teacher training systems in Latin America found "limitations in terms of quality, coherence, inclusion, pedagogy, innovation, role of teachers, and effectiveness" (UNESCO 2021b). In Asia, "inadequate numbers and qualifications" of TVET teachers are reported to be main reasons for low-quality instruction (ADB 2008). In secondary TVET, teacher attrition tends to be much higher than in the general programs. Of 15 L/MICs for which attrition rates are available, 10 had higher attrition rates for vocational secondary education than for general education (Figure 5.5). In a few countries like Niger, Mauritania, and Mauritius, more than 25 percent of the teaching force in secondary TVET leaves every year, and in Djibouti, that is true for 75 percent. Interestingly, there are no clear gender-specific patterns in secondary TVET teacher attrition rates: half of the countries with data report higher attrition rates for female teachers and the other half higher attrition rates for male teachers.[23]

23 UNESCO Institute of Statistics data; author calculations.

Figure 5.5: Teacher Attrition Rates in Secondary TVET Tend to Be Much Higher than in General Secondary



Source: UNESCO Institute of Statistics data.

Note: Covers L/MICs with latest available data for the period from 2011 to 2022, excludes HICs. Countries sorted by difference in teacher attirition rates between TVET and general secondary. See Appendix Table A.1 for country codes.

Partly due to high teacher attrition, the student-teacher ratio in many TVET programs may be excessively high, especially affecting the teaching of practical skills. Evidence on the effect of class size on student performance is mixed, although there is some evidence that smaller classes may benefit specific groups of students, such as those from disadvantaged backgrounds (OECD 2020b). In L/MICs, although systematic numbers are not available, student-teacher ratios in TVET do appear high in general, although with significant variation within countries. In Vietnam, for example, the ratio is about 30 students per teacher (the government standard is 20). This is likely to heighten pressure on teachers, increase their workloads, and arguably reduce the time available to improve their own skills—even if such opportunities were available (ADB 2014). As in other aspects of TVET, there is probably significant variation in teacher workloads, subjects, and institutions, as was recently documented in Kenya, where student-teacher ratios in well-established public TVET institutions varied from 5 to 35, with an average of 13 (Okinyi et al. 2021); in OECD countries, the average upper secondary student-teacher ratio is 13 for both general and vocational programs (OECD 2020b).

In addition to getting the right number of teachers, ensuring that they have the required mix of up-to-date technical, practical, and pedagogical skills is difficult in general, although the type and extent of the challenges likely differ between countries. In Asia, for example, lacking industrial experience has been emphasized as a particular constraint (ADB 2008). In Russia, about three quarters of teaching and administrative staff were reported to have an industry background but no teaching qualifications (Muraveva and Oleynikova 2019). The level and type of teacher skills can also differ considerably within the same TVET system. Company trainers, while technically experienced, often lack pedagogical skills. In Mexico, companies reported relying on workers without pedagogical knowledge to act as trainers (Wiemann 2019). In Ethiopia, as in other L/MICs, TVET teachers are recruited directly from university, where they acquire a theoretical background

but no vocational pedagogy or industry experience (Government of Ethiopia 2018). Consequently, teachers recruited often lack both industry and teaching experience (Euler 2015). Anecdotal evidence from LICs in Sub-Saharan Africa suggests that teachers in secondary TVET are sometimes graduates of the institution at which they teach, who started teaching without industry experience or teaching qualifications—which implies that they may lack requisite skills across the board. Beyond initial skills, there are also significant challenges in updating TVET teacher skills through continuous professional development (ILO 2016a). As experiences during the COVID-19 pandemic have shown, many teachers in L/MICs also require upskilling in digital skills for blended or online learning, and simply to be effective teachers is a rapidly digitalizing world (ILO et al. 2021).

Shifting toward competency-based training makes the challenges even greater. A survey of 150 teachers in three technical education institutions in Tanzania, conducted 10 years after competency-based education and training (CBET) was introduced, found that three out of four teachers were unable to prepare a competency-based lesson plan or deliver lessons using CBET approaches (Tambwe 2017). A study of 100 TVET professionals from over 50 institutions in Bangladesh found the lack of teacher training in CBET to be one of the barriers to effective use of the approach (Rahman et al. 2012). Similarly, a study of teaching practices in technical vocational colleges in Malaysia found that it was difficult for teachers to move from assessing student knowledge to assessing occupational and task-specific competencies (Rahman et al. 2014).

There is often no structured professional support to ensure that TVET teachers remain current on curricula and industry changes. Initial and continuing TVET teacher training can lack appropriate organization and structure and be limited by weak links with the private sector. This can result in, e.g., too few opportunities for initial and continuing professional development; missing or inadequate teacher standards and certification processes; and deficiencies in monitoring and quality assurance (Muwaniki and Wedekind 2019; Wiemann 2019). In numerous Latin American countries, there are no teacher training programs specifically geared to TVET; Bolivia and Ecuador have no pedagogical certification requirement for TVET teachers (UNESCO 2021b). Where there are regulations for monitoring, evaluation, and quality assurance, they are not necessarily implemented and may not take into account labor market relevance and outcomes (UNESCO 2021b). The need for industry experience may also not be recognized in certification policies (ADB 2008).

The experience in the Middle East and North Africa is illustrative of the range of issues that can exist in TVET teacher training. A review of teacher development practices in the region identified a variety of challenges in pre-service and in-service teacher training (UNESCO 2013a). Among others, in Algeria, Jordan, Lebanon, Morocco, and Tunisia, there were concerns that those training TVET teachers lacked experience in their vocational sectors. For pre-service training, curricula regularly lacked a sound basis because occupational standards were absent (Tunisia), not yet implemented (Morocco), or applied only to a segment of TVET teachers (Egypt). Access to in-service training seemed to be limited to certain groups, such as those on part-time or fixed-term contracts (Tunisia) or teaching practical skills in technical secondary schools (Egypt). The extent to which pre-service training responded to actual needs may

have been impeded by lack of needs analyses (Algeria, Tunisia) or weak incentives; for instance, in Tunisia, a single agency both received funding and was the main provider of in-service training. Furthermore, teachers themselves may have had few incentives for professional development when their performance was not regularly assessed or when, as in Algeria, performance evaluations did not influence wages or promotions.

Beyond teacher skills, there are also issues with representation: especially in LICs, TVET teachers are predominantly male. In 53 of 86 countries for which 2007–11 data on TVET teachers in formal public and private institutions were reviewed, more than half of TVET teachers were men. In some countries, including Chad, Guinea, Mali, Niger, and Togo in Western Africa, the share of female teachers was less than 10 percent. The 33 countries where more than half of the teachers were women were mostly MICs in ECA and LAC, including the Dominican Republic, Georgia, and Suriname (Axmann et al. 2015). Overall, though, the number of female teachers is growing faster than that of male teachers, which will improve average gender parity (ILO 2010).

TVET teaching is often an unattractive career prospect compared to alternatives in industry and teaching in general education, so the best teachers tend not to enter TVET teaching or if they begin there, they do not stay long. For example, if wages in the industry are significantly higher than TVET wages, the most qualified workers may not become TVET teachers. The importance of this wage gap is exacerbated when TVET teachers have little flexibility to combine teaching and working in the industry or there are obstacles to moving between the two over a career. Teaching in TVET can also be less attractive than in general education because remuneration tends to be lower, contracts less secure, and there is an "almost universal imbalance in esteem between the TVET sector and general education" (ILO and UNESCO 2018). As discussed next, TVET institutions in L/MICs are often underfunded and lack state-of-the-art equipment and facilities, making them less attractive workplaces than schools and universities. Lower social status and salaries and less job security all affect the reputation and quality of TVET teaching, creating a vicious cycle (Euler 2015).

Outdated infrastructure, equipment, and learning materials

Beyond teachers, TVET quality and relevance are also deterred by gaps in complementary physical and digital infrastructure, equipment, and learning materials. Assessments of TVET systems globally routinely document gaps in infrastructure and, especially important for TVET, equipment and materials. In Nigeria, for example, it was observed that "Technical and Vocational Schools are a shadow of themselves where the science equipment and laboratory apparatus are heard of, rather than seen. Where the equipment is available, it has become obsolete" (Akanbi 2017). Similar situations have been documented in Cameroon, South Africa, and Thailand, in terms of inadequate infrastructure and outdated equipment (OECD 2021a; Wildschut and Kruss 2018; Akanbi 2017). Challenges with acquiring new equipment can have longer-term effects on quality and relevance: in Ghana, curriculum revisions consider the equipment available instead of aligning with the equipment commonly used in the labor market (ILO 2020a).

The lack of digital infrastructure, equipment, and capacity to deliver blended and online learning is rapidly becoming a constraint on TVET quality and relevance. Together with the lack of teacher capacity, the lack of appropriate digital infrastructure, equipment, and resources helps explain why formal TVET systems in L/MICs have been slow to exploit the potential benefits of digital technology.

These limitations were evident during COVID-19. When remote learning became the only option to continue education during the pandemic, some countries and population groups were more prepared than others. This depended on how fully ICT was integrated into the social fabric of everyday life, pre-pandemic investments in digital technology, and access—for both teachers and learners—to reliable electricity connections and high-speed internet connections; hardware; relevant software applications and content; and technical and training support (ILO et al. 2021).

Access to technology is still limited, especially in LICs and for groups at risk of exclusion. For example, in 2020, only 21 percent of the population in LICs was estimated to be using the internet, compared to—the still low—57 percent in MICs.[24] Poor and disadvantaged students are more likely to lack access to what is necessary for remote learning, thus exacerbating existing inequalities. Indeed, globally men are 12 percent more likely to use the internet than women; In Africa, the gap rises to 25 percent (UNESCO 2018). This poses particular challenges for TVET, compared to general education, since TVET learners are more likely to have disadvantaged backgrounds.

Even efforts to use low-tech approaches to facilitate remote learning during the pandemic were not always effective. For example, in Sri Lanka, more than a third of major TVET courses continued during the pandemic using low-tech solutions like social media. However, they struggled to deliver online lectures, partly because not all students could access digital learning tools. This experience contrasted with Sri Lankan higher education institutions, in which the use of online collaboration tools such as Zoom significantly accelerated during the pandemic (Hayashi et al. 2021). The effectiveness of remote TVET delivery was further hampered because of the inability to recreate the experiential learning that would otherwise have taken place in workplaces, laboratories, and workshops. In addition, despite mushrooming online education materials, there are still few online resources targeting work-specific technical skills, especially those contextualized for L/MICs (World Bank 2021b).

24 This is the share of the population that has used the internet from any location in the previous 3 months. International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database.

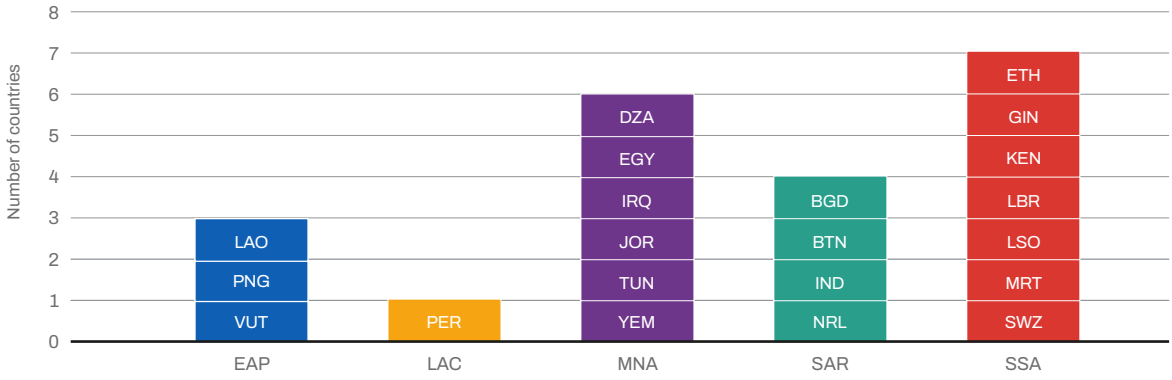
SECTION 5.3.
Lack of Focus on Student Needs and Minimal Engagement with Enterprises

Because TVET systems in L/MICs often lose sight of their main clients—learners and enterprises—training tends to be neither student-centered nor demand-driven. The inadequate focus on students' needs is illustrated by shortages of opportunities to access further education and training and of student support services. The struggles with engaging enterprises in shaping, funding, or even providing TVET are mostly tackled in the section on stakeholder engagement.

Lack of articulated pathways to further education and inadequate student support

The lack of pathways between TVET and general education and of opportunities to recognize and certify skills can make TVET less attractive. In many L/MICs, TVET could be viewed as a dead-end track because there are no opportunities to continue general education and training after graduation (UNESCO 2018d). Indeed, as shown in Figure 5.6, 21 L/MICs, including seven countries in Sub-Saharan Africa and six in Middle East and North Africa, do not provide a pathway to directly access general tertiary education for even one of the TVET programs offered at the upper-secondary or post-secondary levels. This is a very low bar. Moreover, learners do not always receive nationally recognized certification upon completion of TVET programs. For example, in Vietnam, less than half of the TVET institutions surveyed confirmed awarding nationally recognized certificates for most of their programs (World Bank Forthcoming (b)).

Figure 5.6: In About 20 L/MICs TVET Programs Have No Direct Pathway to General Tertiary Education



Source: UNESCO Institute of Statistics information, http://uis.unesco.org/en/isced-mappings.

Note: Countries are classified as having vocational programs allowing access to tertiary education if they have at least one that does so (i.e., the existence of programs coded as 354 or 454 in ISCED classifications). EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa. See Appendix Table A.1 for country codes.

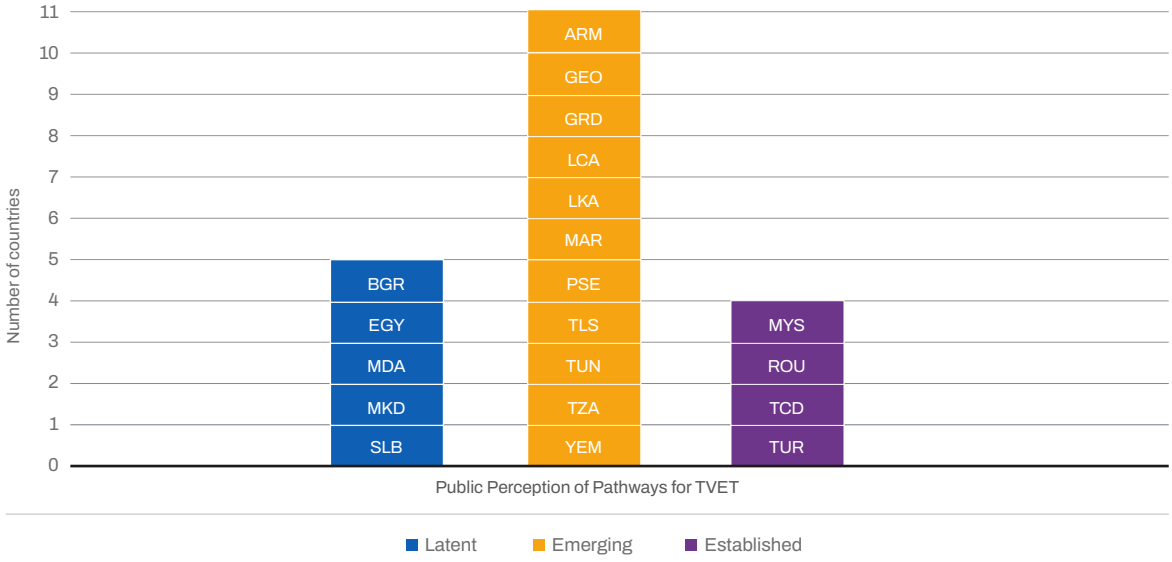
Inadequate student support can lead to poor program choices and inability to pursue further education. In South Africa, support services in TVET colleges were not well aligned with needs at higher levels of education, contributing to poor student performance and few students transitioning to university (Needham 2019). Challenges faced in implementing student support services included, among others, minimal allocations of staff for student support; low awareness of the need for support; and insufficient financial and infrastructural resources to facilitate student support (Needham 2019). Another study in South Africa highlighted the consequences of a lack of student support: more than a third of students interviewed reported studying what was available rather than wait for spaces to open up in their first-choice program (Papier and McBride 2019). While career counseling was offered in most institutions in Kenya, its quality varied; and nearly all counseling focused on orientation sessions at the beginning of a program (96 percent of institutions) or coaching sessions led by instructors (83 percent) rather than a continuing engagement between enterprises and students (World Bank 2017a). In surveys of East Asian and Pacific countries, most training providers indicated that career counselling was provided to learners through orientation sessions at enrollment and training on CV writing, and somewhat less often through career fairs or career centers. However, there appeared to be scope for making these services more effective. For example, in Tonga, although two out of three institutions surveyed reported providing career counselling, focus group discussions with learners revealed that many learners still struggled with determining what to do after graduating (World Bank Forthcoming (c)). In Vietnam, the effectiveness of career guidance was undermined because teachers and other staff who provide guidance had no training, there were no labor needs forecasts, and there was insufficient use of alumni networks (World Bank Forthcoming (b)).

Supply rather than demand-driven TVET

Given the high expectations and its mixed record, it is not surprising that the quality and relevance of TVET in L/MICs often fails to meet employer and learner needs. As Figure 5.7 shows, public perceptions about TVET in L/MICs can be improved. Negative perceptions tend to revolve primarily around graduates' lack of up-to-date technical knowledge and practical skills; innovative businesses in particular are dissatisfied with TVET (Sanchez Puerta et al. 2016). In Thailand, while enterprises report that they face shortages of workers with TVET qualifications, they also report that the skills of TVET graduates do not meet their needs (OECD 2021a). A survey of employers that hired graduates of short-term training in Bangladesh also revealed this gap between skills and expectations; the majority of employers surveyed rated graduates' skills as less than sufficient; the ratings for job-specific skills were particularly low: just slightly over a third of enterprises rated them fully sufficient (World Bank 2015a). In Malaysia, in-depth interviews with six industry panels showed that more than 70 percent of graduates have only lower-level skills qualifications. In these interviews, some employers also complained about TVET graduates' lacking socioemotional skills, such as communication, leadership, and teamwork (Bassah 2022). Similar findings of a lack of appropriate skills across the

board—not just technical skills— were obtained in a tracer study of TVET graduates in Sudan's Khartoum state (Sorkati et al. 2016). In focus groups of 80 private firms in three cities in Kenya, employers stated that although for technical jobs they preferred graduates of TVET institutions rather than university graduates, they were troubled by a general lack of communication, customer care, and sales skills among TVET graduates (World Bank 2017a).

Figure 5.7: Most Countries Have Significant Room to Improve TVET Pathways into General Education



Source: World Bank SABER-WfD data.

Note: See Annex 5.1 for methodological details. See Appendix Table A.1 for country codes.

ANNEX 5.1.
Diagnostic Tools to Assess Workforce Development Policy Intent and Practice

Two diagnostic tools to systematically assess workforce development systems are the World Bank's System Assessment for Better Education Results (SABER) on Workforce Development (WfD), and the Training Assessment Project (TAP). The former assesses policy intent, the latter policy implementation. Although WfD can be interpreted more broadly, the scope of analysis in most countries is formal and non-formal initial and continuing TVET.

SABER – Workforce Development

The SABER-WfD tool benchmarks national WfD systems against international standards. It systematically investigates a country's WfD institutions, policies, and praxis, and what they reveal about system capacity to conceptualize, design, coordinate, and implement WfD policies. Data are collected through an extensive questionnaire used for key informant interviews. The data collection instrument uses a cascading structure to organize the questions in the tool. It first groups the questions into three broad functional dimensions (strategic framework, system oversight, and service delivery). Each dimension is separated into policy goals that correspond to important thematic aspects of WfD institutions, policies, and praxis. The questions related to each policy goal are then grouped by topic in order to create an efficient and natural flow in the line of inquiry during data collection (A5.1.1). The data collected are then used to score each topic on a four-point scale (Latent – Emerging – Established – Advanced), which is then aggregated into scores for each policy goal and functional dimension. The tool is thus benchmarking the WfD system against international standards and, when the tool is applied more than once in the same country, it is possible to track the evolution of the WfD system over time. Since 2012 the SABER-WfD tool has been applied in over 30 countries (Table A5.1.2).

Training Assessment Project (TAP)

Whereas SABER-WfD mostly investigates policy intent, the TAP diagnostic tool provides a bottom-up perspective by focusing on the performance of training providers. TAP translates the nine policy goals of SABER-WfD into nine institutional goals that training institutions should achieve to maximize their performance and promote the gainful and productive employment of their learners:

(1) Setting strategic direction

(2) Gathering, analyzing, and publicizing data for informed decision-making

(3) Developing a demand-driven approach to training

(4) Establishing a sustained relationship with authorities

(5) Ensuring institutional financial viability and efficiency

(6) Fulfilling quality standards

(7) Creating a teaching experience conducive to learning

(8) Preparing students for the world of work

(9) Enabling students to pursue education and training opportunities.

For each of these goals, specific institutional actions are then identified that should lead providers to achieve the goal.

The TAP process in a country starts with a mapping tool to identify all training providers and collect basic data on their status, programs, and enrollment. Information on provider goals, inputs, actions, and outcomes is then collected through a survey of providers, complemented by focus group discussions with learners, graduates, and employers. The survey supports a detailed assessment of provider practices within each action area as well as across them, and is accompanied by a sophisticated online scoring system that generates actionable feedback for institutions and government stakeholders. The scoring is rated on the same four-point scale (Latent – Emerging – Established – Advanced) as is used in the SABER-WfD tool.

The scope of providers in a country analyzed by TAP can be adapted based on needs and preferences. In Moldova, for example, the analysis focused exclusively on providers of short-term training; in Vietnam, the diagnostic targeted universities, vocational colleges, and vocational secondary schools. Similarly, questionnaires and focus group discussion topics can be adapted to align with national needs and preferences. Since 2016, the TAP tool has been applied in 13 L/MICs and territories (Table A5.1.3).

Table A5.1.1: Functional Dimensions, Policy Goals, Actions, and Topics in SABER-WfD

		Policy Goal	Policy Action	Topic	
Dimension 1	Strategic Framework	G1 Setting a Strategic Direction	Provide sustained advocacy for WfD at the top leadership level	T1	Advocacy for WfD to Support Economic Development
				T2	Strategic Focus and Decisions by the WfD Champions
		G2 Fostering a Demand-Driven Approach	Establish clarity on the demand for skills and areas of critical constraint	T1	Overall Assessment of Economic Prospects and Skills Implications
				T2	Critical Skills Constraints in Priority Economic Sectors
			Engage employers in setting WfD priorities and in enhancing skills-upgrading for workers	T3	Role of Employers and Industry
				T4	Skills-Upgrading Incentives for Employers
				T5	Monitoring of the Incentive Programs
		G3 Strengthening Critical Coordination	Formalize key WfD roles for coordinated action on strategic priorities	T1	Roles of Government Ministries and Agencies
				T2	Roles of Non-Government WfD Stakeholders
				T3	Coordination for the Implementation of Strategic WfD Measures
Dimension 2	System Oversight	G4 Ensuring Efficiency and Equity in Funding	Provide stable funding for effective programs in initial, continuing and targeted vocational education and training	T1	Overview of Funding for WfD
				T2	Recurrent Funding for Initial Vocational Education and Training (IVET)
				T3	Recurrent Funding for Continuing Vocational Education and Training Programs (CVET)
				T4	Recurrent Funding for Training-related Active Labor Market Programs (ALMPs)
			Monitor and enhance equity in funding for training	T5	Equity in Funding for Training Programs
			Facilitate sustained partnerships between training institutions and employers	T6	Partnerships between Training Providers and Employers
		G5 Assuring Relevant and Reliable Standards	Broaden the scope of competency standards as a basis for developing qualifications frameworks	T1	Competency Standards and National Qualifications Frameworks
				T2	Competency Standards for Major Occupations
			Establish protocols for assuring the credibility of skills testing and certification	T3	Occupational Skills Testing (CVET)
				T4	Skills Testing and Certification
				T5	Skills Testing for Major Occupations
			Develop and enforce accreditation standards for maintaining the quality of training provision training institutions and employers	T6	Government Oversight of Accreditation
				T7	Establishment of Accreditation Standards
				T8	Accreditation Requirements and Enforcement of Accreditation Standards
				T9	Incentives and Support for Accreditation
		G6 Diversifying Pathways for Skills Acquisition	Promote educational progression and permeability through multiple pathways, including for TVET students	T1	Learning Pathways
				T2	Public Perception of Pathways for TVET
			Facilitate life-long learning through articulation of skills certification and recognition of prior learning	T3	Articulation of Skills Certification (CVET)
				T4	Recognition of Prior Learning
			Provide support services for skills acquisition by workers, job-seekers and the disadvantaged	T5	Support for Further Occupational and Career Development
				T6	Training-related Provision of Services for the Disadvantaged
Dimension 3	Service Delivery	G7 Enabling Diversity and Excellence in Training Provision	Encourage and regulate non-state provision of training	T1	Scope and Formality of Non-State Training Provision
				T2	Incentives for Non-State Providers
				T3	Quality Assurance of Non-State Training Provision
				T4	Review of Policies towards Non-State Training Provision
			Combine incentives and autonomy in the management of public training institutions	T5	Targets and Incentives for Public Training Institutions
				T6	Autonomy and Accountability of Public Training Institutions
				T7	Introduction and Closure of Public Training Programs
		G8 Fostering Relevance in Public Training Programs	Integrate industry and expert input into the design and delivery of public training programs	T1	Links between Training Institutions and Industry
				T2	Industry Role in the Design of Program Curricula
				T3	Industry Role in the Specification of Facility Standards
				T4	Links between Training and Research Institutions
			Recruit and support administrators and instructors for enhancing the marketrelevance of public training programs	T5	Recruitment and In-Service Training of Heads of Public Training Institutions
				T6	Recruitment and In-Service Training of Instructors of Public Training Institutions
		G9 Enhancing Evidence-based Accountability for Results	Expand the availability and use of policyrelevant data for focusing providers' attention on training outcomes, efficiency and innovation	T1	Administrative Data from Training Providers
				T2	Survey and Other Data
				T3	Use of Data to Monitor and Improve Program and System Performance

Source: World Bank 2013e.

Table A5.1.2: Countries and Year of Implementation of SABER-WfD

Region	Country	Year
SSA	Chad	2014
	Tanzania	2015
	Uganda	2012
EAP	Korea, Rep.	2013
	Malaysia	2013
	Singapore	2012
	Solomon Islands	2014
	Timor-Leste	2013
ECA	Armenia	2014
	Bulgaria	2014
	Georgia	2014
	Ireland	1980
	Ireland	1990
	Moldova	2013
	North Macedonia	2014
	Romania	2017
	Türkiye	2012
LAC	Chile	2000
	Chile	2011
	Grenada	2013
	St. Lucia	2013
MNA	Egypt, Arab Rep.	2014
	Iraq	2013
	Morocco	2012
	Tunisia	2012
	West Bank and Gaza	2014
	Yemen, Rep.	2013
SAR	Sri Lanka	2014

Table A5.1.3: Countries and Years of Implementation of TAP

Region	Country	Year
SSA	Kenya	2016
ECA	Albania	2017
	Moldova	2017—18
	Romania	2020
	Belarus	2021
	Ukraine	2021
EAP	Cambodia	2021
	Gansu (China)	2021
	Lao PDR	2021
	Republic of Korea	2021
	Mongolia	2021
	Tonga	2021
	Vietnam	2021

Source: World Bank Forthcoming (e); World Bank 2013e; World Bank 2021a; Valerio 2019; World Bank 2018b; World Bank Forthcoming (b); World Bank 2017c.

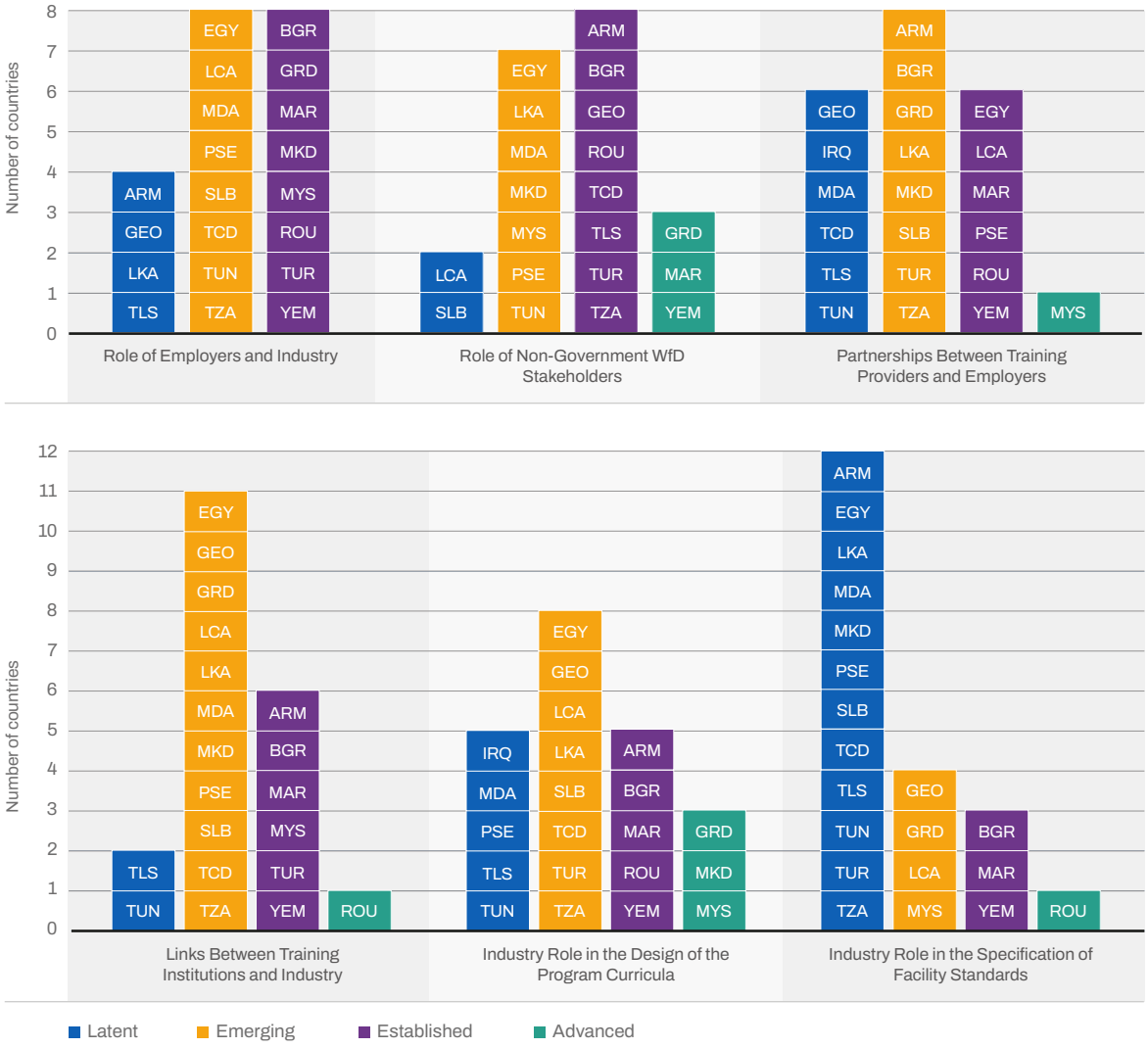
Note: EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa.

CHAPTER 6.

Irregular and Uncoordinated Stakeholder Engagement in TVET

In many L/MIC TVET systems, stakeholders—particularly private enterprises—are not engaged enough in TVET. The main challenges are to ensure adequate coordination between all stakeholders, so that together they work toward clear goals, and to establish mechanisms for frequent and deep engagement, especially with private enterprises (Figure 6.1). Of all the World Bank SABER-WfD indicators related to stakeholder engagement, the ratings on two—"engaging industry in facility standards" and "links between training institutions and industry"—considered most L/MICs as either "latent" or "emerging."

Figure 6.1: Stakeholder Engagement in TVET Is Often Weak



Source: World Bank SABER-WfD data.

Note: See Annex 5.1 for methodological details. See Appendix Table A.1 for country codes.

Poor coordination of TVET stakeholders is a persistent weakness in L/MICs. Complicated and overlapping structures and responsibilities, conflicting interests, weaknesses in technical capacity, and lack of relevant information for evidence-based interactions are common issues (UNESCO and ILO 2018). To improve coordination, many countries have established multipartite coordination bodies, and in many cases, these have been at least partially successful in convening stakeholders. The Council for Technical and Vocational Education and Training in Grenada, for example, is credited with gaining multistakeholder buy-in for TVET reforms and interventions (World Bank 2013b). Yet in most countries, the existence of (sometimes multiple) coordination bodies, and the legislation and agreements they produce, have not been able to prevent coordination difficulties. In Bangladesh, while there is a National Skills Development Authority under the Prime Minister's office, the responsibility for skills training is scattered across 23 ministries (UNESCO and ILO 2018). Similarly, the Tunisian Supreme Council of Human Resource Development, chaired by the prime minister and considered the main mechanism for coordinating the education and training system, before the pandemic had not met for at least six years (UNESCO and ILO 2018).

The engagement of enterprises in TVET is a common weak link. The extent and nature of enterprises' engagement in TVET differ by country. Despite many efforts to improve coordination by reforming TVET governance and institutional architecture, governments are often found to be reluctant to assign a strong role to employers and other social partners beyond the early stages of policy dialogue (ETF 2015). In some countries, like Armenia, Egypt, and Tanzania, SABER assessments have found enterprise engagement to be sporadic (Mwaduma et al. 2015; World Bank 2014a; World Bank 2014b). In some cases, as in Iraq, this was despite formal coordination committees that did convene but where industry representatives did not feel their views were considered (World Bank 2013c). In Armenia, Azerbaijan, Georgia, and Vietnam, less than 10 percent of employers surveyed reported having regular interactions with education and training providers about blue-collar workers (Sanchez Puerta et al. 2016).

Even in sectors where engagement with enterprises is strong, the focus is most often on large formal enterprises, leaving most firms in L/MICs without a voice in TVET. In Morocco, for example, there is a good track record of industry management of training centers in automotive and aerospace technology but, as in many other countries, they struggle to engage small and informal enterprises, which make up a large share of Morocco's economy (World Bank 2015c).

Obstacles to building strong partnerships between enterprises and training providers include lack of awareness of partnership opportunities, concerns about transaction costs, and skepticism about the value of such partnerships. About half of the firms consulted in Kenya reported not engaging in formal collaborations with training institutes; of those, about half had never considered partnering with a training institution, and a quarter were concerned about complications in the process of establishing such partnerships. Other reasons for non-engagement were skepticism about the quality of training institutions, given that curricula are not regularly updated to reflect changing market needs (World Bank 2017a). Analysis of the participation of enterprises in TVET curriculum development revealed low and mainly cosmetic levels of engagement, but the reasons

differed by respondent: curriculum experts indicated that enterprises did not understand the benefits of participating in the curriculum design process; curriculum division officials complained that employers sent representatives who were not prepared to contribute to the process; and employers reported that their inputs were often not used, that they were invited to participate just to fulfill a requirement, and that participation in multi-day workshops was too costly for them in terms of production (Bajracharya and Paudel 2021).

Interactions with employers and other social partners can be particularly challenging in L/MICs, not least due to the prevalence of micro and small, often informal, enterprises. The large share of small and informal enterprises in most L/MICs adds significant complications, in part because these firms are less likely to have staff and budgets dedicated to human resource development (Matlay and Poell 2019). In addition, smaller firms—often informal— are less likely to provide formal training. Firms with fewer than 20 employees are two to three times less likely to provide formal training to their workers than firms with more than 100 employees.[25] Engaging small, informal enterprises in broader efforts to coordinate skills development is further complicated by the fact that they are often less well-organized and have minimal networks with the public sector (Almeida and Aterido 2015).

Coordination can also be weak between stakeholders within the public sector, even when apex bodies are in place. This can occur, for example, due to complex governance structures for TVET that include multiple national and subnational administrations and agencies, overlapping mandates, and limited financial and human capacity. In Indonesia, the formal part of the TVET system (including administration of around 17,000 upper-secondary or higher education institutions and the regulation of more than 15,000 private providers) is managed by the Ministry of Education, Culture, Research, and Technology and Ministry of Religious affairs, and the non-formal part (including administration of almost 16,000 public institutions and supervision of about 10,000 private or community training centers) is managed jointly by the Ministry of Education, Culture, Research, and Technology and of Manpower. Moreover, financing of non-formal and formal training at the upper-secondary and higher education levels involves 17 more ministries (World Bank 2021a). Mechanisms for coordination are often inadequate. In Timor-Leste, for example, coordination between government ministries and agencies that have responsibilities for TVET relies solely on ad hoc mechanisms (World Bank 2013d). The existence of coordinating structures may not be enough to guarantee effective coordination.

The increasing role of nontraditional actors in TVET implies that traditional coordination structures are not always sufficient to achieve the desired level of stakeholder alignment and collaboration. Universities, for example, increasingly provide labor-market–oriented courses, blurring the conceptual distinction between TVET and higher education (Majumdar and Rein 2017). Other nontraditional actors include public and private employment service providers, which integrate training provision in intermediation services, and large enterprises or groups of firms managing or providing training to address their own skills needs or those of their suppliers. Since the COVID-19 pandemic began, there has been a surge in the availability of and demand

25 Authors' calculations based on World Bank Enterprise Surveys (most recent year for 153 economies).

for online learning programs, often offered by international providers. While many are non-formal, the programs they provide may offer alternatives to potential formal TVET learners and have the potential to disrupt the training landscape globally (ILO 2020b). For traditional TVET institutions, these new providers can be competitors or partners. They often apply innovative approaches to learning and certification (Box 6.1.). This implies that some engagement with them would be beneficial, but it is not always easy to achieve, especially when it concerns private sector or internationally operating actors who do not traditionally liaise with authorities or participate in the development and operation of formal TVET systems.

BOX 6.1.

Coursera and Open Classrooms: Nontraditional TVET Providers

Internationally operating, nontraditional education and training providers are becoming more prominent. Whether for-profit and non-profit, they often apply innovative approaches, including by exploiting the opportunities offered by technology, to achieve impact. Examples include Coursera and Open Classrooms. Common features of these initiatives are:

1. **A differentiated offer tailored to a variety of learners, businesses, and institutional stakeholders**. A variety of providers apply a multi-tiered delivery model, allowing learners to select those training and related support options that best suit their needs, the time they have available, and their finances. Online education provider Coursera, for example, offers access to thousands of courses and programs ranging from courses freely accessible to those accessible via monthly prescriptions and master's tracks. Open Classrooms, an online platform providing courses in IT, technology, digital skills and entrepreneurship, offers free access to its roughly 1,000 courses, while requiring a monthly fee for learners who follow a training path towards a full-fledged accredited program. In addition to catering to individual learners, Coursera and Open Classrooms carry out Business-to-Business and Business-to-Government activities, which provide a substantial additional income stream. These activities include the upskilling of employees and training individuals registered with public employment services. Coursera for Campus supports universities by providing faculty with additional content and students with online courses that are integrated in their overall curriculum.
2. **Strong employer engagement for better demand-responsiveness and job prospects.** Providers aim to strengthen the demand-responsiveness of their training offer, and thereby the job prospects of their trainees, in a variety of ways. Open Classrooms designs its program offering based on an assessment of the skills requirements of jobs for which there are labor shortages. Coursera offers several industry credentials that have been designed with industry partners.
3. **Support to learners**. Some providers emphasize support to learners beyond delivering the program curriculum, to improve learning and the school-to-work transition. Open Classrooms provides learners following a full-fledged path with mentors who can meet with them weekly to help them stay motivated and focused, and with career coaches to, among other support, help them prepare for job interviews.
4. **The use of education technology (EdTech).** The increasing options for remote training have greatly boosted the reach of nontraditional training providers, many of which offer most or all of their training through distance learning. EdTech is also used to monitor training activities and their impact. Open Classrooms' B2B services, for example, include a dashboard for employers so that they can monitor the courses that their employees take and the skills that they build. Open Classrooms applies a project-driven approach to its accredited programs. To finish a path, learners must complete a series of projects. The courses that are intended to provide learners with the skills to complete these projects are optional, implying that those who already have the requisite skills can move through the program faster than those who have more to learn.

Source: http://www.coursera.org/ and www.openclassrooms.com.

Support from development partners can strengthen performance and deliver results, especially in the short term, but runs into many of the same bottlenecks that affect TVET reforms in general and that limit longer-term impacts. In some L/MICs, development partners play an important role in financing and shaping TVET. Development partner support often contributes to immediate results that can be measured by, for example, increased enrollment and improvements in essential inputs, such as infrastructure, teacher capacity, and curricula. However, like other investments in TVET, this support does not always improve labor market outcomes (Ricou and Moore 2020). Moreover, even input- and output-related benefits regularly dissipate after the support ends, perhaps because infrastructure is not well-maintained; equipment is not used; curricula are not updated; or teachers are not regularly trained (ADB 2008).

This could partly be attributed to a reliance on an incidental project-based approach rather than a programmatic engagement for long enough to build adequate stakeholder capacity and manage complex change processes (ILO 2016b; ADB 2008). Indeed, most of the Official Development Assistance (ODA) for vocational training is disbursed in the form of project support: in 2020, this accounted for 97 percent of funds in Sub-Saharan Africa and over 80 percent in Latin America and the Caribbean and South Asia.[26] The short horizon of project-based support may encourage interventions that overemphasize short-term results rather than systemic improvements, which take longer to materialize. In Uganda, for example, activities like skills assessments and programs were reported to be mainly ad hoc and financed by development partners (World Bank 2012a). These problems are compounded by major fluctuations in support over time within countries (Palmer 2017). Arguably, development partners have also underinvested in generating the evidence necessary for more informed policies nationally and globally through more rigorous monitoring and evaluation.

26 Authors' calculations based on the approach used in Palmer 2018. 'Vocational training' is as defined by the DAC Creditor Reporting Service code 11330, which covers both formal and informal pre-tertiary TVET. There are great methodological difficulties to looking at ODA for TVET via the DAC Credit Reporting Service (see King and Palmer 2011 and Palmer 2015a). The financial data in this review refers to disbursements rather than commitments (UNESCO 2011).

CHAPTER 7.

Weaknesses in TVET Systems' Foundations

Weaknesses in TVET access, equity, quality, and relevance, as well as in stakeholder engagement, often result from persistent problems in the foundations of a TVET system. This section discusses TVET systems' vision, strategic framework, governance, and funding and expenditures.

SECTION 7.1.

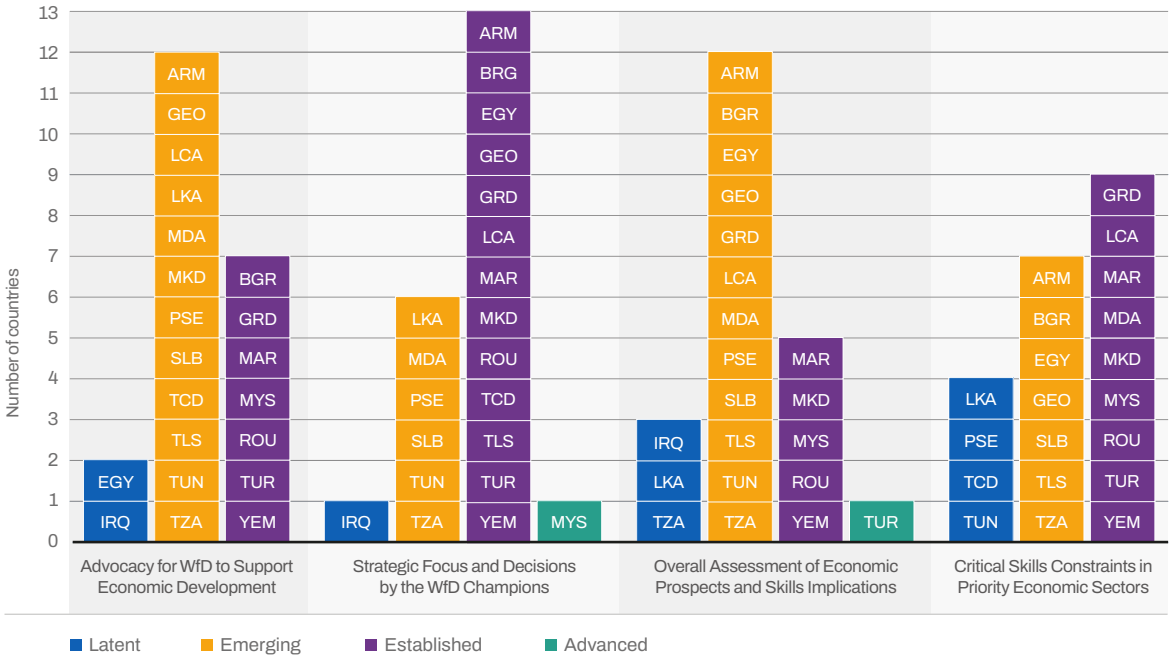
Underdeveloped Vision and Strategic Framework

Defining a clear vision for TVET requires weighing a variety of political, economic, and social objectives, which different stakeholders may articulate and prioritize differently. As discussed in chapter 2, achieving a common vision is particularly challenging for TVET compared to other segments of the education system because TVET operates at the intersection of education and work—with potential trade-offs depending on different types and levels of skills and between shorter- and longer-term employment, productivity, and sustainability goals. The clear segmentation in the types of students who enroll in TVET also makes identifying a vision for it fraught with numerous competing objectives.

While many countries do well in defining a vision for TVET and providing the necessary advocacy to make it effective, it is often difficult to identify the critical skills that TVET is meant to address and to improve public perceptions of TVET. Figure 7.1: L/MICs´ Efforts to Identify Skills Needs Should Increase presents the benchmarking ratings for 21 L/MICs on several indicators of the World Bank SABER-WfD assessment. Most countries assessed have demonstrated systemic good practice (that have earned an "established" rating) in terms of strategic focus, meaning that there has been action on the strategies set and that progress is monitored, although often through ad hoc reviews (World Bank 2013e). On the other indicators, less than half of the countries earned the "established" rating; moreover, several countries remained "latent," often because of problems with identifying "critical skills constraints in priority sectors and improving "public perceptions of pathways for TVET." While efforts have been made to conduct ad hoc labor market assessments of skills needs, the lack of clear institutional arrangements, coordinated data collection, and agreed

data flows, exacerbated by minimal institutional capacity limit the ability of L/MICs to gather, analyze, and use labor market intelligence to improve TVET (ILO et al. 2017).

Figure 7.1: L/MICs´ Efforts to Identify Skills Needs Should Increase



Source: World Bank SABER-WfD data.

Note: WfD = Workforce Development. Information for Iraq was not available for the 'Critical Skills Constraints" indicator. See Annex 5.1 for methodological details. See Appendix Table A.1 for country codes.

Even when countries do have a clear vision for TVET, many find it difficult to work with both government and non-government leaders to articulate and support the vision through sustained public advocacy (Tan et al. 2016). While countries may have the technical knowledge to formulate a vision, they may struggle with the leadership and coordination necessary to produce results. In Indonesia, for example, although government leaders are committed to creating a robust system for WfD, there is little agreement among them on the medium- and long-term vision for the system (World Bank 2021a). In Timor-Leste, WfD was a clear priority in the country's national strategy; but although there was forceful advocacy from government leaders there was hardly any from nongovernment stakeholders (World Bank 2013d). A similar situation existed in Egypt, and as a result promising reform interventions were not scaled up and reform momentum was lost (World Bank 2014b).

An insufficiently clear vision can make it more difficult to develop effective TVET strategies. In Armenia, for example, an assessment of the WfD system found that even though the vision of WfD was reflected in strategic documents, there was a disconnect between long- term strategic goals and the current vision for the system. In particular, while the long-term goals emphasized transformation and inclusiveness and focused on specific industries with the highest exporting potential, the vision gave priority to current skills needs across the board, often in nonpriority industries (World Bank 2014a). Such gaps between the TVET vision and strategies are not uncommon, as the SABER assessments show. In some countries, like Sri Lanka, the TVET system is supply-driven, with little private sector participation in training or feedback to the system on skills needs

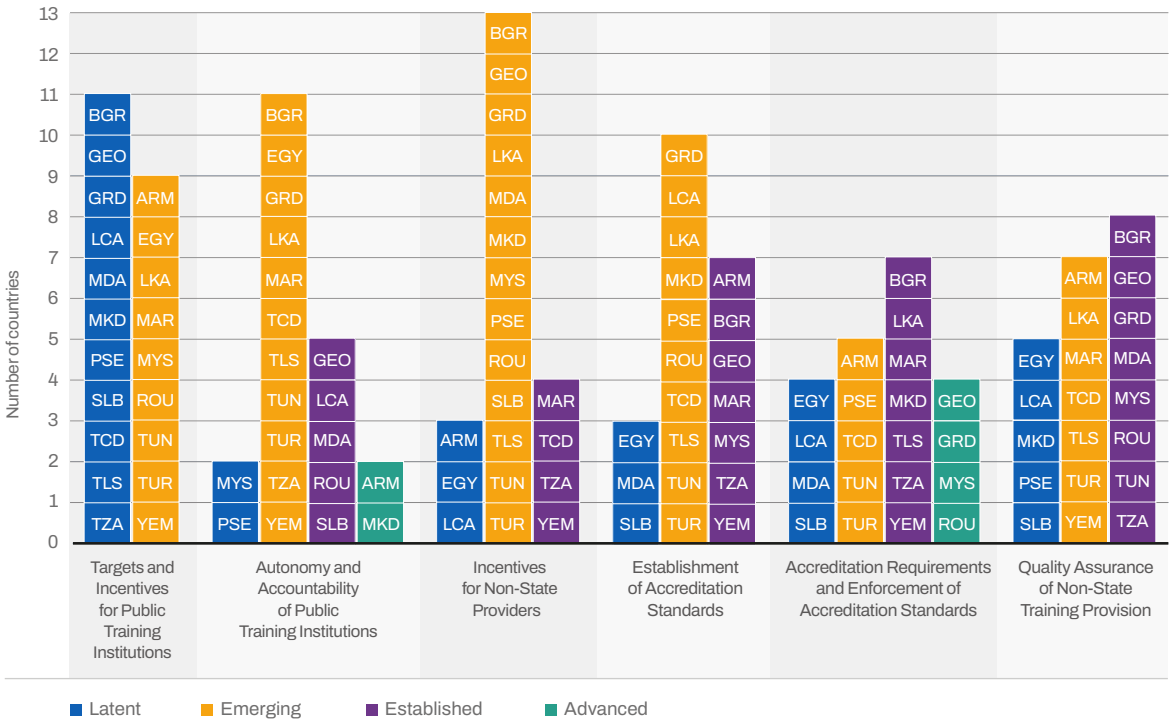
(World Bank Group 2014a), or a system, as in Indonesia, may emphasize enrollment targets and physical facilities for public providers rather than training quality and relevance or labor market outcomes (World Bank 2021a).

One of the most challenging elements of developing a clear TVET vision and strategic framework is the identification of critical skill needs through regular economic and labor market assessments. A situational analysis of skills assessment and forecasting in a few countries in the Middle East and North Africa region found that most lack relevant and detailed data to support a stable projection of likely future developments given political and economic uncertainty. These challenges are compounded by an extensive informal economy, which makes accurate measurement of the real scale and structure of employment difficult, complicating the modelling process (UNESCO 2021c).

SECTION 7.2.
Weak Governance

A number of governance challenges often impede TVET system performance. Among these are outdated laws and regulations, poor regulatory body coordination and limited capacity, imbalance between provider autonomy and accountability, inadequate quality assurance, and a lack of investment in labor market information systems. While some TVET systems in L/MICs have been able to establish and enforce accreditation standards (Figure 7.2), most struggle with incentivizing both public and private providers to deliver quality training.

Figure 7.2: Many Countries Struggle to Incentivize and Regulate Quality in TVET



Source: World Bank SABER-WfD data.

Note: See Annex 5.1 for methodological details. See Appendix Table A.1 for country codes.

It is difficult to improve TVET performance when enacting the necessary legal reforms takes a long time or is never completed. Generally, reforms depend on changes in legislation. The often-complex processes of changing laws in L/MICs can put the brakes on skills development systems. In Namibia, for example, launching a training fund took 10 years before it was adopted (UNESCO 2016).

Governance is complicated by fragmentation across ministries and administrative levels. In Tanzania, for example, the agency regulating vocational training is different from the agency regulating technical education; and the two regulators accredit providers that offer both types of programs separately; this not only adds to the administrative burden on both providers and ministries but also limits the power of a single regulator to enforce quality standards (Mwaduma et al. 2015). In Indonesia, the government established an agency to oversee and control competency testing and certification, but ministries continue to run parallel certification systems, causing harmonization challenges and inefficiencies, with accreditation requirements varying by type of providers and ministry oversight (World Bank 2021a).

Financial and human resource constraints of regulatory bodies in L/MICs affect the quality of TVET governance. A study on qualification frameworks in Africa found resource and capacity constraints to be a determinant of an institution's ability to keep qualification databases or registers current (Keevy et al. 2021). More generally, civil service capacity can be a constraint in TVET governance. Bhutan, for example, has well-designed coordination structures, but also has a shortage of skilled officials (UNESCO and ILO 2018).

Governments often emphasize strategic conceptualization and policy development over implementation and evaluation. As a result, even well-designed policies can fail to achieve the intended results when system oversight and service delivery fall short (World Bank 2013a). This occurs, for example, when the necessary regulatory framework does not exist, is not well-aligned with policy objectives, or regulations that exist on paper are not enforced. In North Macedonia, it is often difficult to apply system oversight policies because of financial and institutional constraints (World Bank 2014f). Despite its considerable strength in formulating strategic vision, policies, and institutions to support skills development, Malaysia has proved to be weak at oversight because policy formulation was not accompanied by similar attention to implementation and monitoring in a system that is characterized by fragmented institutional arrangements (World Bank 2013a).

Imbalances between provider autonomy and accountability and lack of performance monitoring

In providing training, countries may also struggle to achieve an appropriate mix of decentralization and accountability. Decentralizing decision-making aims to enhance the ability of TVET institutions to adjust their programs and services to local needs (Fawcett et al. 2014). However, achieving greater flexibility while ensuring that accountability arrangements are effective is not easy in practice; nor is it risk-free. In L/MICs, it is quite common for public TVET institutions to lack the decision-making power to adapt training to local needs. In Egypt, for example, institutions rarely have

the financial and managerial autonomy to retain income, revise curricula, introduce new programs, or recruit staff (World Bank 2014b). Similar problems were also found in Grenada and Iraq (World Bank 2013b; World Bank 2013c).

The lack of a results orientation in monitoring performance hampers efforts to hold TVET providers accountable for the quality and relevance of their training programs. Using performance indicators to enable more transparent oversight of TVET providers is important to make decentralized actors more accountable. However, TVET systems that have such indicators often measure enrollments or other factors related to budget and administration but do not measure such results as graduate employment outcomes. This is the case, for example, in Egypt, Indonesia, Malaysia, Sri Lanka, Tanzania, and Türkiye (World Bank 2021a; Mwaduma et al. 2015; World Bank 2014a; World Bank 2014b; World Bank 2014e; World Bank 2013a; World Bank 2012c).

Moreover, where there is a focus on institutional performance, the associated indicators are not always clearly articulated or are accompanied by incentives that reward institutions for meeting the agreed targets. In Indonesia, for example, some training providers are required to achieve targets, but they are not rewarded for good performance, nor do they face consequences if they underperform (World Bank 2021a). Similarly, in Türkiye, while administrative data are sometimes used to assess institutional performance, there are no explicit targets, and financial or non-financial incentives for performance are limited. This point will be discussed further in the following section on funding and expenditures (World Bank 2012c).

The collection and use of credible and relevant data to monitor and promote TVET performance is a general challenge for L/MICs. By and large, TVET systems do not have a culture of monitoring and evaluation or using resulting data to inform decisions. In most cases, TVET Management Information Systems (MIS) are lacking or weak. In Tanzania, for example, the collection, management, and use of provider- level data on inputs and outcomes is a weak point in the system, as data are not intensively used to identify opportunities for resource optimization or to measure the impact of programs on employment (Mwaduma et al. 2015). Evaluations of TVET graduates' labor market outcomes are relatively rare, among other reasons because their execution can be complicated, and time- and resource-intensive. In Egypt, the lack of monitoring and evaluation of training outcomes and of collecting data on labor market outcomes, and failure of ministries to conduct any program impact evaluations are seen as important constraints to strengthening accountability (World Bank 2014b). Indonesia, similarly, has only a few applications to assess labor market outcomes, and the performance of training institutions and of the system as a whole (World Bank 2021a).

While most countries collect administrative data on TVET institutions, the data are not automatically analyzed and used for decision-making or resource allocation. In Grenada, for example, while regular reporting on and audits of training providers were conducted, this information was not used systematically to improve their performance (World Bank 2013b). Similarly, in Kenya, while all institutions surveyed had formal targets and reported collecting data to measure achievement of such goals as student enrollment rates, pass rates in final assessments, and trainee satisfaction, most data were processed manually, limiting their use for planning (World

Bank 2017a). In Timor-Leste, all accredited state and nonstate training providers must collect and report basic administrative data, but these are only occasionally analyzed (World Bank 2013d).

The poor separation of TVET regulation and provision makes it more difficult to ensure accountability (Billetoft 2016). In Tanzania, the Vocational Education and Training Authority is responsible for coordinating, regulating, financing, and promoting vocational education, but it is also the primary provider of public TVET. If not carefully managed, arrangements like these can lead to conflicts of interest (Mwaduma et al. 2015). There is also potential for such conflicts in cases where industry sector skills bodies are involved in quality assurance or provide training while also being responsible for providing sector-specific advice to government on skills needs and priorities for their sector, as occurs in India (UNESCO and ILO 2018).

Many TVET systems have quality standards and quality assurance mechanisms but inadequate accreditation and inspection standards. Egypt and Türkiye exemplify the challenges that can emerge in quality assurance. They embraced a strategic focus on quality and relevance and adopted policies to improve qualifications, certification, and accreditation systems yet, like many other countries, they have found it difficult to carry out reforms. Egypt created an accreditation entity and piloted some interventions but it took more than 15 years to pass the laws necessary to establish a national qualification framework (ETF 2021a). Türkiye established institutions for setting occupational standards, defined a qualifications framework, and specified regulations for testing and certification, but the number of occupational standards established and the testing and certification mechanisms put in place have lagged (ETF 2021b; World Bank 2012c).

The direct ("short route") accountability of TVET providers to their beneficiaries for delivery of job-relevant and in-demand skills is also often inadequate. Learners, especially those from more disadvantaged households (of which there are many in TVET systems), may lack information about the performance of different providers; even when they have that information, they have little choice of training providers and have no way to exert influence to improve performance. The accountability of providers to employers may be similarly limited, especially in systems where TVET is largely publicly provided, and employers are not actively involved in oversight and implementation and do not have direct engagement with TVET providers (Ricou and Moore 2020). In some countries, short-route accountability is impeded by not just a scarcity of information on, for example, employment outcomes and program evaluations but also by a lack of public access to such data (World Bank 2014b; World Bank 2013a; World Bank 2012). The weaknesses in short-route accountability make it even more important to have strong quality assurance mechanisms (i.e., long-route accountability), to which we turn next.

Insufficient investment in labor market information systems

For TVET's governance to be effective, the system needs to be able to collect information on current and future labor market skills demands. An effective

labor market information system (LMIS) for TVET requires stakeholders to conduct credible assessments of skills needs to support forecasting, establish mechanisms for analyzing and disseminating data, and effectively translating skills demand information into actions that improve the quality and relevance of TVET systems. A strong LMIS can improve (a) the efficiency and impact of TVET systems by better aligning student aspirations and expectations with fields in demand; (b) the system's quality and relevance, by informing the skills TVET provides; and (c) equity, by bridging information gaps that particularly affect vulnerable or marginalized population groups.

However, L/MICs face persistent difficulties in collecting and analyzing information to elicit skills demands and in disseminating and using the information to improve TVET quality, relevance, access, and equity. In principle, skills needs assessment and forecasting exercises are structurally embedded in the decision-making processes of policymakers, TVET providers, industry, and learners. But many L/MICs encounter persistent difficulties in the process. Data are often not collected systematically, so that there are inadequacies in collection frequency, scope, and methodologies. Data collection exercises are often project-based and donor-funded, either as a self-standing exercise or to inform broader project activities or monitor outcomes.[27]

Even when the data are produced, their use is limited. For example, in an online UNESCO-UNEVOC survey of government officials, TVET managers, and trainers in 56 countries, more than half of the respondents reported that in their countries, national skills forecasts were regularly produced, but in those countries, only 18 percent of respondents reported frequent use of the data to update qualification systems and 12 percent reported its use in setting funding priorities. Moreover, only 11 percent of managers of TVET institutions reported receiving labor market information from their governments, and only 5 percent of providers reported receiving such information from their institutions (Subrahmanyam and Law 2020).

SECTION 7.3.
Input-Based Funding and Expenditures

TVET is more expensive than general education, for both good and bad reasons

TVET is often more expensive than equivalent general education. This is partly due to high equipment capital and operating expenses (especially when it often needs to be brought up to date) and costs associated with WBL, which includes the cost of company staff working as trainers as well as facility and equipment costs (Hoeckel 2008). High unit costs also arise from small class sizes, which are characteristic of some fields, some institutions, and some countries. According to OECD data, total per-student spending for vocational upper-secondary programs is higher than for general upper-secondary programs in most HICs and middle-income OECD member states, such as Mexico and

27 The World Bank STEP Skills Measurement Program and the ILO Rapid Assessments of Reskilling and Upskilling Needs are examples of tools that L/MICs have used to collect data on skills, although not on a regular basis.

Türkiye (OECD 2021b). The relative cost of vocational education has also observed to be higher in South Asia (Agrawal 2013) and East Asia (Newhouse and Suryadarma 2011). Analysis of 11 public expenditure reviews conducted by the World Bank after 2010 and containing information on per-student expenditures for vocational and general schools shows that, except for Ghana, vocational education was more expensive—sometimes as much as ten times more, as in the West Bank and Gaza. In Liberia, there was a significant difference between expenditures per student in general secondary schools (US$164.4) and in TVET (US$2,941). TVET expenditures (including those of ministries other than the MoE) accounted for about 9.2 percent of total expenditures but enrolled only 0.3 percent of all students (World Bank 2012b).

While systematic data are hard to obtain, the evidence suggests that TVET systems often underspend in some areas critical to improving performance and overspend in others. Direct analysis of spending effectiveness and efficiency is complicated by the lack of expenditure reviews for most TVET systems in L/MICs. Still, the coexistence of fields of study with low labor demand and others with high demand makes resource misallocation evident. The former fields of study crowd out much-needed resources for the latter in such areas as teachers, curricula, equipment, and infrastructure. For example, in the Pacific Islands, the overwhelming share of annual expenditure on TVET is absorbed by recurrent costs (salaries, operating costs, and overhead), from 81 percent in Vanuatu to 96 percent in Fiji (Palmer 2017). Similarly, in Kenya, the smallest expense items were professional development and equipment maintenance, with 60 percent of institutions reporting not having sufficient or fully functional equipment for all students (World Bank 2017a). In North Macedonia, the financing available is used mainly for salaries, student transportation, and heating, leaving only a small portion for development (World Bank 2014b). Training institutions participating in TAP in Romania reported that, while budgets were generally adequate for the maintenance of physical infrastructure and equipment and for staff professional development, they were not adequate for capital investment and monitoring, evaluation, and research (World Bank 2022a).

There can be some inefficiencies in expenditure that push up per-student costs for formal TVET. For example, in the Central African Republic, in 2008 33.5 percent of total non-salary current expenditure went to office supplies and maintenance, the highest of all education sectors. Low pass rates can signal internal inefficiencies: in Lesotho, Malawi, and Zambia, the average pass rates in publicly provided TVET were about 50 percent, with zero pass rates for courses like auto mechanics at one institution in Lesotho and cabinet making in Malawi (UNESCO 2013). Training institutions in three cities in Kenya reported average completion rates of 73 percent for their most popular program and 68 percent for the next most popular (World Bank 2017a).

Spending on TVET and reliance on different funding sources varies between and within L/MICs

There is often very little data and transparency on TVET funding and costs. The diversity in sources and flows makes it difficult to get a full picture of funding, especially

from nonpublic sources that do not flow through the state budget. Even at the national governmental level, data on funding amounts, destinations, and expenditures may be opaque when data from different ministries are not consolidated, or when budgets do not distinguish allocations to TVET from those to general education, or no information is collected on the types of expenditure for which funds are used after they have been transferred to TVET institutions (Hanni 2019; ETF 2018). Difficulties in identifying TVET expenditures by households, firms, and administrations exist across countries at all income levels, with data on employer expenses and private TVET providers often being particularly hard to get (Ball 2005). When data do exist, they may not be fully comparable between countries, given both challenges in data collection and differences in national definitions of TVET. Notwithstanding the data challenges, however, the information that is available shows that how TVET systems are financed differs greatly by country, with a heavy dependence on public finding being a recurring feature among L/MICs.

Formal TVET systems in L/MICs tend to rely overwhelmingly on public funding. In Latin America, for example, funding for formal TVET comes mostly from national governments, resources generated through general taxation, or sometimes tax instruments earmarked for education or TVET (Hanni 2019).[28] Similarly, government funding is reported to be the main source of formal TVET financing in countries as diverse as Albania, Armenia, North Macedonia, Malaysia, Sri Lanka, and Yemen (World Bank 2014a; 2014b; 2014c; 2014d; 2014e; 2013a). Private sector funding tends to play a strong role in systems that rely heavily on apprenticeships as enterprises bear a substantial share of the costs of the in-company training. However, such systems are rare in L/MICs.

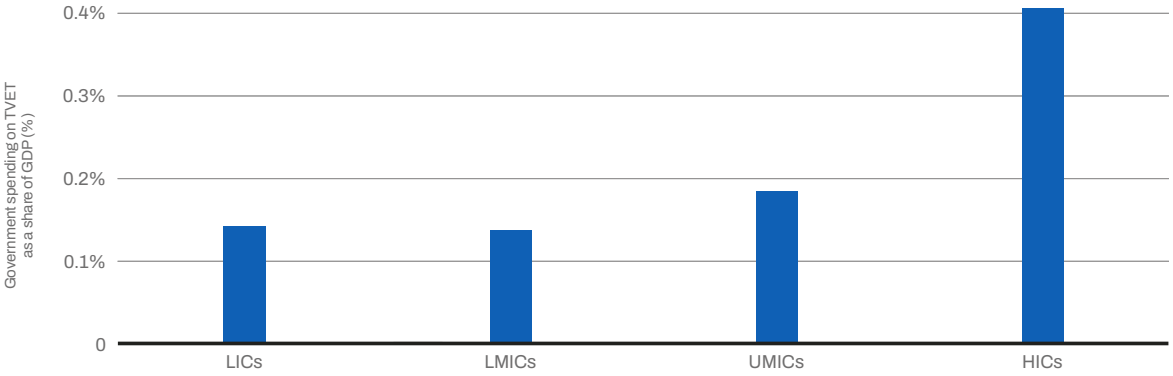
As could be expected, public TVET institutions typically rely more on government funding than private providers. Across East Asia and the Pacific, public TVET institutions tend to rely mostly on government funding, while student fees and other non-public sources provide most funds for private providers (Palmer 2017). In the Philippines, public TVET providers receive almost 95 percent of their funding from the Technical Education and Skills Development Authority (TESDA); private providers receive 4–6 percent of their resources from TESDA but rely mostly on student fees. In Mongolia, public funds provide 95 percent of the budgets of public vocational schools; in the Pacific, private providers receive most of their funding from student fees (Fiji, Solomon Islands) or NGOs and religious organizations (Samoa) (Palmer 2017; 2015a; 2015b). A similar pattern is likely in other regions.

Public funding for formal TVET varies considerably. At less than 0.2 percent of GDP on average, general government spending on TVET is much lower in L/MICs than in HICs (0.46 percent) (Figure 7.3). However, this obscures significant heterogeneity within income groups and between and within regions, with countries as diverse as Bosnia and Herzegovina, Costa Rica, Mali, Serbia, and Türkiye spending more than 0.5 percent of their GDP on TVET (Figure 7.4). In Latin America, government spending on secondary TVET in Costa Rica (0.71 percent of GDP) is almost 8 times higher than in Guatemala (0.09 percent). However, differences between these two countries are much smaller when

28 While the use of payroll taxes to fund skills development is widespread in Latin American countries, the proceeds tend to be allocated to non-formal TVET.

spending on TVET is considered as a share of total public outlays on secondary education, which was about 22 percent in Guatemala and 30 percent in Costa Rica (Hanni 2019). Expenditure on secondary and post-secondary vocational education as a share of total public education spending generally rises with country income (Figure 7.4). There are, however, exceptions. For example, Niger, a low-income country, spends 13 percent of total government expenditure on vocational education despite having only 1.5 percent of its learners enrolled in such programs.

Figure 7.3: Government Spending on Vocational Secondary and Post-secondary Non-Tertiary Education Is Relatively Low in L/MICs

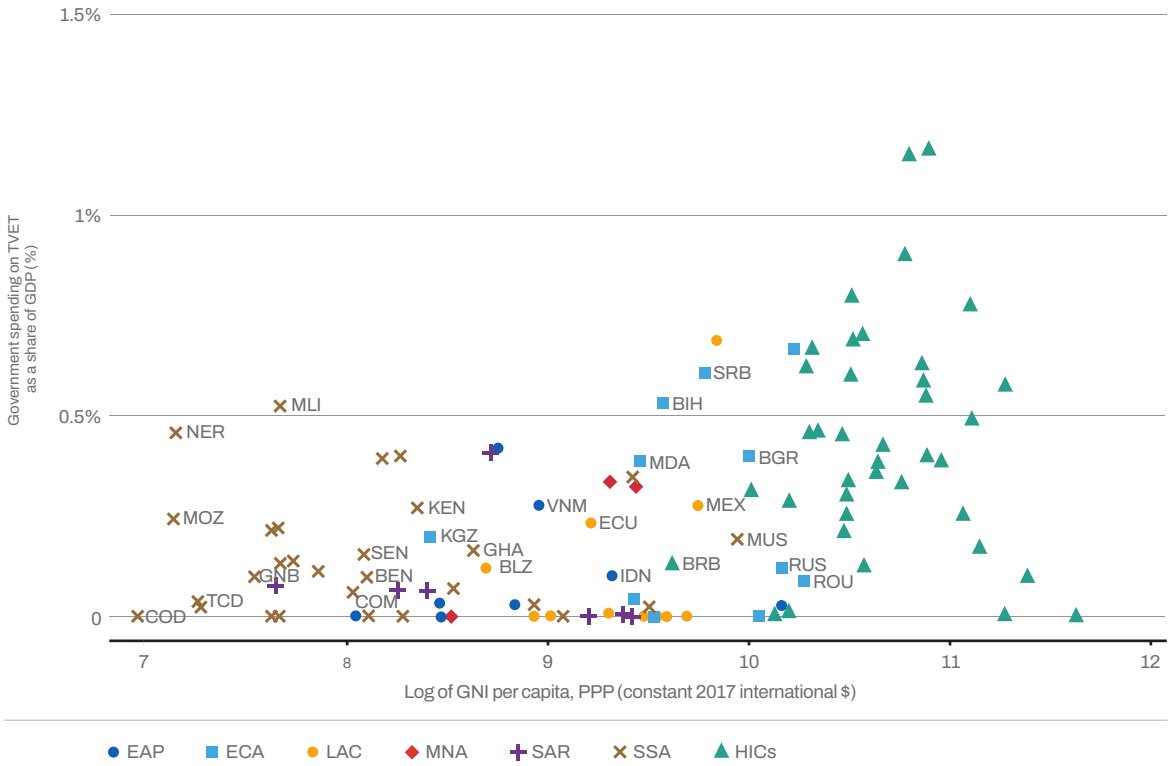


Source: UNESCO Institute of Statistics data.

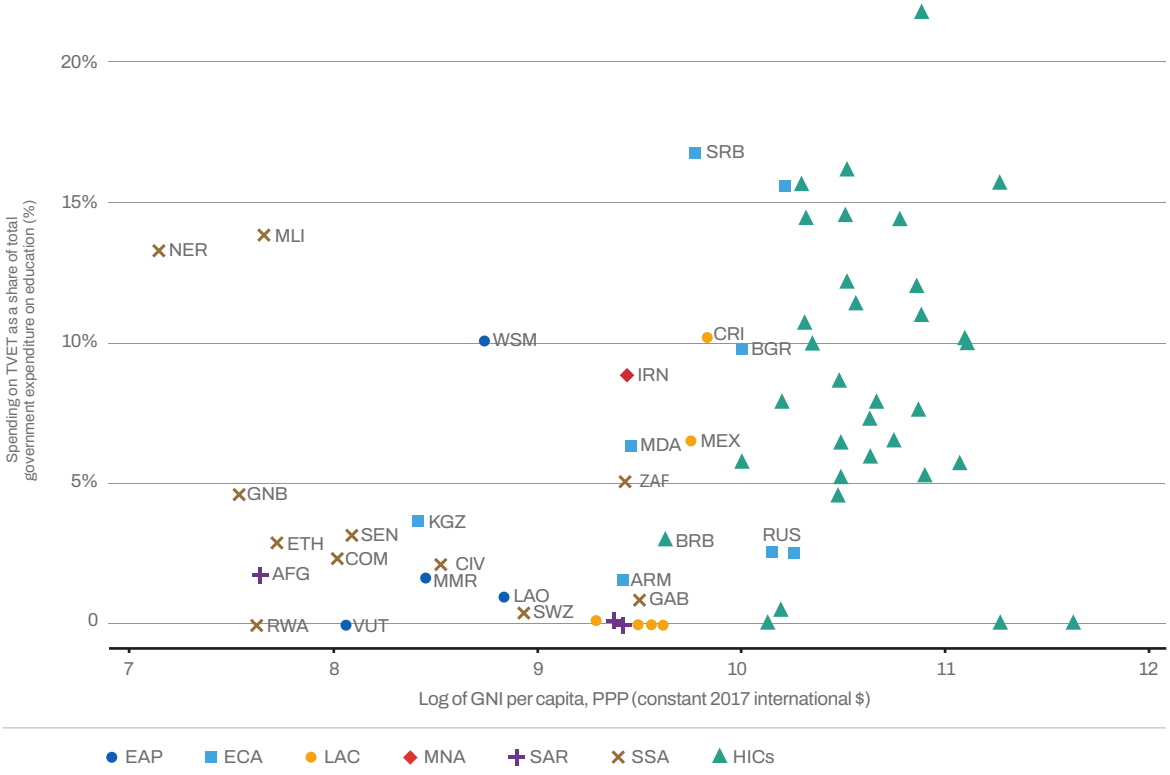
Note: Covers L/MICs with latest available data for the period from 2011 to 2022. Data cover general (local, regional, and central) government spending on secondary and post-secondary non-tertiary vocational education (current, capital, and transfers, including from international sources) for 91 countries: 19 LICs, 15 LMICs, 20 UMICs, and 37 HICs. LICs = Low-income countries, LMICs = Lower middle-income countries, UMICs = Upper middle-income countries, HICs = High-income countries.

Figure 7.4: Government Spending on TVET Varies Considerably

A) As a Share of GDP



B) As a Share of Total Government Spending on Education



Source: UNESCO Institute of Statistics data.

Note: Covers L/MICs with latest available data for the period from 2001 to 2022. The World Bank income group classification is based on GNI per capita in current US$ (using the Atlas method exchange rates); the figure uses log of GNI per capita, PPP (constant 2017 international $) in the x-axis. Data cover general (local, regional, and central) government expenditure on secondary and post-secondary non-tertiary vocational education (current, capital, and transfers, including from international sources). Values for spending on vocational education as a percentage of total government education spending are calculated by dividing the government spending on vocational education by government spending on total education when latest values for both indicators are available for the same year. EAP = East Asia & Pacific, ECA = Europe & Central Asia, LAC = Latin America & Caribbean, MNA = Middle East & North Africa, SAR = South Asia, SSA = Sub-Saharan Africa, HICs = High-income countries. See Appendix Table A.1 for country codes.

Reliance on tuition fees varies between and within countries; high fees may affect affordability and equity in access. For example, tuition fees are common in the EAP region, but their relative importance varies greatly. In the Pacific Island countries, tuition fees are estimated to provide over a third of recurrent funding of both public and private TVET, compared to less than 2 percent in Mongolian public vocational schools (Palmer 2015b). Fees provide less than 5 percent of funding for public pre-tertiary TVET institutions in the Philippines, but nearly 70 percent for for-profit private TVET providers. In Uganda, according to official data, over 40 percent of revenues of public training institutions are from fees collected from private households. The heavy reliance on household contributions may prevent disadvantaged populations from accessing public training (World Bank 2012a). In the three cities in Kenya where TVET institutions were surveyed, 79 percent of funding for the (mainly private) institutions came from tuition fees and only 13 percent from government sources (World Bank 2017a). In Zambia, where TVET institutions receive very little public funding (less than 10 percent of budgets in some cases), student fees make up the difference (Herd and Richardson 2015).

Industry co-financing of TVET is modest in most L/MICs, although there are exceptions, and in-kind contributions may be more common than financial ones. As in other parts of the world mechanisms to raise private funds for TVET are rare in countries in Central Asia and Southeastern Europe. In Tonga, 75 percent of training institutions surveyed reported that businesses do not fund any programs (World Bank Forthcoming (c)). In Kenya, although 70 percent of institutions could actively seek funding from private firms, in practice only 20 percent had some (World Bank 2017a). In Mongolia, 17 percent of TVET institutions surveyed confirmed receiving financial contributions; but 91 percent reported in-kind contributions such as work placements; 70 percent received equipment or consumables; 61 percent reported receiving technical knowledge (World Bank Forthcoming (d)). However, in some contexts, publicly funded TVET institutions, even though they are not reliant on private funding, can actively seek funding from potential employers. For example, 82 percent of VET Professional Training Schools in Albania do so, and receive contributions in the form of training facilities, equipment, and supplies (World Bank 2017b).

Training levies are the most widely used complement to central government financing of TVET (Ziderman 2016). Quite a few countries in the East Asia and Pacific have enterprise-financed training funds, which are mostly used to train current employees. An exception is Mongolia, where the TVET Promotion Fund does not reallocate funds to enterprises but provides financial support to all TVET students in both public and private TVET institutions (World Bank 2016c). Several countries in Northern Africa also operate levy-based training funds that finance formal TVET (Johanson 2019). In some countries, formal private sector contributions to TVET are mandatory, usually through payroll taxes. For national training funds financed through a payroll levy, the average levy in 2020 was 1.3 percent, within a range of 0.05–4 percent. About 25 percent of these funds rely on payroll levies of less than 1 percent, and over 60 percent on levies of 1–2 percent (UNESCO 2022). The proceeds are mainly used to support mostly formal public training and supervisory and coordinating bodies, with an emphasis on initial training. Training levies help diversify TVET sources of funding and can be a stable and protected source. To the extent that they finance training that benefits levy-contributing firms, payroll levy schemes may be considered an efficient form of cost sharing (Ziderman 2016).

However, training levies increase the cost of labor and often displace public funding. Mandatory contributions increase the cost of labor for contributing firms (mostly large, formal forms), and can lead to segmentation and other distortions. Given the structure of labor markets and the challenge of creating high-quality jobs (often formal) in L/MICs, these distortions can be significant. If contributing firms view such levies only as a tax, it could hurt formal job creation (ILO 2020c; Packard et al. 2019; Pages 2017; OECD 2011). Moreover, the expectation that levy income would complement government financing, thus providing an additional source of funding, is often not met as governments reduce their contributions (Ziderman 2016).

TVET funding in L/MICs is often fragmented. The multiplicity of sources and the variety of direct and indirect allocation and expenditure mechanisms complicate the financing.

Indeed, L/MICs are likely to struggle to achieve coherent and effective spending on TVET given the numerous government ministries and financing mechanisms, public and private training providers, households with vastly divergent abilities to pay, private training providers, WBL, and donor-funded interventions (Palmer 2017). In Malaysia, for example, funding for both initial and continuing TVET came from fiscal sources through taxation and taking on debt for public sector training, with various ministries and states managing their own TVET institutions, and the Skills Development Fund, managed by the Skills Development Fund Corporation, providing loans to school leavers and graduates of skills training institutions to enroll in TVET in public and accredited private training institutions. At the same time, the Human Resources Development Fund, financed through mandatory levies on companies, funded in-service training (World Bank 2013a). This example is not unusual; in many countries the picture is even more complicated as development partners also provide considerable financing.

Engagement in income-generating activities beyond formal TVET is not a common practice. By selling goods and services beyond regular training, in theory TVET providers can generate additional income. Often, such goods and services are closely linked to the providers' regular training activities and technical expertise. For example, the National Training Service of Industrial Work in Peru offers firms training programs and manufacturing services (Hanni 2019). For many TVET providers, however, resources generated in this way are a negligible share of their funds. In some countries, TVET institutions are not allowed to carry out such activities or to retain the revenues (Palmer 2017).

Budget allocation in most L/MICs is not based on outcomes, or even outputs

TVET funding in most L/MICs is predominantly input-based rather than output- or outcome-driven. Traditionally, many training programs have focused more on inputs, such as the number of individuals enrolled, salaries paid, and buildings rented, with providers expected to account only for how funding was used in these areas (Ziderman 2016). For example, the funding formula in Mongolia was based on fixed cost per student, while in Kiribati, Vanuatu, and Tonga most TVET providers received funding based on historical trends (Palmer 2017). Thus, providers do not have strong incentives to focus on outcomes by, e.g., motivating youth to attend and complete a program, providing quality training, measuring acquisition of relevant competencies, and supporting youth in accessing productive jobs. As discussed earlier, TVET systems in L/MICs regularly lack mechanisms for measuring performance and performance-based budgeting, which exacerbates inefficiencies in the system. In Armenia, for example, input-based budget processes were mostly guided by historical trends and enrollment, with limited alignment with emerging priorities (World Bank 2014a).

SECTION 7.4.
Conclusion

In many countries, TVET systems underperform in terms of their potential contribution to employment and productivity due to challenged learners, unsupported teachers, and inadequate incentives. While globally there are examples of well-performing TVET systems and programs—often in particular dimensions—it is widely recognized that TVET systems often find it very difficult to achieve their aims. Funding constraints, poorly equipped institutions, inadequately trained teachers, only tenuous links with industry, and outdated curricula and learning resources prevent many TVET systems from achieving their goals (Swartz et al. 2020; Subrahmanyam and Law 2020). This translates into difficulties providing the demand-responsive, high-quality education and training that would have the highest possible positive impact on learner employability and firm performance.

Despite some positive examples, broad-based reforms that substantially and sustainably improve TVET performance have not materialized in L/MICs. Again, data constraints complicate evidence-based comparisons over time. Yet challenges today are not very different from those identified decades ago (De Moura Castro 2008; Adams et al. 1992). These relate, for example, to outdated TVET programs that are not demand-responsive; insufficient private sector engagement; teachers who lack both technical and pedagogical skills; underfunding; fragmented governance; and a view of TVET as a place for those learners for whom there is no space or appetite in general education, rather than as a rational and attractive choice for the vocationally and technically talented.

While getting TVET right has proven difficult in most L/MICs, there are worthwhile potential benefits of a system that equips workers more effectively with the skills they need for jobs not just today but also tomorrow. The next part of this report proposes a way forward, drawing on lessons learned from previous TVET reform efforts around the world.

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PART

3

THE WAY FORWARD TO BETTER TVET

A formal TVET system should be large enough to respond to a labor market's skills demand, including entrepreneurship opportunities, and small enough to be provided with quality and with equitable access to learners who meet entry requirements. If one of these elements is absent, TVET will likely fail to meet the objectives of either individuals or the economy. Successful reforms are possible, and some will be quick wins but other elements will take time and sustained investment. International experience provides guidance and useful lessons (though too often the evidence is not robust) on what may work to improve TVET access, equity, quality, and relevance. Digital technologies can complement and facilitate some reforms, contributing to efficiency as well as resilience and sustainability; they may even allow low- and middle-income countries (L/MICs) to leapfrog in some areas of TVET.

We focus on three interrelated transformations for TVET in L/MICs – three E's:

1. From striving for recognition to striving for **Excellence**. That entails building strong foundational and labor market–relevant skills, being demand-driven and student-centered, prioritizing practical experience, investing in teachers, and strengthening TVET's ecosystem with flexible pathways.

2. From a focus on inputs to a focus on **End results**. That entails getting the right balance between provider autonomy and accountability through governance and financing mechanisms with active stakeholder engagement.

3. From decisions based on conjecture to decisions based on **Evidence**. That entails using data and evidence more deliberately at the program, institutional, and system levels to empower learners and enterprises, promote learning among TVET providers, and improve both efficiency and effectiveness.

Implementing reforms to help bring about these three transformations can, with time, reshape the TVET policy arena in L/MICs. This in turn can generate and help sustain change to support the role of TVET in contributing to employment and productivity and supporting sustainable structural transformation.

This part of the report discusses practices and evidence to inform L/MIC reform efforts on the TVET key performance dimensions of access, equity, quality, and relevance, stakeholder interactions, and system foundations. Some cases provide rigorous evidence to support a way forward; in many other cases, however, the evidence is incomplete or is still emerging, and we rely on promising practices that are grounded on solid theory of change; in yet other cases, we highlight that there is simply no strong evidence to guide policymakers one way or another. In these latter cases, we discuss the pros and cons of different approaches and the contexts in which they might be more appropriate, and options for gradual reform. The first two chapters in Part 3 focus on strategies to improve access and equity (chapter 8), and quality and relevance (chapter 9). Chapter 10 discusses ways to improve stakeholder interactions, and chapter 11 deals with reinforcing TVET's foundations—vision and strategic framework, governance, and funding and expenditures, which are all necessary to buttress more investments in TVET and support results. Chapter 12 concludes by making the case for the three transformations L/MICs need to achieve for better TVET.

CHAPTER 8.

Increasing Access and Equity in TVET: Building Stronger Foundations and Dismantling Barriers

As employment, megatrends, and progress in educational attainment in many L/MICs drive a likely expansion in TVET systems, access and equity become ever more central. This chapter discusses policy priorities to improve TVET equity in enrollment, choice of fields of study, and completion, as well as graduates' transitions to the labor market. To address the main challenges identified in part 3, the proposed policy agenda focuses on 1) building cognitive and socioemotional—foundational—skills before and during TVET and 2) addressing the market, institutional, and policy failures that prevent many from accessing TVET and certain occupations, or that make it difficult to transition smoothly from studying to employment. In discussing lessons from international experience in these areas, the chapter looks especially at the challenges faced by learners who are women or who come from disadvantaged backgrounds.

SECTION 8.1.
Strengthening Foundational Skills

It is the role of the early and basic education system to ensure that students who enroll in TVET have at least a minimum level of foundational skills and have the motivation and aptitude necessary to succeed. Foundational skills are important per se because employers seek them but they are also needed for further learning and for adaptability (Obiakor and Newman 2022; Arias et al. 2019; World Bank 2018d). Enrolling in TVET students who are not ready or who do not have an aptitude for technical and vocational education can waste the resources of both the learner and the system.[29] It can also accentuate negative perceptions of TVET as a second-tier track, which can then discourage other potential students from enrolling or firms from hiring TVET graduates. A system that de facto becomes remedial will not be able to achieve excellence and, hence, will not be able to deliver on the promise of TVET (UNESCO 2015c).

29 See, for example, recent experimental evidence from Finland, where the largest TVET returns occurred among those who expressed ex-ante a preference for vocational education (Silliman and Virtanen 2022).

Ideally, foundational skills are mostly acquired in basic education and learners do not enter TVET until those skills are in place. TVET's success thus rests on students acquiring the necessary foundations in early childhood education and primary or lower-secondary school. Where TVET starts too early for learners to have acquired solid foundational skills, the trade-off between building technical and foundational skills becomes more central. Ultimately, both technical and foundational skills may be deficient if not enough attention is given to the basics (Laajaj and Macours 2019; Psacharopoulos 1994). As a result, L/MICs where TVET starts at the lower-secondary level—about 30 percent of them, mainly in Sub-Saharan Africa and Latin America and the Caribbean—benefit from delaying TVET until upper-secondary.

Delaying entry into TVET and hybrid secondary education programs

Several countries have delayed entry into TVET to strengthen foundational skills. Delaying TVET entry, extending students' exposure to a general academic education, and increasing their time on task on basic competences (reading, mathematics) could improve outcomes, as demonstrated by studies using natural experiments of system-wide reforms. In Poland, for example, delaying vocational education by a year improved students' academic performance by about a standard deviation (Jakubowski et al. 2016) although this reform was later reversed. In Norway, "Reform 94" integrated more general education into the vocational track, offered vocational students a pathway to college, and increased access to apprenticeships. The reform improved social mobility, particularly for disadvantaged men (Bertrand et al. 2021).

As with most reforms, delaying entry into TVET needs to consider the entire system to avoid such unintended effects as increasing the likelihood of dropping out of education altogether. In Brazil, attendance of oversubscribed technical high schools led to lower dropout rates than in general high schools with similar characteristics (Elacqua et al. 2019). While other recent evidence on this is scarce, a quasi-experiment based on the 1970s reform in Croatia that delayed early entry into TVET and extended the general curriculum in vocational training found a higher probability of males dropping out of high school and not completing university (Zilic 2018). In these contexts, as probably also in others, a segment of the population that is not interested or able to attend general education would leave education earlier if there were no technical track. This suggests that it may be important to implement only gradually any reforms delaying entry into TVET, in tandem with measures to support groups at risk of dropping out.

Alternatively, some countries have effectively created a hybrid secondary education track for students interested in TVET. In Colombia and Mexico, for example, the emphasis on job skills in general education has increased (Maclean and Pavlova 2013). In Brazil, two types of upper-secondary TVET combine general and vocational course content: The first offers academic and vocational courses as one program in the same secondary school; the second allows general upper-secondary students to simultaneously pursue a complementary technical program, usually in a separate school (Almeida 2016). In India, in lower secondary, pre-vocational education is designed to make students aware of the concept of work (Maclean and

Pavlova 2013). In this context, a national scheme, including financial assistance for education providers, promotes thinking of secondary education in terms of vocations. As of March 2018, more than 8,000 public schools had been approved for the program. Vocationalization of secondary or post-secondary education could be a way to keep some students engaged in education longer (Maclean and Pavlova 2013). One concern for these programs, however, is to continue stressing foundational skills and avoiding an excessive and premature focus on technical skills. The experience of advanced economies, where upper-secondary vocational education is being made more general so that vocational students receive more academic content to broaden their occupational focus, illustrates the importance of achieving an appropriate balance between technical specialization and transversal skills (Maclean and Pavlova 2013).

Remedial programs and building foundational skills during TVET

Since reforming basic education will take time, education systems need to be prepared to provide accelerated remedial support either before learners enter TVET or at the start of TVET. Adequately identifying needs and offering tailored support to those with significant gaps may require assessing foundational skills when learners enter TVET. To provide support to under-prepared students, the use of tutors has shown potential in other parts of the education system (Robinson et al. 2021). Targeted bridging programs that help build foundational skills before enrolling in TVET could also help. In the United States, community colleges offer such remedial programs since it is estimated that two-thirds of incoming students lack the foundational skills to complete TVET programs successfully (OECD 2014b). While there is no robust evidence on the effectiveness of bridging programs in L/MICs, an example of this promising practice comes from Cambodia, which carried out a series of Skills Bridging Program pilots to provide out-of-school youth with the academic competences to qualify for entry into certificate programs in technology; of more than 900 learners participating, 70 percent passed the final assessment and 60 percent moved on to certificate programs (Norton and Norton 2013). In these remedial efforts, technology can be of help, borrowing from general education experience with using adaptive technology to provide specific instruction according to the levels of student skills (World Bank 2021d; Muralidharan et al. 2019).

Remedial programs can also be coupled, as needed, with psychosocial support. This may be particularly helpful to disadvantaged students, for whom programs focusing on social belonging—feeling of social and academic fit—have been found helpful in tertiary general education (Murphy et al. 2020; Walton and Cohen 2011). One such program offered in South Africa's TVET colleges consists of workshops that use role play, simulation, self-reflection, discussion, and group tasks, with annual feedback from students to inform improvements. Participants followed for three years after the program were found making better choices and lifestyle changes and reporting better interactions with peers (Papier and McBride 2019). However, such programs are not only rare but tend to remain peripheral to the system.

Foundational skills should continue to be developed through secondary and post-secondary education, so TVET programs should reinforce them as they build technical skills. There are two general approaches for integrating foundational or transversal skills into TVET curricula, as illustrated by promising practices in the East Asia and Pacific region. The first is to identify stand-alone subjects, such as Malaysia's Industrial Training on Soft Skills module in polytechnics, which exposes students to the theoretical underpinnings of transversal skills before their practical training (UNESCO 2015a). The Philippines is another example where "basic competencies" (including communication, teamwork, problem-solving, and others) are a required component of all TVET programs. While they are not separately assessed during the national assessment process, TVET institutions are required to assess basic competencies themselves (Brewer and Comyn 2015). The second approach entails integrating the acquisition of foundational or transversal competencies into technical subjects, as in Vietnam's Hung Yen University of Technology and Education, which trains students in time management and prioritization through flexible and positive teaching methods (UNESCO 2015a).

If the intensity of foundational competencies in a TVET program is sufficiently high, there may be value in awarding dual degrees. Graduates of Mongolia's 2 to 2.5 year TVET programs, which offer a mix of basic academic courses and vocational training, obtain both a secondary education diploma and a vocational education certificate (Field et al. 2019). In Bulgaria, formal TVET programs at the secondary level combine general education and TVET; upon completion, learners receive a general secondary education diploma (allowing access to higher education) in addition to a TVET qualification certificate (CEDEFOP 2018). In Costa Rica, similarly, upper-secondary TVET programs have the academic content required for a national school-leaving/university entrance exam (Field and Guez 2018). While approaches like these give TVET graduates pathways to progress into academic tertiary education, it is important to ensure that the study load remains manageable.

SECTION 8.2.
Addressing Other Barriers to Access and Equity in TVET

Countries have taken a variety of approaches to address other barriers to TVET access and completion, particularly for disadvantaged groups, and these experiences can offer useful guideposts for countries where this agenda is lagging. These include the use of early warning systems to identify and support students at risk of dropout, addressing financial and information constraints, closing gender gaps, addressing the diverse needs of learners, and fostering resilience.

Early warning systems

Improving access and completion requires a coherent policy package to address a multiplicity of constraints, and to target some measures to the specific needs of critical groups. Policy action does not need to wait until issues materialize. Early warning systems that build capacity among institution leaders and teachers on how to support students at risk of dropping out or not learning, identify these students, and support them with targeted interventions are in widespread use in HICs (O'Cummings and Therriault 2015; European Commission 2013), and are being adapted to other settings. For example, Guatemala established such a system in primary schools, reducing the dropout rate in the transition from primary to lower-secondary school by 9 percent for program compliers (Haimovich et al. 2021). Although the effect size is modest, the low cost of the program (estimated at less than US$3 per student) and successful scale-up make this a promising approach for reducing dropout in L/MICs and can easily be expanded from basic education to TVET when supportive information systems are in place.

Addressing financial constraints

The first item on this agenda is improving affordability for those most in need. Liquidity and credit constraints can be a barrier to accessing TVET, particularly for the most vulnerable. Constraints are likely to relate to the opportunity costs of attending TVET as much, if not more, than the direct costs, since many disadvantaged youths need to work to support their families. Several impact evaluations of programs for improving access to TVET for disadvantaged youths have shown that subsidizing the cost increases enrollment. In Kenya, giving out-of-school youth vouchers for vocational training substantially increased enrollment, and beneficiaries acquired on average an additional half year of education (Hicks et al. 2015). In this context, fees even at the most affordable public TVET schools represented an estimated 15 percent of annual household expenditures per capita. In Côte d'Ivoire, a monthly subsidy of half the minimum wage increased the share of youths in formal apprenticeships, mostly in informal firms, by 53 pp by partly offsetting the foregone labor earnings (Crépon and Premand 2019).

TVET costs can be subsidized in a variety of ways. Scholarships and financing for vulnerable youths that allow recipients to pick among recognized providers, whether private or public, can increase enrollment of specific groups (Millennium Challenge Corporation 2018). Brazil has an established voucher system for low-income students in public secondary education to attend private or public TVET; if applicable, it covers transportation, course materials, and meals in addition to tuition (Portela et al. 2015; Silva et al. 2015). In El Salvador, providing scholarships to disadvantaged youth to attend secondary technical schools increased enrollment, grade completion, and grade progression rates. The impact was mainly on men, with scholarships possibly helping overcome the stronger social incentives of male students to emigrate or find low-skilled work to provide for their families (Campuzano et al. 2016). In Bangladesh, stipends of about US$10 a month (the minimum needed to cover out-of-pocket

daily expenses for educational activities) were provided to disadvantaged students, including all female students in public polytechnics that were selected to benefit from a broader package of interventions to improve TVET performance. Students receiving a stipend had to maintain 75 percent annual attendance and 50 percent pass marks in the annual examinations. The interventions increased female enrollment in short courses from 5 percent at baseline to 32 percent at completion (World Bank 2019a).[30] For post-secondary TVET, credit schemes may be most appropriate. Here the experience of designing student loans for tertiary general education, particularly income-contingent ones, can be instructive (Arias et al. 2019).

Inclusion can also be supported through mechanisms that finance institutions directly. Governments could pay institutions a premium for enrolling and graduating disadvantaged students as part of performance-based financing. As we discuss in chapter 11, this is done increasingly for non-formal or informal training (Clarke et al. 2021; World Bank 2020). Where there is a public policy interest in fostering specific fields of study (e.g., science, technology, engineering, and mathematics (STEM)) or specific modalities (e-learning) that can be more expensive than the average program (particularly initially) but can have social benefits beyond those accruing to individuals, a combination of subsidies for individuals and for institutions/programs may be most effective. One promising example is the E-Tec Network in Brazil, which provides financial assistance to institutions looking to expand their distance learning TVET courses (Portela et al. 2015).

Addressing information constraints

Providing better and more accessible information can help make TVET more inclusive, particularly given the great variation of outcomes among TVET graduates. In addition to financial constraints, information asymmetries can keep potential students out of TVET or send them into unsuitable programs. As discussed in chapter 4, many youths and adults in L/MICs are excluded from TVET altogether or are de facto segregated into occupations with low payoff or into TVET institutions or programs of low quality and relevance.

The evidence suggests that providing quality, relevant, and timely information on TVET and general education offers and pathways, labor market returns to different tracks and programs, and career expectations, can be helpful, particularly for the most disadvantaged and for women, who often have weaker labor market networks. In Kenya, more accurate information on the earnings of different occupations led to a switch, especially among women, to TVET fields of study with higher earnings (Hicks et al. 2011; 2015). Similarly, in the Republic of Congo, providing information on trade-specific earnings to vocational trainees increased women's likelihood of applying to a traditionally male-dominated trade by 28.6 percent (Gassier et al. 2022b). Men and women were also both more likely to apply to more lucrative trades. The main mechanism for these impacts, even more than filling information gaps, was to make the

30 During the early stages of implementation, an initial focus on students coming from poorer households was widened to include all female students, because most female students were from less-disadvantaged households than male students in a context in which only privileged families would even consider sending their daughters to post-secondary education.

information on returns more salient in the decision process of applicants. This finding is consistent with a broad literature suggesting higher and more sustained impacts for interventions engaging students directly and intensively, for instance through repeated counseling sessions, and in a customized way (Ferreyra et al. 2021).

Career and academic guidance can both address information asymmetries early on and help students overcome barriers post-graduation. Effective career guidance can help individuals to reach their potential, economies to become more efficient, and societies to become more equitable (CEDEFOP et al. 2021). Career guidance and counseling can be very useful for TVET learners as it can inform their aspirations, particularly for disadvantaged students (UNESCO 2018d). TVET graduates sometimes know little about opportunities to pursue further qualifications and may lack information about higher education programs. Career guidance should be available at all relevant decision points, and on exit from TVET to support transition to the labor market or pursuit of further education. In the context of economies that are very dependent on self-employment, career guidance also means connecting learners to networks and mentors, business development services, financing, and start-up capital to help support the transition (Jayachandran 2020). This type of support can be very complementary to technical training, as the evidence suggests.[31]

While still often a weakness in many systems, several countries are strengthening their career guidance support to TVET students (GIZ 2020). Technology tools that are sensitive to the constraints and needs of the most vulnerable can be useful here. Interactive career pathways toolkits and career education platforms are some of the tools available (World Bank 2021d; ILO and UNESCO 2020). An interesting recent experience in this area comes from South Africa, in the context of reaching out to disadvantaged youths in the slums to link them to apprenticeship opportunities as part of the Youth Employment Service (YES). Using an online app accessible through mobile phones or in established centers in the slums, youths can assess their skills using games and receive a list of suggested occupations based on their strengths and weaknesses, as well as a list of relevant training opportunities to improve their skills. The tool has been found to increase job search behavior and effort, at least in the short run (World Bank 2022c). After graduation, career guidance—including through public employment services— continues to be important, particularly for the most disadvantaged. For example, the Government of Kenya is launching a gateway that offers a wide range of information on labor market demands and training opportunities serving learners, teachers, providers and employers.[32] Yet, more than 60 L/MICs worldwide provide no such services for job seekers (World Bank n.d.a).

Conveying accurate information on the costs and benefits of TVET and addressing negative stereotypes about particular fields of study or trades should be used to attract students with the appropriate skills and aptitudes. While learners should not be enticed into TVET with promises that will not be met, there are countries where TVET has positive labor market returns but suffers from a poor reputation among the public

31 This type of complementarity is increasingly explored in non-formal training programs but can be informative for formal programs as well (Cheema et al. 2019).

32 See https://www.nationalskillsgateway.go.ke/index.html.

or for particular population groups (like women). In these contexts, image-promoting activities, such as social marketing campaigns and skills competitions, should address underlying reasons for the perceived lack of attractiveness of TVET. Explicit efforts to change cultural perceptions and boost the image of TVET have been made, for example, in Bangladesh, through a "TVET Week," during which TVET was promoted through a variety of channels including print media, film, radio, social media, and events (Clement 2014). Awareness-raising campaigns in Bangladesh saw intake capacity in supported diploma courses increase from 55 percent at baseline to 99 percent at completion (World Bank 2019a). Participation in competitions, such as the World Skills Competition, can also spur public interest and appreciation for TVET (Clement 2014).

Where TVET systems are less well-developed, efforts are better targeted at those elements of the system where the gap between performance and perception is greatest. This can mean directing image-promoting activities to a few strong sectors or programs. In Angola, for example, a campaign to promote the image of masons, targeting young people, their families, and employers, was carried out through rap songs aired on TV and posted online.[33] In Mongolia, a national reform process was accompanied by a TV reality show titled "My profession is a welder," to boost the image of the profession (Clement 2014). In other contexts, it can be appropriate to focus on one or more TVET institutions. In Albania, for example, to attract more learners to six vocational schools in the country as part of a broader reform program (2010-2017), posters and brochures were distributed to prospective learners and their parents (Clement 2014).

Closing gender gaps

In many countries, particular attention needs to be paid to closing TVET gender gaps. Public policies can help do this in at least two related areas: participation in and completion of TVET; and enrollment in TVET fields with high returns, even if traditionally male-dominated.

In terms of participation, secondary education often coincides with the time when women in some parts of the world start families, which can make it difficult to continue their education, general or technical (Birchall 2018; Honorati 2015). Cash transfers and information programs have been shown to support the continuation of education and delay in family formation (Bergstrom and Ozler 2021). Exploring options for providing childcare arrangements for female students who need it, as in a number of non-formal TVET programs serving vulnerable groups, can help (Beegle and Rubiano-Matulevich 2020). While social and cultural norms can play a role in women's participation in TVET or selected fields, the decision to enroll in and complete a program will also be influenced by the expected labor market returns. Understanding these returns can help change education investment decisions, particularly for women (Gassier et al. 2022b; Hicks et al. 2011; 2015; Jensen 2012). Moreover, it is important for TVET to offer a safe and inclusive learning environment for women. This could include, for instance, close circuit cameras, separate dormitories (if relevant), separate leisure rooms and washrooms, and a teaching force where women are strongly represented (World Bank 2019a).

33 See www.formpro-angola.org/pt/article/73.pedreiro.html.

In terms of fields of study and occupation choice, personal preferences and future work prospects are often rated as most important when choosing coursework in TVET (Buehren and Salisbury 2017; Gassier et al. 2022a, 2022b). Effective approaches to attract women into male-dominated, higher-paying programs and careers can be mainstreamed in TVET. Relevant experiences can be found in efforts to increase enrollment of women in particular fields, such as STEM (Hammond et al. 2020; UNESCO 2020; Henninger et al. 2019). Beyond providing more information on returns, mentors and role models could be used more systematically, particularly where TVET is seen as a track mostly for men (Gassier et al. 2022b). A study in Ethiopia found that the strongest predictor of a young woman's decision to enroll in male-dominated technical and vocational courses is her relationships with people who work in the associated trade. Similarly, in the Republic of Congo, the impacts of providing information on trade returns were three times larger among women who had a male role model, even though the information did not impact their expectations of earnings in male-dominated trades. Addressing similar gender gaps in the labor market will also be relevant to change perceived and actual returns to TVET (Campos et al. 2017b; Alibhai et al. 2015). Interventions can not only benefit women but also have high societal payoffs in fields with unmet demand.

Addressing other constraints, such as care obligations, and improving women's experiences in the labor market can also address gender gaps in TVET. Expected returns are also determined by expected costs, and the childcare and family responsibilities that overwhelmingly fall on women make it less attractive for them to participate at full potential in the labor market and to make investments to do so more productively (Vuri 2016; Cho et al. 2015; Glennerster et al. 2011). Investing in affordable quality child and elder care can not only provide new job opportunities for men and women from vocational and technical education but also indirectly help close the TVET gender gap. Finally, in addition to higher female enrollment and completion of TVET, complementary interventions to improve hiring practices and the workplace environment may be needed to improve women's labor outcomes (Ricou and Moore 2020).

Addressing increasingly diverse needs through flexibility

Making TVET more accessible and inclusive also calls for making the supply of it more flexible, to better accommodate the needs of a wide and diverse student body. For people with disabilities, TVET is often out of reach, offered separately from "regular" TVET, and often of lower quality. Promoting the inclusion of men and women with disabilities in mainstream TVET requires a range of actions, from enacting and implementing enabling regulations and addressing misconceptions and discriminatory beliefs and practices to adapting entry criteria, materials, teaching, evaluation, and infrastructure (ILO 2017c). Many individuals are far from TVET centers that could cater to their needs. Rigidity of delivery is also an issue. Flexibility in course length (leading to modular or full qualification), timing (night, day, weekends), delivery mode (face-to-face, remote, or blended), and attendance (part versus full time) can help improve access to TVET. A lack of flexibility primarily affects the most vulnerable, who need to work while taking courses, or women, who bear the brunt of household duties

and childcare. Sometimes providing more choices of location and times of training will be possible; at other times it will be too costly. As digital skills and technology access improve, technology can be useful in increasing flexibility through distance learning (World Bank 2021d). For example, the Punjab Skills Development Fund (PSDF) has a partnership with Coursera to offer 13 specialized, certified courses with universities and companies, mostly focused on digital skills, including digital marketing, finance, and software, with stipends received upon completion of the courses.[34]

Recent innovations in education, often harnessing the power of digital technologies accelerated during COVID-19, further point up what is possible. Compared to other sub-segments of the education system, TVET in L/MICs has generally been slow to exploit technological innovations, but the COVID-19 pandemic catalyzed, at least temporarily, the use of new approaches. The pandemic spurred TVET institutions to provide distance learning, although the trend was most noticeable in UMICs. While distance learning primarily focused on theoretical coursework, some providers also managed remote acquisition and assessment of practical skills. Where possible they used online platforms such as massive online open courses (MOOCs) and the Modular-Object-Oriented Dynamic Learning Environment (Moodle), video tutorials, live video conferences and simulators. The use of offline platforms, including national television channels, to disseminate practical knowledge was reported in the Democratic Republic of Congo, Madagascar, and Pakistan. For assessments, TVET institutions in Ecuador reported that students uploaded videos and photos of work they completed at home. In Trinidad and Tobago practical skills were at times assessed based on portfolios submitted online (ILO et al. 2021). Virtual work-based learning, as applied during the pandemic in some HICs in the finance, IT, and marketing sectors, could be expanded to other countries and more sectors (Hoftijzer et al. 2020).

An increasing number of countries are looking into making TVET "stackable" to support flexibility through, for example, micro- and nano-credentials and digital badges that make TVET more modular and build more aggregated certifications and qualifications. Making TVET stackable, with sequential learning blocks that lead to completed courses and qualifications but that do not need to be done one right after the other, is seen as a possible way to improve the labor market prospects of TVET students (Shapiro et al. 2020; Bailey and Belfield 2017).[35] More modular programs can also reduce the inefficiencies associated with early dropout from longer programs. Although the impact of such programs has not yet been properly tested in the L/MIC context, evidence from the United States is promising. In the Wisconsin Technical College System, learners who choose the stacking option and first earn a certificate are more likely to complete their final degree than those who choose the regular option (Kiddoo 2017). In Virginia, additional community college credentials have large and positive effects on employment and wages (Meyer et al. 2022).

The development of micro-credentials is further ahead in advanced economies. In the United States, for example, close to 20 states have allocated funding for community colleges to develop stackable credential pathways, and many states have

34 See Punjab Skills Development Fund (https://www.psdf.org.pk/).

35 See also the 2020 EU Skills Agenda (https://ec.europa.eu/social/main.jsp?catId=1223&langId=en).

already implemented them (Ferreyra et al. 2021). Micro-credentials can also be digital, with digital badges that describe the skill content of the certification and the certifying authority and that can be posted on job platforms or on social networks (UNESCO 2018a). In the United States, the Colorado Community College system offers digital badges for skills such as drill press, manual machining, and computer numerical control turning, which can be stacked toward an associate degree (Ferreyra et al. 2021). IBM issues digital badges (for skills such as design thinking, data analytics, and program management) that can be used toward certificates and degrees, including bachelor's and master's, at Northeastern University (Ferreyra et al. 2021).

Some of these practices hold promise for L/MICs as well: As a changing labor market increasingly rewards skills difficult to certify in traditional ways or too new to be mainstreamed into the formal TVET system, micro-credentials are becoming particularly relevant, even more so for the most vulnerable who cannot afford degrees that take a long time to complete or require long hours.The Philippines (TESDA 2021) and Sri Lanka (Hoosen et al. 2021) are examples of countries that are adopting micro-credentials, including digital ones, in ways that allow them to recognize prior learning outside of the formal TVET system. In the Philippines, the Technical Education and Skills Development Authority has recently published guidance on recognizing or launching micro-credential courses, building on its experience of providing online micro-credential learning in TVET for more than 1 million adult learners during the pandemic (TESDA 2021). The early adopters will generate important lessons for other L/MICs.

Adding flexibility to increase access to TVET requires linking formal, non-formal, and informal programs. Despite the prevalence of informal and non-formal TVET in many L/MICs, this part of the system is often disconnected from formal TVET. Of concern is the lack of certification of learning in informal or non-formal programs or on-the-job training, including informal apprenticeships, even though many workers are likely to have acquired important, job-relevant skills through such programs.

Consequently, countries are making efforts to draw up recognition of prior learning (RPL) schemes for skills acquired in the workplace or through informal or non-formal TVET programs.[36] In Brazil, citizens can validate professional knowledge acquired in the workplace or in formal or non-formal studies conditional upon the enrollment of the individual in continuing education.[37] In Nepal, the government subsidized skills tests for RPL for about 29,000 workers from 2011 to 2017, of which 16,400 succeeded in obtaining certificates (World Bank 2017a). In South Africa, most higher education institutes accept RPL for admission (Aggarwal 2015). In India, more than 5 million individuals have already been certified via RPL in the Pradhan Mantri Kaushal Vikas Yojana program.[38] In some countries, RPL programs provide supplementary skills training opportunities to fill identified skills gaps. India, for example, offers bridge courses to RPL candidates along with training on socioemotional skills and job-related safety and hygiene practices.[39]

36 See Global Observatory of Recognition, Validation, and Accreditation of Non-Formal and Informal Learning (https://uil.unesco.org/lifelong-learning/recognition-validation-accreditation).

37 See TVET Country Profiles: Brazil (https://unevoc.unesco.org/home/Dynamic+TVET+Country+Profiles/country=BRA).

38 See https://www.pmkvyofficial.org/public/index.php/home-page#, accessed March 30, 2022.

39 See https://www.pmkvyofficial.org/public/index.php/home-page#, accessed March 30, 2022.

RPL can make a difference. In Bangladesh, a randomized control trial of a RPL process for the lowest level of technical skills found that RPL increased the probability of finding employment by seven percent, increased earnings, and improved workers' confidence in their skills and jobs. These impacts were found to be larger for women than for men. RPL also increased the chances of finding work through formal job search channels and at formal and larger private companies (Nakata et al. 2021). Similar positive results were also found in an earlier trial of RPL in India on income opportunities, occupational safety, social status, and openness to further learning (Rothboeck et al. 2018). This is consistent with other studies finding that skills certification, when seen as valuable by the private sector, can be a cost-effective investment (Abebe et al. 2021; Abel et al. 2020; Bassi and Nansamba 2019; Carranza et al. 2020; and Pallais 2014).

Fostering resilience in TVET

To foster resilience in TVET in preparation for future disruptions, investments to support learning continuity during crises are central to advancing equity. As discussed in chapter 1, the COVID-19 crisis demonstrated how unprepared for crisis most TVET systems in L/MICs were, particularly in terms of learning continuity for the more disadvantaged. TVET institutions need comprehensive contingency plans that incorporate lessons learned from the COVID-19 pandemic and that facilitate a more efficient response to future crises (Hoftijzer et al. 2020). To avoid the risk of leaving many behind during periods of remote or hybrid learning, investment in digital technology and relevant skills for students and teachers is a must. Regular data should be collected on student engagement in face-to-face and remote learning and used to invest in instructional design aligned with needs. Boosting resilience in TVET also calls for strengthening students' socioemotional skills, such as self-regulation, grit, and individual resilience, which will both improve the likelihood of their completing TVET programs and increase their ability to adapt as the world of work changes (Arias et al. 2019).

SECTION 8.3.
In Short...

Making TVET more accessible and equitable will continue to be a priority for TVET systems given demographic trends and expected continued progress in secondary school enrollment and completion in L/MICs. Some formal TVET systems are likely to be too large, others too small. Whether TVET systems cater to enough learners, too few or too many depends on a host of factors that include the structure of the economy and the resulting skills demand, the organization and quality of the education and training system, and the role within it of TVET. Unless TVET quality and relevance improve, however, increased pressures in the system may worsen performance. We discuss lessons from the international experience for increasing quality and relevance next.

CHAPTER 9.

Quality and Relevance of TVET: Moving Toward Excellence

Achieving excellence in TVET requires more and better investments in such factors as the capacity of human resources—teachers, trainers, and institution leaders—reinforcing the TVET ecosystem, and a laser focus on being demand-driven. These are the three dimensions of TVET quality and relevance that this section discusses. Considering the multiple constraints of L/MICs, being selective and strategic about the design and realization of reforms can increase their efficiency and sustainability, and international experience provides several informative examples of what the reforms could look like.

SECTION 9.1.

Investing in Quality Inputs

Adequate investments in TVET staff, infrastructure, and equipment are necessary to improve TVET quality. Experience in El Salvador is a case in point: There, reforms that supported investments in teacher training, infrastructure, and equipment in selected secondary and post-secondary TVET institutions—in addition to providing scholarships to students in need — increased learning, with students in the strengthened centers achieving significantly higher scores on the Skills and Learning Assessment than students in comparable schools, with higher effects among female students (Campuzano et al. 2016). But, as chapter 5 made clear, making these investments is far from a casual decision because of fiscal constraints and the many technical and political economy complexities that have left many L/MICs with poorly prepared and weakly supported teachers and leaders and inadequate infrastructure and equipment.

Leaders and teachers

Strong leadership of TVET institutions requires skilled management teams who are empowered through clearly defined roles, sufficient decision-making power, and adequate support. To guide the recruitment, development, and assessment of TVET leaders their responsibilities should be clearly defined (OECD 2021b). They should also have the autonomy to carry out their roles effectively, for example decisions on financing and staffing (Graham and Dean 2018). Teams should have enough initial

and continuing professional development opportunities that are accessible and well-aligned with their needs. Especially for less experienced leaders the opportunities could include, for example, mentoring (OECD 2021b), and peer-learning opportunities (Graham and Dean 2018). TVET managers can be further supported by, for example, ensuring that they have access to relevant labor market information (Graham and Dean 2018). Their performance can also be promoted through incentives like results-based financing, which is discussed in chapter 11.

As in every other part of the education system, the most important input to learning is teachers and trainers (World Bank 2018d; Axmann et al. 2015; Stanley et al. 2014). The evidence, mostly from general education, shows that teachers' classroom practice varies widely, has important impacts on student learning, and cannot be predicted by the observable characteristics commonly used to hire and promote teachers (Bruns et al. 2018; Olelewe et al. 2021). This means that education systems, including TVET, first need better ways of motivating and identifying candidates with the potential for excellence and of weeding out teachers with less potential early in their careers; and, second, effective strategies for improving the instructional practice of current teachers.

In TVET, these challenges take specific forms. In chapter 5, this report discussed limitations caused by incoming teachers and trainers who lack industry knowledge and experience and current teachers who have weak links with industry, inadequate pedagogical skills, especially those related to competency-based education and assessment, and weak digital skills. These challenges will take time to fix: pay and working conditions in TVET are often not competitive with those in industry; there are few female teachers, and there are inadequate opportunities for in-service training (UNESCO 2015c). Teachers of practical courses are also limited in what they can do due to outdated equipment and facilities, making work in the TVET sector less attractive.

This takes us to three key areas for policy action: make teaching attractive, improve personnel policies, and prepare teachers for and support them in TVET. Box 9.1. summarizes the evidence on practices that have shown impact or promise in improving the effectiveness of teachers and trainers in the general education system that can be applied to TVET.

BOX 9.1.
Effective Teachers and Trainers in TVET: Crucial Policy Actions and Relevant Experiences

To build and sustain cadres of effective teachers, a number of elements must be in place. Teaching needs to be considered an attractive occupation, facilitated by strong personnel policies; and teachers should be well prepared and supported both before they enter the profession and throughout their careers, as lessons from general education show. This means that as a profession teaching should offer adequate status, compensation, and career progression; pre-service education should have a strong practical component; teacher selection should be merit-based and have a probationary period; teachers should be continuously supported and motivated through high-quality in-service training and strong institutional leadership; and they must have access to appropriate technology. Evidence-based practices relevant to L/MICs have been identified for each of these principles, including, for example, incorporation of tests of content knowledge and pedagogical competencies in the recruitment process, and provision of structured lesson guides (Table B9.1.1).

Table B9.1.1: Evidence-Based Practices for Effective Teachers

1. Make teaching attractive	• Use communications strategies to heighten occupational prestige. • Peg salaries to competing professions. • Make career progression structures more effective.
2. Improve personnel policies	• Test subject knowledge and pedagogical skills during the hiring process. • Use probation to identify and retain the most effective teachers. • Recognize, promote, and reward effective teachers. • Use a fair and transparent process to allocate teachers to where they are most needed. • Adopt a meritocratic teacher hiring system.
3. Prepare teachers for and support them in TVET	• Ensure that teachers have mastered the necessary content. • Provide teachers with practical pedagogical skills. • Emphasize practical skills in teacher preparation. • Introduce high-quality teacher professional development, tailored to teachers' needs, including practice among teachers and a subject-specific, practical focus. • Provide teachers with structured lesson guides. • Introduce regular teacher coaching, preferably leveraging technology and strong school leadership.

Source: Adapted from Béteille and Evans 2019.

While based mostly on evidence from general education settings, these principles and good practices are equally relevant for TVET. The TVET system, in partnership with employers, needs to provide incoming and current teachers with up-to-date industry-specific knowledge and experience. In Vietnam, for example, since 2014 TVET teachers have had the opportunity to participate in company internships; since 2017, this has been compulsory. Since 2018, in Dong Nai the Machinery and Construction Engineering Company 2 International Technology College and the company Bosch-Rexroth have been cooperating to train vocational teachers in Industry 4.0. In Ethiopia, the National Institute for TVET Teacher Training includes a training center for continuous professional development. Through Memoranda of Understanding with local enterprises, firms can have staff trained in TVET institutions, and TVET institutions can organize firm-based training for their teachers. In Iraq, a model for in-service training included self-directed learning packages to

enable teachers to build their skills to their individual needs. In East Africa, teachers and leaders from regional flagship training institutes were trained on TVET management practices through a partnership with the Guangzhou Technician College in China.

Source: Muhwezi 2022; ADB 2021; African Union Development Agency 2019; Béteille and Evans 2019.

The first line of action is to make TVET teaching attractive through better pay and opportunities for career progression. This is likely to require additional resources—and often reforming civil service laws. This may prove difficult: in most countries in Sub-Saharan Africa teacher salaries already constitute 80–90 percent of TVET costs (Billetoft 2016). Yet if TVET is to attract better teachers, pay and career prospects need to be competitive with those in alternative career occupations. The next steps are to review TVET teacher training qualifications and certification requirements, and to review market-level pay and benefits in alternative jobs, in the public and private sectors. Pay for TVET teachers may require a different pay scale from general education, related to market rates elsewhere and location of work

Several countries have been considering accompanying higher teacher pay (not necessarily in TVET) with more accountability for results. However, so far the track record of these schemes—even at the experimental level—has been quite poor.[40] Probably more feasible would be to accompany more modest increases in pay with more flexibility to combine teaching with industry work, as by making training compatible in terms of hours with work outside. And arguably just as important as pay is better supporting career progression, linking it to teacher performance and in-service training rather than to seniority, which is still the norm in most L/MICs. Similarly, seizing opportunities for secondment in industry can also be considered part of a teacher's portfolio when promotion is considered (UNESCO-UNEVOC 2020).

Recruitment should aim to hire teachers with the appropriate technical skills and significant industry experience, not just a teaching certificate. In the Philippines, for example, requirements for the National TVET Trainers Certificate include a relevant national vocational certificate, training pedagogy certification, and industry experience, even though trainers can be allowed a grace period to obtain industry experience (TESDA 2019). When the combination of vocational expertise and a teaching certificate is not possible, making the experience a priority may arguably be best, then using in-service training to improve pedagogical skills. Recruitment policies would also benefit from supporting more female teachers, particularly in male-dominated specializations in order to provide female students with role models and mentors; pay incentives may also be necessary to attract teachers to work in remote areas. Where teachers are public employees, these reforms may require changes to the civil service law. In El Salvador, for example, a program that implemented significant reforms in secondary and post-secondary TVET hired teachers with sector-relevant experience,

40 For a recent review of the literature, see Breeding et al. 2021. Only a few teacher pay-for-performance (PFP) programs have improved student learning in L/MICs: only 33 percent of evaluated teacher PFP programs were sustained beyond the evaluation period (Chile, Indonesia, Pakistan, Punjab, Uruguay, Zambia), and only one (Chile) showed positive impacts on student achievement. Technical requirements, resources, and political will are necessary, although not sufficient, preconditions for PFP programs to be successful. Technical requirements include having a capable bureaucracy and reliable data systems to help distinguish effective from ineffective teachers. Even with these conditions, there are common implementation challenges, including cheating, teaching to the test, and manipulating tests by excluding poorly performing students.

but enforcement of civil service laws meant that those teachers did not have their contracts renewed and were replaced with traditional civil servants without similar sector experience (Campuzano et al. 2016).

There are also some innovations in schemes that aim to recognize career progression and set standards for teachers. For example, six of ten countries in the Middle East and North Africa have developed occupational standards for technical teachers to recognize career progression, though it is too early to tell whether or how the new standards are influencing student outcomes (OECD 2014a; 2010; UNESCO 2014). Ethiopia, Lao PDR, and other countries have introduced standards and expanded the qualifications for technical training instructors, although whether these programs have been effective is not clear because most are not evaluated for impact (World Bank 2018d).

A third line of action for a teacher strategy in TVET relates to providing effective pre-service and in-service teacher training. Improving pedagogy is critical to the success of education and training programs (Evans and Popova 2016), and in-service teacher training has shown promise as a mechanism for achieving this goal (Angrist and Lavy 2001; Cilliers et al. 2019; Glewwe et al. 2013). In many contexts, teacher training in TVET needs to be ramped up, using evidence-based approaches to improve teaching practices. Evidence in this area specific to TVET is scant, but there are important insights from the international experience on improving teacher training in general education.[41] One exception is a program in Nigeria, where a quasi-experimental evaluation found that more practical, learner-centered approaches improved practical test scores more than teacher-centered methods (the dominant pedagogical method there, and probably in most L/MICs). The experiment dealt with three subjects in seven technical secondary schools and trained teachers in using facilitated peer tutoring and industry-based training (Doherty and Aneyo 2019).[42]

Many of the lessons from teacher support in general secondary education, or in the overall education system, are also likely to apply in TVET, including how technology can be of help. In Brazil, a program supported secondary school teachers in the state of Ceará by providing benchmarked feedback on their classroom practices and expert educational coaching through one-on-one virtual sessions; it increased classroom time spent on instruction by 10 percent, which translated into almost three additional weeks of instruction a year. Teachers also used more question-and-answer–based pedagogy, which increased student engagement, and student test scores improved across the board. Delivering the coaching via Skype kept costs at a very low US$2.40 per student (Bruns et al. 2018).

41 Olelewe et al. 2021. For general education, see, for example, Coach , an initiative that helps identify ways to improve in-service teacher professional development (World Bank 2021a). Shifting from teacher-centered to student-centered pedagogy, for example, is important (Ganimian and Murnane 2016), but while this can be done successfully even at the secondary level (Bruns et al. 2018), it is not easy (Berlinski and Busso 2017).

42 Facilitated peer tutoring refers to the use of strategies in which students learn with and from each other (in maller groups with students who are more knowledgeable tutoring the others, having received prior guidance from the teacher) and the teacher acts as a facilitator. In industry-based training, students, with the help of the teacher, are taken to a company for practical experience on a given topic.

There is also potential in tools that facilitate diffusion of the best teaching practices within and between institutions. Teach, for example, is a free publicly-available classroom observation tool that helps identify teacher professional development needs and good practices (Bruns et al. 2018). While it was developed for primary education, it is now being piloted in secondary schools. Teach generates a better understanding of what goes on in the classroom, critical for teachers, institutional leadership, and policymakers designing teacher support. This type of tool can also form the basis for instructor peer-to-peer learning, a key feature of education systems in high-performing East Asian countries.

Particularly important for teacher training in TVET are systematic collaborations with industry. Partnerships with the private sector can facilitate industry attachments for updating technical skills, through actual experience or mentoring. Countries could explore options for twinning arrangements with private firms to upgrade the skills of TVET teachers. In China, where most TVET teachers have only academic qualifications, work placement periods for TVET instructors are an integral part of their professional development. The National Council requires instructors in vocational institutions to spend either one month a year or two months in two years in the industry, during which time they can update technical skills, strengthen contacts with employers, plan work-based learning activities for TVET students, or train in-company trainers on how to teach students. Promotion is contingent on this practical training (ILO 2021a; World Bank 2018c). Many vocational teachers are also employed part-time in the industry; in Shanghai, about a third of vocational instructors work part-time while teaching (Kuczera and Field 2010).

While working on system-wide reforms, improving the teaching workforce can start by focusing on strategic programs and modest adjustments. Since changing the supply of teachers in TVET would take time, partnerships with local businesses and organizations can help bring industry expertise into the classroom. Such a partnership approach has worked, for example, for the Educate! Entrepreneurship curriculum in several countries in Africa, which we describe in more detail below. The program leverages community members to teach entrepreneurship alongside trained teachers in schools, relying on entrepreneurs and employees from local businesses. Similarly, in South Africa Toyota has partnered with more than a dozen technical schools where, among other support, they facilitate engagement of Toyota employees as teachers after work hours (Arias et al. 2019). Sometimes contract teachers may be part of the solution. In Bangladesh, for example, between 2010 and 2019, more than 1,100 contract teachers were recruited and trained; vacancies in faculty posts of project-supported courses fell from 25 percent at baseline to 3 percent at completion (World Bank 2019a).

Infrastructure and equipment, including digital technologies

Adequate infrastructure and equipment complement investments in teachers. Many facilities need upgrading, but for these investments to pay off, they need to be accompanied by reorganization and strengthening of TVET teacher development. Updating infrastructure and equipment is likely to require additional resources, for maintenance as well as acquisition, which should emphasize increasing private sector inputs when procuring new materials and equipment to ensure they reflect the

state of the art; partnerships with the private sector, domestic and foreign owned, that allow for use of firm equipment after hours, or at least observing use during work times, and to secure equipment donations, particularly when large firms are making new investments; and work-based learning—discussed in more detail below—that can reduce infrastructure and equipment needs in TVET institutions. This is an area where strengthening private participation in provision can help because private providers may have more up-to-date equipment (Hicks et al. 2011).

Moreover, the COVID-19 crisis has highlighted the relevance and potential of investing in digital technologies. Virtual reality (VR) training—the process of learning in a simulated or artificial environment—is a clear example of a technology with the potential to increase flexibility, expand access, reduce costs, and improve skills acquisition. Particularly in situations with limited availability of hands-on training or access to proper content and learning environments, VR can enhance learning. A recent meta-analysis of rigorous evaluations of VR training on learning found that, on average, VR training is significantly more effective than traditional training for building students' technical, practical, and socioemotional skills. Results are particularly promising in fields related to health and safety, engineering, and technical education, suggesting potential for these technologies in TVET (Angel-Urdinola et al. 2021). The promise of VR has not gone unnoticed: a few L/MICs—from Ecuador and India to Zambia—are investing in VR for TVET (World Bank 2021d). An assessment of VR laboratories used to train learners on computer networking configuration and troubleshooting in Zambia, for instance, was motivated by the fact that access to real laboratories is scarce and building them is expensive. The study found that there was a statistically significant effect on performance by the group that received VR training in terms of time needed to perform tasks and no significant difference in accuracy, which suggested that VR was cost-effective (Lampi 2013).

While the use of digital technologies has great potential, successful application in L/MICs hinges on understanding their role and making the complementary investments necessary to ensure their productive use while avoiding exclusion. Box 9.2. discusses opportunities for using EdTech in TVET. The literature on the use of technology in education and experience during the pandemic make evident three preconditions for technology to help improve access, equity, quality, and relevance of TVET:

- Investments in technology need to be accompanied by building the capacity of teachers and students to use it effectively.
- Such investments work best when they are meant to complement rather than replace teachers and real workplace experience.
- Attention needs to be paid from the beginning to problems blocking equal access to the technology to avoid exacerbating inequalities and excluding the most disadvantaged (Hoosen et al. 2021).

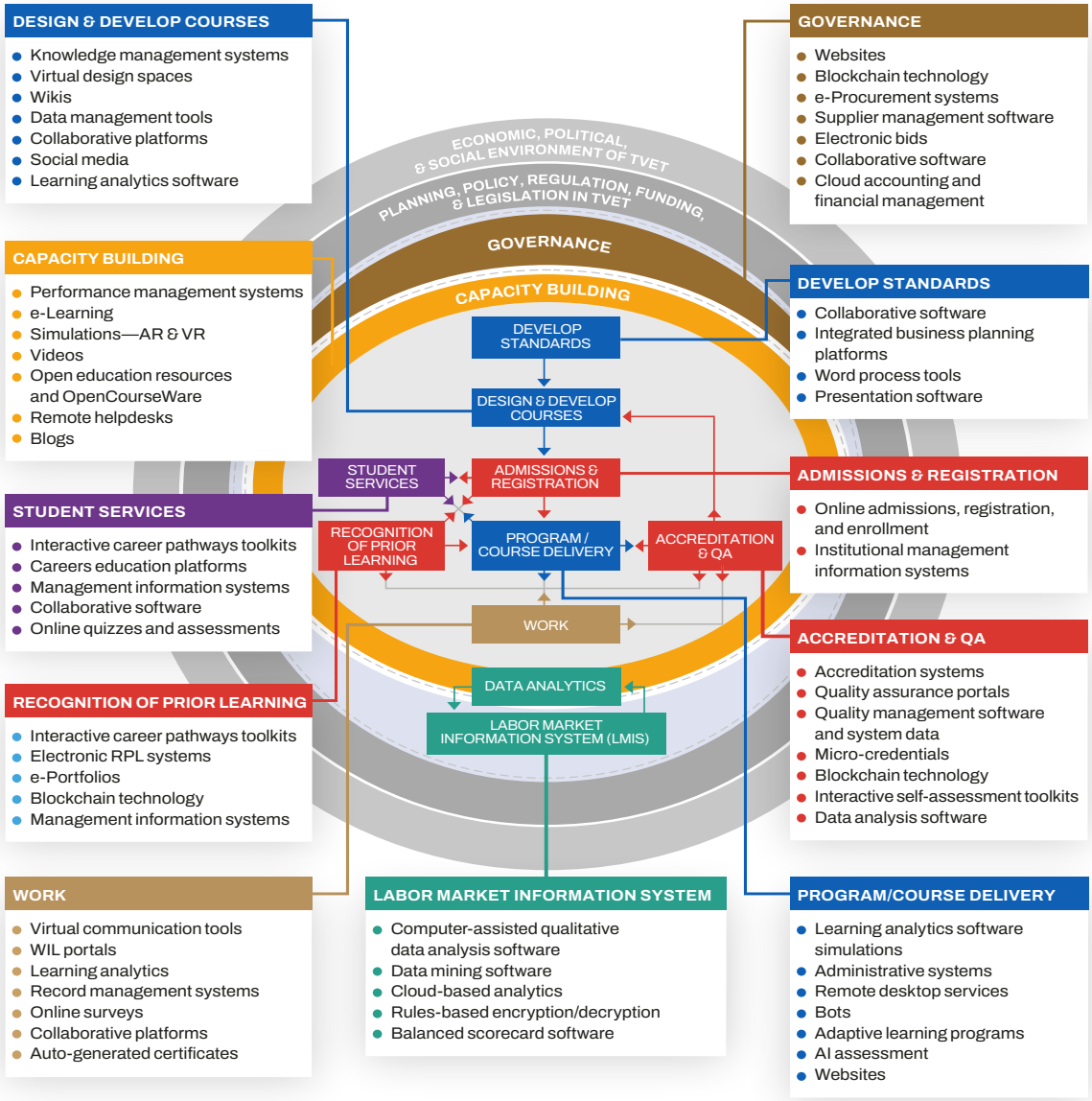
BOX 9.2.
The Many Opportunities for Applying EdTech in TVET

Technology has the potential to enhance TVET performance by improving its access, equity, quality, and relevance but there are also risks, such as widening the digital divide. Technology has been inducing transformative changes in education that were accelerated by COVID- 19. There are innumerable opportunities to use technology to improve TVET. In this report, educational technology (EdTech) is considered to encapsulate the development and use of technological tools, processes, and resources, combined with educational theory and practice that assists in teaching and learning.

Formal TVET systems, especially in L/MICs, have typically been slow to adjust their offerings to technology-induced changes in the world of work or to exploit the potential benefits of EdTech. Efforts to use EdTech have so far focused on a relatively traditional deployment of online and blended learning, which has grown somewhat as part of recent responses to the COVID-19 pandemic. Fewer initiatives focus on high-tech learning approaches, such as those that make use of virtual reality (VR); these are typically small-scale pilots or donor-funded initiatives and not integral parts of TVET systems.

Promising approaches for applying EdTech in TVET include areas like learning materials, online and blended program delivery, work-based learning, and credentialing and recognition of prior learning (RPL) (Figure B9.2.1).

Figure B9.2.1: Potential Uses of Technology in TVET



Source: Hoosen et al. 2021, World Bank 2021d.

The development of technology-enabled materials has grown rapidly in the past decade. For example, content creation tools and platforms are changing how materials are designed and developed, with the potential to transform pedagogical approaches (ILO and UNESCO 2020).

Trends include e-books and e-textbooks that allow learners to download and view titles offline and engage with material interactively. The pandemic spurred a proliferation of digital materials online, such as Open Educational Resources (OER) and Open Courseware, which provide digital teaching and learning materials in the public domain or online and openly licensed. This approach grants free access, use, personalization, and storage in large numbers at relatively low cost (ILO and UNESCO 2020). Online repositories and authoring tools are also low-level, mature technologies, holding significant promise for achieving sustainable educational gains in the short term, as their scalability is facilitated by their low costs (Valamis 2021). Online repositories allow learners to access, store, curate, manage, and reuse digital resources. They can be used for anything from OER, to administrative information or copyrighted materials. An example is YouTube, one of the most extensive educational repositories on the internet, accessed by 1 billion users a month (Latchem 2017). An authoring tool is a user-friendly software program that allows users to create learning content, lessons and courses using text, media, and interactions (Valamis 2021). All these options are not yet widely exploited in TVET. For example, the amount of OER material geared to TVET is small compared to material for K-12 and higher education. This can be attributed to a lack of vision and supporting policies, limited teacher and policymaker awareness and familiarity with OER, and insufficient technological infrastructure or capacity (UNESCO-UNEVOC 2018).

Accelerated by COVID-19, EdTech is increasingly used to deliver online and blended training, building on, digital repositories, collaborative technologies, and formative or summative evaluation tools. Online learning refers to any form of learning that takes place over the internet (World Bank 2021d). In Lebanon the blended "Foreman for Road Maintenance" course, for example, combined online theoretical with practical on-the-job training (ILO 2022). To date, traditional remote learning approaches have tended to be a weak substitute for the experiential learning so central to TVET (ILO et al 2021; Hoftijzer et al. 2020). However, innovations such as virtual or augmented reality (VR/AR), flipped classrooms, and robotics, offer promising approaches. (ILO et al 2021; Hoftijzer et al. 2020). In a flipped classroom, students review required reading or multimedia before the class meets, and then class time is used for discussions, problem-solving, or other kinds of active learning that will help them actualize and assimilate this new knowledge. In some cases, VR training can be more effective than traditional in developing technical, practical, and socioemotional skills (Angel-Urdinola et al. 2021). The rapid proliferation of mobile technology is making personalized virtual learning increasingly accessible. Mobile phones can also be used to record activities, creating options for more remote support from teachers. Social media also offer a range of opportunities for program and course delivery. For example, students can access expert advice, interact with peers and teachers, and apply knowledge in ways that were not feasible a decade ago.

Virtual WBL, during which students interact with in-company mentors and collaborate with their teams through digital channels, could be a promising approach to meet WBL demand (ILO and UNESCO 2020). There can be a fully online approach, or a blended approach that combines remote learning and physical workplace practice. EdTech can also be used to assess skills acquired through WBL. In Malaysia, students can demonstrate proficiency in practical knowledge and skills by uploading evidence of workplace competence (including videos or audio) onto a Massive Open Online Course (MOOC) platform, or they can be assessed in real-time remotely. This also means employers can see most sought-for skills first-hand and do not have to rely on a third party to assure them that an applicant has certain skills (Mazin et al. 2020).

Digital credentials are becoming sufficiently substantive to be included in national qualifications frameworks, with some micro-credentials earning credit if they are aligned with a specific qualification (Harris 2019). In some HICs, such as Canada, micro-credentials can be transferred into a degree or diploma (Jean-Louis 2020). Online learning platforms can be used to support the design, development, and delivery of micro-credentials, in blended or fully online modes. Still, there is little evidence of their use in TVET in L/MICs. Prerequisites for their effective application include digital access, equipment, and skills; pathway visibility; and adequate quality assurance and governance mechanisms (Keevy et al. 2019). In the short to medium term, these may be easier to achieve in specific economic sectors and disciplines than across TVET systems. Because they are online, digital credentials might also expedite Recognition of Prior Learning (RPL) processes. Initiatives to recognize skills acquired

both formally and non-formally include Sri Lanka's National Skills Passport, which provides recognition of skilled workmanship and verified work experience through the central web-based online database (Tripathy 2020; Wang 2020; Zawacki-Richter and Qayyum 2019; Zhou 2019).

To make EdTech work, it is important to accompany investments in equipment with investments in capacity. The capacity and willingness to apply EdTech can be a challenge for everyone within a TVET system, especially since EdTech innovations may require fundamental changes that can be difficult to achieve in low-capacity, low-resource environments. Micro-credentials, for example, involve complicated processes in defining and assuring the quality of providers, verifying learner identities, and addressing challenges related to micro-credential portability and transferability. Capacity constraints of teachers, administrators, and managers can limit their ability to make appropriate decisions for promoting and adopting EdTech. Lack of capacity may be accompanied by reluctance to change, as has been seen in Ghana and Jordan (Abdullah 2021; Shdaifat et al. 2020). In the Philippines, TVET teachers were reportedly uncomfortable with online learning tasks (OECD 2021).

Meaningful reforms to consider:

1. Create an environment that enables effective EdTech use in TVET, based on supportive legislation; sufficient funding; and adequate infrastructure to support teaching, learning, assessment, and administration.
2. Enhance the capacity and incentives of TVET teachers and managers to support systemic changes by providing flexible access to upskilling; changing management and incentives to encourage skills uptake and use; and regularly monitoring the effectiveness of EdTech applications in practice to incorporate findings into teacher training.
3. Encourage partnerships, for example between government, training providers, and EdTech companies, to support and facilitate investment in digital infrastructure; and between government and employers to increase the number of employer-certified micro-credentials.
4. Foster the use of OER and open licensing to promote learner-centric and contextualized materials, for example by investing in digital learning platforms, and promote online educational content with open licenses.
5. Encourage and pilot innovation, with the option of scaling up. Governments can consider, for example, piloting EdTech initiatives to learn and assess what works within a specific country; encouraging institutional management to keep abreast of technological developments; and promoting transparency between the private and public sectors to promote investor confidence and innovation in the sector.

Source: Hoosen, Baijnath, and Butcher 2021; World Bank 2021d.

SECTION 9.2.
Designing Flexible Pathways to Integrate TVET into the Education Ecosystem

A transformation to excellence can be supported by better integrating TVET with the rest of the education system and articulating pathways between education tracks and levels. Problems with early entry into TVET are exacerbated (chapter 5) in systems that do not allow students to move easily between or combine general and technical education. In those cases, technical graduates have few opportunities to re-engage with education or training (Field and Guez 2018).

Partly to make TVET more attractive, especially to students who would not want to close the door to an academic track, countries are starting to allow TVET graduates to continue their studies at more academically-oriented tertiary institutions. The Democratic Republic of Congo has two-, three-, and four-year upper secondary programs offering "bridging" arrangements for TVET graduates to continue to university (Arias et al. 2019). In fact, vocational and academic education can be complementary. In Colombia, for example, a rigorous impact evaluation found that, in the medium and long terms, a technical short-term training program not only made participants more likely to complete general secondary school but also to attend and persist in tertiary general education even eight years after starting training (Kugler et al. 2015).

The creation of effective pathways requires that TVET provides graduates with strong foundational skills and that the broad education system addresses fragmentations in governance. Among ways to do this are national qualification frameworks, credit recognition agreements, recognition of prior learning, career guidance support, bridging programs, or financial support for students transitioning between levels (Field and Guez 2018). While the focus is most often on creating pathways between secondary TVET and general post-secondary education, it is also important (particularly in terms of equity) to pay attention to pathways between short-cycle post-secondary programs and general tertiary education as these are also traditionally weak (UNESCO 2018d). Countries with "community" or "junior" colleges based on the US model, such as Indonesia and Jamaica, are often an exception here (Field and Guez 2018).

While in several countries there are, on paper, pathways between TVET and general education, in practice relatively few students make the transition, even when they wish to do so. This has been partly explained by the fact that secondary TVET graduates often are (or are perceived to be) inadequately prepared for general education (Field and Guez 2018). Candidates without adequate academic preparation are likely to struggle in higher education and to drop out before earning a degree (Salmi and Bassett 2012). Introductory or remedial programs can prepare learners for higher education, although there have been no rigorous impact evaluations of such programs. Monash South Africa University, for example, offers a one-year foundational program to prepare students, including from TVET, to advance to undergraduate studies. The program focuses on social and civic as well as academic skills and includes a mentoring program. Reportedly, more than 80 percent of students transfer to a bachelor's degree (Godonoga and Martin 2020).

The transition to higher levels of academic education can also be facilitated by offering more TVET programs at higher levels—sometimes referred to as the "vocationalization" of tertiary education (UNESCO-UNEVOC 2013). Short-cycle technical tertiary education programs at the ISCED 5 level are an example of this. These programs usually take two to three years and lead to an associate degree, providing access to general tertiary education while keeping the focus on the labor market. A recent review of short-cycle programs in Latin America found that most include remedial education, since many learners enter the programs with substantial deficits in mathematics, reading, and writing. The review also found that while, in

most countries returns to these programs were on average much lower than returns to bachelor's programs, this was not true for individuals who had started but not completed bachelor's programs, which suggests that short-cycle programs can be a promising option for individuals who are unable to pursue or unlikely to complete a bachelor's program (Ferreyra et al. 2021).

Ideally, bridging programs are part of a comprehensive approach to facilitating transitions between secondary, post-secondary non-tertiary, and tertiary education. Additional measures—when TVET is of high enough quality and students have the necessary foundations to succeed in more academic tracks—can include, for example, flexible admissions procedures and guidance, and credit accumulation and transfer (UNESCO 2015b). An example of flexible admission procedures is found in Guinea, where high-performing secondary TVET learners can proceed to technical tertiary education without taking the baccalaureate, the academic secondary examination (Godonoga and Martin 2020). In Indonesia, public polytechnics are reported to have started to assess TVET learners directly based on their achievements at vocational secondary school, in addition to using entrance examinations (OECD and ADB 2015). Transition can also be promoted when academic and technical studies are offered in the same institution, as in China, where higher vocational institutes have been created as independent branches of universities (UNESCO-UNEVOC 2013).

SECTION 9.3.
Making TVET Demand-Driven

While investments in teachers and infrastructure are necessary to improve the quality of TVET, they are not sufficient to make it relevant to labor market needs. Even when significant efforts have been made to increase TVET access, equity, and quality, the efforts may fail to improve labor market outcomes. In El Salvador, the scholarships and reforms to teacher recruitment and training, investments in equipment and infrastructure, and the introduction of new programs seemed effective, pushing up enrollment in secondary and post-secondary TVET and improving learning outcomes, but they had no impact on students' employment or income compared to students in similar TVET centers. Similarly, investments in a new autonomous training facility accompanied by new programs with competency-based education led to improved perceptions of quality among students and other stakeholders but, while students in some career tracks had a 70 percent placement rate, in others, the placement rate was just 50 percent (Campuzano et al. 2016). Arguably, no task for TVET is more urgent than making it more relevant to the labor market.

Achieving relevance calls for TVET systems to become ruthlessly demand-driven. This can be achived by promoting a comprehensive set of skills and broader support that can smooth the initial school-to-work transition but that also helps graduates navigate changes in the labor market over time and make transitions towards higher-productivity jobs, including in the informal sector; putting the (formal and informal) enterprises in the driver's seat of TVET; and strengthening opportunities for and the quality of practical training, work-based learning, and lifelong learning.

Skills relevant to labor market realities

In most contexts, fulfilling TVET's mission of preparing learners for the world of work has led to a narrow focus on technical skills, and mostly those demanded in the formal manufacturing sector. As discussed earlier, this is disconnected with the evidence that workers need a composite of cognitive, technical, and socioemotional skills to succeed in the labor market, particularly over time (e.g., ILO 2021a; World Bank 2018d; UNESCO 2014). It is also disconnected from the actual employment structure in most L/MICs, which is dominated by the informal sector, with a large share of workers self-employed and in micro-enterprises, and in the agriculture or services sectors. Thus, considering both the preponderant types of skills and of jobs, many TVET systems appear to have significant room to improve.

Making TVET more relevant in most L/MICs means serving the needs of the self-employed and micro-enterprises, to which entrepreneurship skills are central. Entrepreneurship skills traditionally include business skills (e.g., accounting, marketing) but increasingly also socioemotional skills related to self-starting, future-oriented, and persistent behavior deemed critical to successfully establishing and running a business (Campos et al. 2017a). Several countries are making efforts to incorporate entrepreneurship-relevant skills in TVET. In Kenya, entrepreneurship education has been a compulsory aspect at all levels of TVET since the 1990s. Similarly, the Syrian Arab Republic has also integrated entrepreneurship into the curricula of vocational secondary schools (Valerio et al. 2014). But incorporating entrepreneurship education in TVET is far from easy. In Bangladesh, for example, entrepreneurship has been mandatory in TVET curricula for more than two decades, but it is short (a single 2-credit course), purely theoretical, and delivered mostly through lectures. Most teachers have no entrepreneurial experience; and enterprises are not involved in teaching, promoting, or developing entrepreneurship programs (Haolader 2015).

To our knowledge, there is no rigorous evidence on impacts of programs focused on entrepreneurship in formal TVET, but there is ample, and growing, evidence of programs focused on entrepreneurship skills outside of the formal education system (Mckenzie 2020). There is also promising evidence for incorporation of entrepreneurship skills in general secondary education.[43] The Educate! program, for example, has been implemented at the secondary school level and often integrated into national education systems (e.g., in Kenya, Rwanda, and Uganda). The program, led by trained instructors often paired with local entrepreneurs, emphasizes experience-based learning through practically designed lessons, building experience in writing business plans and managing businesses through club activities, in addition to learning vocational skills for potential businesses (Educate! 2014). The program also emphasizes fostering socioemotional skills, such as character, communication, and collaboration, through its curriculum. A quasi-experimental evaluation of the Uganda Educate! program found that four years after completing secondary education, Educate! participants earned an average of 95 percent more than their peers in the comparison group, and had significantly higher business ownership and

43 At the university level, the evidence is even more limited. Alaref et al. 2020) found no impacts 4 years after an entrepreneurship education program in universities in Tunisia, despite small short-term impacts on business ownership.

overall employment rates (Salam et al. 2018). The findings were consistent with earlier findings from a randomized evaluation of the same program (Educate! 2014).

Digital skills, also largely transversal, are becoming a basic requirement in many occupations, even beyond ICT-focused fields of study. Digital skills refer to the ability to use digital devices, communications applications, and networks to access and manage information (UNESCO 2018b). As technology affects an ever-growing number of jobs in all types of industries, digital skills have become essential for many workers (International Telecommunication Union 2018). Virtually all occupations, regardless of the digital intensity of the job, require some basic or intermediate digital skills (Cunningham et al. 2022). Digital skills and the technical skills that TVET focuses on are increasingly intertwined.

Enhancing the digital skills of TVET teachers and learners is vital for graduates' employability and access to flexible lifelong learning opportunities. Learners who enter TVET should ideally already possess basic digital skills so that TVET programs can focus on more advanced, work-specific digital skills. Yet, as discussed in chapter 5, there are significant differences between and within L/MICs in how prepared TVET learners are in terms of digital skills and the availability of digital skills training. Fostering digital skills may also require enhancing teachers' own digital skills (Fau and Moreau 2018). In 2017 the Ministry of Education in Serbia began to build up digital skills in TVET through, e.g., tools for self-assessment of digital skills and digital learning practices for both schools and instructors, and an online platform for training teachers. At the same time, the Serbian Moodle Network was established as a collaborative non-profit network of digitally competent teachers to enhance the quality of digital and online learning (ETF 2017).

The private sector also has a role to play here. In South Africa, the Council for Scientific and Industrial Research and the Siemens company have partnered to equip formal TVET learners with digital and technical skills (ITWeb 2021). In Kenya, the government in 2022 partnered with Google to work on an Android Developer Skills masterplan for use in TVET institutions. The goal is for about 10,000 students in 50 institutions to achieve an intermediate level of digital skills (Tanui 2022). The COVID-19 pandemic also provided the impetus to establish or reinforce public-private partnerships to foster digitalization in TVET (ILO et al. 2021). For example, under the umbrella of UNESCO's Global Skills Academy as part of its Global Education Coalition, the Government of Colombia signed an agreement with telecommunications company Telefonica to equip 1,000 youth with employability skills including digital.[44]

In addition to digital skills, there is an expectation that the green transition will also increase demand for "green skills," meaning skills for greener jobs. Given its focus on providing technical skills and its closeness to labor markets, TVET is likely to be critical in this process. But this transition is still in its early stages, and though change is clearly expected, it is not clear how much change and what type it will be in terms of the skills content of occupations: which new occupations will emerge? which will grow faster? which will shrink? which will disappear altogether? There is also uncertainty about how quickly these changes will take place (ILO 2019c). This is particularly true for L/MICs, given that

44 See https://globaleducationcoalition.unesco.org/Members/Details/250, accessed August 15, 2022.

most of the current evidence on green skills comes from advanced economies, where the greening of the economy has been associated with a greater demand for technical, engineering, and scientific skills, including high-level analytical and technical expertise on the design, production, management, and monitoring of technology (Vona et al. 2018). Critically, demand has also grown for more cognitive and socioemotional skills that are transferable across jobs and are becoming more relevant due to other megatrends in the world of work (WEF 2020; ILO 2019c; OECD 2014a).

TVET systems need to adapt to these changes, both to support the green transition and to improve the employment opportunities of TVET graduates (UNESCO-UNEVOC 2021). A new UNESCO Greening Education Partnership with Member States and key education stakeholders is working to deliver by 2030 strong, coordinated, and comprehensive action to prepare every learner to acquire knowledge, skills, values, and attitudes to tackle climate change and to promote sustainable development. Already, in several countries TVET systems are starting to bring green skills more explicitly into TVET, but it is still too early to have evaluations of impacts from these reforms or programs. In India, the Green Skill Development Program aims to develop green-skilled workers with technical knowledge and a commitment to sustainable development (UNESCO-UNEVOC 2021). In Vietnam, the National Institute for Vocational Training has launched a TVET reform program that recognizes the need for TVET to build competencies to apply climate-friendly technologies (UNESCO-UNEVOC 2021). The Green Jobs Act of the Philippines emphasizes acquiring the human capital needed to enable and sustain the transition to a greener economy (UNESCO-UNEVOC 2021). In Brazil, the ILO surveyed TVET courses to better understand how current curricula relate to green jobs (ILO 2018b). For any changes in skills demand, TVET systems will need to be attuned to developments that change the skills demanded that are related to the green transition and adapt their training accordingly.

Given how rapidly skills needs are changing in some areas, strong partnerships with the private sector are particularly important. A partnership with local and international forestry firms in Southern Africa is a good example of how countries can seek to respond to the skills needs of a greening economy. Between 2014 and 2017, small and medium enterprises from the forestry sector partnered with UNIDO to improve regional collaboration on forestry and wood industry education and training. For example, the partnership supported virtual cross-border training for forestry institute staff and students, and mobile training in selected countries. More than 70 percent of the beneficiaries reported a better job situation and over 40 percent said that they were earning more than before the training (UNIDO 2022b).

In addition to learners, putting enterprises in the driver's seat

To effectively increase the relevance of TVET, enterprises need to be given the space to provide, shape, and fund TVET (Hoftijzer and Cunningham 2020; ILO 2020b). In chapter 8 as well as in chapter 11, we discuss how TVET needs to empower learners to vote with their feet to strengthen accountability for results. Beyond learners, enhancing the relevance of TVET also means strengthening the role of provider and partner enterprises—key stakeholders in TVET—via active participation in shaping programs and funding services.

TVET systems and specific programs in L/MICs have forged strong partnerships with enterprises. Apprenticeships in Sri Lanka, the mining sector in Chile, and the Technology Skills sector council in India are examples of successful TVET systematic partnerships between the private sector and governments (Box 9.3.). There are also numerous examples of such partnerships in the process of emerging, holding promise for what is possible. North Macedonia, for example, has been making progress on partnerships with employers: TVET centers, chambers of commerce, and industry associations have signed Memoranda of Understanding on—among other topics—practical training for students, employer participation in school management, and private sector contributions to provision of services and goods to TVET centers (World Bank 2014b). Curriculum reforms mandating practical training, combined with grants to promote school-industry collaboration, have greatly increased the share of secondary TVET learners benefiting from work-based learning, and the number of companies offering work placements (World Bank 2021b). The main challenge with these latter efforts, however, is to make them sustainable if they prove successful.[45]

BOX 9.3.

Strong Partnerships with the Private Sector in TVET: Examples from Around the World

WBL in Sri Lanka. Sri Lanka has a well-established system for WBL, ranging from mandatory periods of industrial training in school-based TVET programs to dual apprenticeships. In 2019, around 17 percent of all TVET entrants were in formal apprenticeships, and a slightly lower share had completed industrial training (Sri Lanka Tertiary and Vocational Education Commission 2019). WBL is coordinated by the National Apprenticeship and Industrial Training Authority, whose board consists exclusively of industry representatives. The system provides for close coordination between stakeholders and different skills provider systems. Employers have been found to be willing and able to engage in WBL, without the need for public subsidies beyond the funding of training authority (Swisscontract 2019).

Identifying and addressing skills gaps in Chilean mining sector. One of the strategic objectives of the Chilean Mining Skills Council, the trade association for large-scale mining companies, is to help overcome mining's human capital gaps. The Council regularly collects data from mining companies and their suppliers on the current labor force and planned large investment projects that could influence future skills demand. For example, it forecasts skill shortages for different occupations, which are used to improve qualification and accreditation frameworks, strengthen the capacity of TVET institutions, and design and provide (re)training programs (CCM 2012; Hoftijzer 2012).

India's technology skills council. The National Association of Software and Service Companies is a trade association; its Sector Skills Council collaborates with the National Skills Development Corporation (NSDC) to ensure that there are enough qualified personnel in the sector. The Skills Council provides training, research, and advocacy, including activities in which it coordinates closely with public administration and training institutions. For example, it helps education institutions to align their curricula with industry-endorsed standards and teacher training; disseminates information on apprenticeships and other publicly supported skilling schemes; and conducts a wide array of analyses of labor and skills demand for the IT sector.[a]

Assessment of practical skills in Lao People's Democratic Republic. In Lao PDR, employers are responsible for the practical evaluation of the apprenticeship certification process. While schools are testing theoretical learning outcomes, employers appraise occupational competency in the presence of teachers who report the results to the school (ILO 2018a).

Training for the automotive industry in Ghana and South Africa. In Ghana, the West Africa Vehicle Academy (WAVA) was recently launched as a joint venture between Rana

45 See, for example, ILO 2020b for a recent overview of experiences in employer engagement in TVET across the world.

Motors, Bosch Automotive Aftermarket Ghana, and German Development Cooperation. WAVA is also partnering with the Ministry of Education to train TVET trainers (WAVA 2022). In South Africa, there is an urgent need to equip youth and women with skills relevant to the post-COVID-19 economy, and to enhance the capacity of TVET colleges. In 2021, a joint initiative by Toyota, the Department of Higher Education and Training, and the Japanese International Cooperation Agency began to train vulnerable women and youth for automotive work. The initiative plans to strengthen the institutional capacity of TVET providers on, e.g., flexible and digital learning and connecting job seekers with jobs by linking trained women and youth, employers, academic institutions, and policymakers (UNDP South Africa 2021).

a: See https://www.sscnasscom.com/, accessed April 13, 2022.

International experience suggests mechanisms for involving the private sector in providing, shaping, and funding TVET. Formalizing partnerships with industry, such as adding industry representatives to advisory boards for TVET institutions; designing programs jointly with enterprises or industry bodies; introducing apprenticeships, traineeships, or internships; and establishing industrial attachments for teachers and trainers are all opportunities for structural collaborations. If they are to bear fruit, however, these efforts require local TVET institutions to have the autonomy to undertake initiatives and form local partnerships with neighboring private companies by, e.g., signing cooperation agreements, accepting funds or in-kind resources, or collaborating for continuous or on-the-job training for teachers.

In terms of TVET provision, efforts may be required to increase the supply of training by the private sector, which is sometimes difficult; where there is already a diverse network of providers, the challenge becomes regulating them to ensure the necessary quality and relevance. In many L/MICs, the public sector is still heavily involved in providing TVET. Yet private providers are often better positioned to respond to labor market needs:

- In Brazil, the courses offered by the publicly financed and privately managed Sistema S, together with manufacturing courses have the most positive impact on graduates' earnings, after controlling for key characteristics of learners with propensity score matching (Almeida et al. 2015).
- In Colombia, vouchers allocated through a lottery that allowed secondary school students to attend private vocational schools led to significant labor market gains for recipients compared to lottery losers, who were likely to attend public technical or academic secondary schools. A likely channel for these impacts is the greater nimbleness of private vocational schools in adapting to labor market needs (Bettinger et al. 2010).
- In Kenya, private schools were significantly more likely to assist students with job placement than their public counterparts. Also, individuals who were awarded an unrestricted voucher to attend either public or private technical schools had higher uptake rates than those whose vouchers were restricted to public institutions. These differences are consistent with the hypothesis that private institutions may provide more flexible and relevant training, allowing their learners to better customize their training programs (Hicks et al. 2013) and with impact evaluations of non-formal training programs (Kluve et al. 2019; Escudero et al. 2019; Hirshleifer et al. 2014).

Rigidities in centralized management, civil service regulations, and slow decision-making can limit the effectiveness of public TVET (Millennium Challenge Corporation 2020). The quality of public provision can also be compromised in situations where regulation and provision of TVET are not clearly separated (Billetoft 2016). This underscores the importance of ensuring fair competition, especially when the public sector is a provider.

Given the clear market failures in areas such as strategy and coordination, management, regulation, and financing of TVET, where the public sector has a comparative advantage, actual provision is—in most cases—probably best left to the private sector (Almeida et al. 2012). In sectors where the private sector alone would underprovide TVET, the public sector can finance students and subsidize providers, especially when, for example, providing training in low-density areas or thin markets, in which case contracts could be bundled with higher-density areas to make them attractive to providers and allow for cross-subsidization, or in fields critical for the economy as a whole but too costly to provide privately (e.g., some STEM fields). Instead of direct provision, in these cases the public sector can competitively hire providers from the private sector using performance-based contracts. As we discuss in the next chapter, this is critical but not straightforward. Where there is already vibrant private sector provision of TVET, the most important role of the public sector is regulation and management that promote quality and relevance while ensuring equitable access. Robust regulation and oversight are a prerequisite to ensure quality and guard against malfeasance and corruption.[46]

In terms of shaping TVET, sector skills councils or similar institutions are increasingly used to engage the private sector more systematically in TVET. Employers often see an advantage in focusing TVET coordination by sector or value chain (ILO 2020b). Skills councils bring together employers and other social partners to present evidence and ideas about skills development policy and practice to governments and training providers (Enabel and British Council 2020). Generally, less-mature skills systems have just a small number of entities that seek to address the skills needs of the main industries in a country. Sometimes the push comes from major regional, national, or transnational employers that have immediate business needs, or development partners (ILO 2020b). From Bangladesh, Brazil, Ghana, Mozambique, Namibia, to the Philippines, South Africa, Sri Lanka, and Uganda sector skills councils are increasingly common. In Bangladesh, for example, Industry Skills Councils bring together industry organizations to act as the main platform for industries to collectively provide advice and technical support to improve the quality and relevance of skills training. ISCs are tasked to analyze industry-specific skills gaps and prepare industry-based action plans (World Bank 2018a).

If sector skills bodies are to be effective, several elements need to be in place: Determination of market demand must be rigorous and evidence based. In Namibia, for example, the recently established industry skills committees have had difficulties using resources from the vocational training grant fund for high-priority skills because they did not have useful guidelines for prioritizing skills (Millennium Challenge Corporation

46 See, for example, in India: https://cag.gov.in/en/audit-report/details/16017.

2020). Stakeholders must trust each other, and trust takes time to develop. Respected and relevant industry representatives must be engaged, and for this, governments must provide adequate space for industry to provide, shape, or fund skills development for their sector. In a recent global survey of employers, when discussing sector skills bodies, many reported limited and flagging engagement, in part because the sector council had minimal influence on critical issues (ILO 2020b). These bodies should be tripartite and include the representatives of government, employers, and workers' organizations. Particularly important for L/MICs, membership must include representation from informal employers, probably through recognized informal sector associations.

In terms of funding TVET, many countries have skills funds or national training funds. We discuss these and other schemes under financing in chapter 11. These usually form a regional or national training fund that provides financing outside normal government budgets for TVET and skills development generally (ILO 2020b; UNESCO 2022a).

Many partnerships to strengthen the role of the private sector in providing, shaping, and funding TVET are supported by formal public-private partnerships. Public-private partnerships can be defined as "a long-term agreement between the government and a private partner where the service delivery objectives of the government are aligned with the profit objectives of the private partner" (OECD 2012). In these partnerships, investments, risks, responsibilities, and rewards are shared between the public and the private sector. In TVET, as in other sectors, they can take many forms. One example from Ethiopia clearly illustrates key principles. The public-private partnership has been established to support and modernize the Selam Technical and Vocational College in Addis Ababa and to establish the Equipment and Commercial Vehicles Academy. The Swedish International Development Cooperation Agency funds training and capacity building, Selam Vocational College provides facilities, UNIDO oversees the project, and Volvo Construction Equipment provides know-how and equipment (UNIDO 2022a).

A number of these partnerships have shown important results. In Morocco, Delegated Management Institutes, which began in the aeronautic and automobile sectors, relied on industry associations to create subsidiary companies to operate and manage independent training centers to serve sector needs. The physical plant and equipment are government-owned and provided to the associations to manage as a concession; an annual performance contract is established between the Ministry of Education and the association laying out centers' performance indicators and providing a government subsidy that covers the tuition for trainees in initial TVET. To supplement the subsidy, centers generate revenue through selling in-service and upskilling training as well as providing consulting services to firms in the industry. While there are no impact evaluations of these institutes, training centers reported placing 90 percent of their 100–200 annual graduates into jobs, compared to just over 50 percent placement rates for regular public TVET institutes (Millennium Challenge Corporation 2020).

Partnerships with the private sector in many countries are used to address particular challenges of skills development in L/MICs. In Egypt, for example, the Ministry of Education and Technical Education is establishing Applied

Technology Schools in partnership with the private sector. Critically for L/MICs, while the main partners are meant to be large companies, alternative modalities allow for a consortium of firms to agree to jointly fulfill the responsibilities of the private sector, making it possible for medium-sized enterprises to participate, and associate partnerships between TVET institutions and neighboring small and microenterprises, in which firms provide work-based learning to students and pay them during the training without the responsibility of managing TVET institutions (UNESCO 2020). UNESCO's Global Skills Academy (GSA) is another type of new partnership: it mobilizes a wide range of EdTech providers such as Coursera, Microsoft, IBM, Huawei, Telefonica, and Siemens. The GSA provides one-stop access to trainings that can help young people build employability skills. The trainings also seek to impart skills that can accelerate the transition to more inclusive, sustainable, and resilient economies.[47]

Despite their potential, public-private partnerships are no silver bullet: they require governments to be well-positioned to capitalize on partnership in the medium and long terms (Billetoft 2016). A common model for public-private partnerships is that a large company, often a multinational, leases a training center, upgrades it to serve its own needs and specifications and brings in its own management and teaching staff. When the contract expires, the center is returned to its owner and the external management and teaching staff are withdrawn.[48] This type of partnership,, although common, risks having only limited sustained impact on the quality and relevance of public provision of TVET. Instead, public-private partnerships should be seen as a pathway to the acquisition of critical technical and managerial know-how and equipment to achieve specific short-term results. This goal can be supported, for example, by increased attention to the capacity of non-employer partners and by establishing broad collaborations rather than engaging one or very few firms in order to diversify business risk and address systemic change more directly.

Work-based and lifelong learning in TVET

The centrality of practical experience in labs, workshops, and actual workplaces is a distinct feature of TVET. Apprenticeships, internships, traineeships, and on-the-job training are the most common types of work-based learning. Because quality WBL is so fundamental to TVET relevance, increasingly, countries are putting it, especially apprenticeships, high on their policy agenda, recognizing its potential for reducing skills mismatches and increasing employability.

Many L/MICs are intensifying apprenticeship systems, although they often stay small. Despite increased attention being paid to work-based learning, building strong formal apprenticeship systems has proven difficult in most L/MICs. Formal apprenticeship models differ considerably by country in terms of regulation, governance, financing mechanisms, recognition, and employer involvement (ILO forthcoming). Since 2016, countries as diverse as Cambodia, China, Colombia, the

47 See https://globaleducationcoalition.unesco.org/global-skills-academy, accessed October 21, 2022.

48 See UNESCO 2020 for a review of experiences in the Middle East and North Africa.

Dominican Republic, India, Senegal, and Türkiye have managed to increase enrollment in apprenticeships (ILO forthcoming). To a significant extent, apprenticeship reforms have been inspired by successful experiences in countries like Austria, Germany, and Switzerland with dual systems that combine on-the-job and theoretical training in one program (ILO 2020b). While these experiences certainly have important lessons for countries at an early stage of development, their adoption has not been particularly successful in many L/MICs (ILO 2020b). Dual systems have very high requirements for success that are difficult for most L/MICs to meet, particularly a large formal sector that collaborates in providing WBL and co-financing for the system and a long history of collaboration and trust among critical stakeholders (Fazio et al. 2016).

However, useful lessons are emerging from efforts to strengthen formal apprenticeships in L/MICs, including adaptations of dual apprenticeship models in high-income countries (Fazio et al. 2016). Arguably the most important lesson is that in quality apprenticeship training systems, there is close collaboration between social partners, enterprises, public authorities, and TVET institutions (ILO 2017a; 2020a), and such systems cannot expand to become recognized pathways from school to work without the strong involvement of employers (ILO 2020b). International experience suggests that creating an enabling environment for quality apprenticeships requires many different pieces that fit well together:

- identifying and implementing strategies, setting national goals, and allocating adequate resources;
- mainstreaming quality apprenticeships in national development strategies and in employment, education, and lifelong learning policies;
- ensuring robust regulation framework;
- encouraging social partners—employer and worker organizations—to support quality apprenticeships by formally involving them in their design and implementation;
- building the capacity of and providing support so that social partners are better placed to participate effectively in regulatory and consultative bodies or within a broad social dialogue;
- providing targeted incentives, financial and non-financial, to enterprises, especially small and medium enterprises;
- encouraging intermediaries, including through financial support, to participate in provision, coordination, and support of quality apprenticeship programs;
- initiating regular awareness-raising and promotional campaigns to improve the image and attractiveness of quality apprenticeships;
- establishing pre-apprenticeship programs to enable young people to acquire the competencies they need to be eligible for such programs;
- facilitating access to further technical and higher education opportunities for apprentices;

- using new technologies and innovative methods to improve effectiveness and efficiency in delivering and managing quality apprenticeships;
- giving sectoral stakeholders the flexibility to recommend training duration, wages, and the proportion of on-the-job training based on the complexity of given occupations and the investment in training required (ILO 2020c).[49]

Critically, for apprenticeships to succeed, firms need to see clear benefits from hiring apprentices, and not only in the short term during the apprenticeship but also as recruitment of potential employees after the program. Many firms tend to see apprentices as a net cost, even in advanced economies with strong apprenticeship systems (Muehlemann and Wolter 2019). The experience of South Africa with the Youth Employment Service program is telling: large firms are willing to pay for apprentices that will then go to work in smaller firms—when they could keep them in house—to claim the incentives of the program in terms of, e.g., increased access to government contracts.[50] But that does not need to be the case: studies in Canada, Germany, Switzerland, and the United States find that many employers often recover initial apprentice costs in the short to medium term (ILO 2019b; Lerman 2013; 2014).[51]

Subsidized dual apprenticeships may address credit constraints for youths and increase firms' willingness to provide general skills training. Côte d'Ivoire's subsidized dual apprenticeship program, for example, not only increased the number of apprenticeship opportunities and apprentices' earnings but also raised the firms' marginal profits, as measured by the difference between the aggregate value of the work provided by apprentices and the compensation they receive from firms (Crépon and Premand 2019). International experience suggests, however, that financial incentives, such as subsidies and tax breaks, are often not enough to interest employers in work-based learning in the long term. Attention should also be paid to non-financial measures that improve the cost-benefit balance of apprenticeships for employers (see Muehlemann and Wolter 2019 for seven lessons on this from advanced economies). These measures include adjusting key parameters of apprenticeship schemes, better preparing at-risk youth for apprenticeships, and providing support (e.g., remedial courses, mentoring) during apprenticeships (Kis 2016).

Expanding apprenticeships in L/MICs will likely require forging new partnerships outside the formal sector to bring the informal sector in as a critical source of practical experience and employment. In most L/MICs, formal apprenticeships are not common (see chapter 5), probably because take-up of apprentices by formal firms is often low and because, in most such countries, the formal sector is still small—even if more formal firms provide work-based learning opportunities, they are still likely to be insufficient given needs. The informal sector can thus be an entry point in many countries to develop work-based learning opportunities, particularly in countries where informal

49 See also Aggarwal and Aggarwal 2021; ILO 2019a; Cumsille 2016; Fazio, Fernández-Coto, and Ripani 2016; Smith and Kemmis 2013. Governments and social partners from 187 ILO member States were planning to discuss new international labor standards for apprenticeships during the 2022 International Labor Conference.

50 See https://yes4youth.co.za/yes-turnkey-solution/.

51 ILO 2019b shows that costs and benefits of apprenticeships vary considerably according to occupation, enterprise, and sector; more research is needed to provide the data that illustrate the financial and non-financial benefits of apprenticeships.

apprenticeships are well established.[52] In Côte d'Ivoire, the subsidized apprenticeship scheme, working mostly with informal firms, increased the share of youths in formal apprenticeships by more than 50 percentage points (Crépon and Premand 2019).

There have been numerous innovations in the delivery of work-based learning in L/MICs. Since traditional formal apprenticeships are unlikely to soon become the norm for skills training in L/MICs, shorter industrial attachments within formal TVET may be more feasible alternatives. Some lessons are emerging for the effective use of internships where they are relatively new. For example, an internship program managed by the Uganda Skills Development Facility found that identifying enterprises willing to place interns is just a first step toward making this an experience that improves learners' skills and employability. Important additional aspects were managing the expectations of interns, ensuring a good match between intern and firm, giving effective guidance by staff from both the firm and the TVET provider, and supporting the transition to jobs after graduation (Skills Development Facility of Uganda 2020). These aspects may be particularly important to emphasize when firms, learners, and training providers have limited experience with internships, and where stakes are high due to a scarcity of capacity, funding, and jobs. In addition, reviewing options for off-site (remote) work-based learning and division of work-based learning between different employers may leverage the opportunities provided by technology and the changing nature of work.

In a world where labor markets and skills demands can be expected to change rapidly, the role of TVET should go beyond initial TVET. Here Brazil can be a useful example. In 2011, it created the National Programme for Access to Technical Education and Employment, the flagship federal technical education and vocational training entity. TVET has since expanded significantly, and short-duration courses represent most of the new training slots— (5 million out of 8.8 million slots created between 2011 and 2014, for example (Silva et al. 2015). Since many workers are trained outside of the formal system, recognition of prior learning is critical.

SECTION 9.4.
Starting Small and Strategic, with Focus on Excellence

Given the magnitude of the challenges in TVET in many L/MICs, it may be best to focus reform efforts first on a few strategic areas in specific sectors with a subset of providers and private sector partners. Improving the quality and relevance of TVET hinges on supporting students to be learning-ready and providing them with flexible learning pathways; recruiting, employing, and supporting industry-experienced teachers in decent working conditions; empowering institution leaders to be innovative and accountable; having adequate equipment and infrastructure in institutions; focusing on foundational and transversal skills, not just technical skills;

52 For a review of experiences in informal apprenticeships and efforts to strengthen them, see ILO's resources on Upgrading Apprenticeship Systems in the Informal Economy (https://www.ilo.org/skills/ projects/ WCMS_158771/lang--en/index.htm).

increasing the involvement of the private sector and providing opportunities for work-based learning; and using data and monitoring to learn, recognize performance, and adjust. This is too large an agenda to tackle all at once at scale.

To make reform efforts more manageable, measure results, and make adjustments before transforming the entire system, many countries are reforming progressively. This is the approach being taken by Bangladesh, Mongolia, and Mozambique, as described in chapter 12. It is particularly important to prioritize sectors where demand-side reforms are underway to align interests and ensure returns on investment. The public-private partnership in Ghana, Morocco, and South Africa in the automotive sector are good examples.

A promising approach is also to create model TVET institutions. In the early 2000s, the Chinese Ministry of Education held competitions and selected 100 tertiary and 1,000 secondary schools as national champions of TVET reform and innovation, providing them with concentrated financial and technical assistance. These model schools were granted policy and financial autonomy to innovate in terms of school governance, links with industries, and incentives for instructors to promote TVET programs. The most promising innovations were scaled up to all TVET providers, both public and private (World Bank 2018c).

Similarly, countries can try to exploit regional synergies. Excellence can also be promoted through flagship institutions in cooperation with other countries to lower the costs of training programs, facilitate the mobility of skilled staff, promote peer learning, and increase the supply of skilled workers for regional economic corridors (Box 9.4.).

BOX 9.4.

Region.al Integration on TVET in East Africa

The East Africa Skills for Transformation and Regional Integration Project (EASTRIP) promotes collaboration between TVET institutions and industry in Kenya, Ethiopia, and Tanzania to support design and delivery of demand-driven training for technical specialists. EASTRIP focuses on the transport, energy, manufacturing, and ICT sectors, where the shortage of specialized personnel was identified as particularly acute.

The goal of the project is to support countries in building enough skills to catalyze national economic development, regional trade, and integration. It also offers opportunities for mitigating climate change—several training programs focus on clean geothermal and hydropower energy and clean rail transport. EASTRIP activities are aligned with the regional integration objectives of the African Union and the East African Community. The approach is expected to lower training costs; facilitate mobility of skilled labor; promote peer learning; and increase the supply of skilled workers for regional economic corridors, such as the Northern and Central Corridor Initiatives and other mega infrastructure projects.

Using a center-of-excellence approach, EASTRIP is supporting a cluster of carefully selected Regional Flagship TVET Institutes. This institute will build excellence from the ground up and create demonstration effects for national TVET systems across East Africa. Centers were selected from a long list provided by participant governments, based on assessment of their detailed 5-year Strategic Investment Plans (SIPs) and site visits. The selected institutions then received technical assistance to elaborate their SIPs, which became the basis for EASTRIP design and performance agreements between the government and the institutions.

The project started in 2019 and, although the COVID-19 pandemic delayed some activities, sustained financial and technical support to the institutions in the last few years has launched a transformation: Achievements to date include training 160 Flagship lecturers, tutors, and TVET managers on management of TVET institutions, and drafting of occupational standards for the rail transport sector by the Ethiopian Railway Academy, in collaboration with the Ethiopian Federal Technical and Vocational Education and Training Agency. The Kenya Coast National Polytechnic admitted 35 foreign students from the region on a full scholarship to a 6-month shipping management course; other flagship centers, such as the KenGen Geothermal Training Centre in Kenya, also report more foreign learners. After memoranda of understanding were signed with industry, 14 instructors from the Dire Dawa Polytechnic College in Ethiopia engaged in industrial attachments by working part time in the private sector to update their practical skills.

Among preliminary lessons already learned are that holistic institution-based reform through SIPs and performance contracts between the government and provider can guide general TVET reform; partnering with provider industry advisory committees has huge potential to enhance the relevance of TVET programs and skills of graduates; building capacity to conduct graduate tracer studies and outreach should be integral to institutional development for all TVET providers, especially public institutions; and it is also crucial to create a positive policy environment through strategic financing and proportional quality assurance so that flagship TVET institutes can flourish.

Source: Based on World Bank 2018b.

Beyond the specific reforms discussed so far, full transformation will depend on the strength of the system's foundations. Embedded in some individual programs, particularly short-term and often nonformal ones, like Generation (Box 9.5.), many of the reform principles discussed in this chapter, but moving to scale requires reinforcing the system's foundations in terms of strategy and vision, governance, and funding and expenditures, and improving stakeholder interactions. We turn to these next.

BOX 9.5.
Generation Program's Task-Based Approach

Generation is an employment program founded by McKinsey & Company that prepares young people for jobs where the necessary middle skills are very scarce or there is high turnover. It covers customer service and sales; technology; healthcare; and skilled trades. The typical participant is between 18 and 29, has basic literacy and numeracy, and is either unemployed or underemployed. Launched in 2014, the program currently operates in 16 countries globally and has graduated over 55,000 learners. The program partners with more than 6,000 employers; 92 percent of those who have hired Generation graduates report that they would do so again. Although there are no randomized experiments to estimate Generation's impact, 84 percent of graduates are employed within 90 days of program completion at wages three to four times higher than before they entered the program.

Generation follows a task-based approach in identifying relevant skills and in training. Central to the program is repeated practice of real situations learners must deal with on the job. The situations have been identified through detailed and context-specific observation of jobs being performed and recognition of the specific tasks on which success on the job hinges (breakdown moments). Generation's approach has seven components:

1. From the start, focus on the jobs available and employer engagement; for instance, Generation confirms job vacancies for placements before learners start training.
2. Students are recruited based on their intrinsic motivation and effort and the employment standards for the profession.
3. Intensive 4–12 week "boot camps" practice the most important tasks of the target profession and cover the technical, behavioral, and mindset skills applied.
6. Employer partners are interviewed for job placements.
7. Mentoring and support services during training follow graduates into the workplace.
8. The program balances the return on investment for both employers and students
9. The prevailing data-driven approach is applied constantly to improve operations and ensure that students are constantly learning and improving.

During the COVID-19 pandemic, Generation adapted its offer to strengthen healthcare systems through programs for both new and current healthcare workers. For example, collaboration with the Mexican Social Security Institute and the Inter-American Development Bank resulted in delivery of demonstration-based online learning modules for about 100,000 non-medical hospital staff on effective personal protective equipment, personal hygiene, and stress management.

Source: See https://www.generationinitiative.org/

CHAPTER 10.

Building More Productive Partnerships Between TVET Stakeholders

A first step in building more productive partnerships in TVET is to institutionalize mechanisms for coordination. In the previous chapter, we discussed sectoral coordination mechanisms for increasing private sector's role in shaping TVET. But, as discussed in chapter 2, a well-functioning TVET system needs to articulate the actions and interests of numerous critical actors, including not only governments, training providers, and enterprises but also employers' and workers' organizations, executing bodies, and research institutions, and at least part of this coordination needs to take place at the national level (UNESCO and ILO 2018a). Yet, TVET strategies in L/MICs are often undermined by a lack of coordination and unclear functions across different actors in the system (ILO 2020b). Even though many countries have created national TVET governing bodies with different degrees of autonomy, there is a tendency to exclude from them such important stakeholders as non-state TVET providers, social partners, and private businesses, especially those that are informal (Arias et al. 2019). Reform efforts should therefore be directed at institutionalizing interactions and establishing effective and inclusive mechanisms for coordination.

Many efforts to improve stakeholder interactions have established high-level national coordinating bodies to formalize leadership roles for coordinating strategy and policy. Their members include not only representatives of different ministries but also often social partners like employers', workers', and civil society organizations. A number of countries from Bangladesh, Burkina Faso, Ghana, India, and Jamaica to Jordan, Malawi, Mauritius, the Philippines, Tanzania and Türkiye—have coordinating bodies for TVET, although their structures and functions vary considerably (ILO and UNESCO 2018). Organizations such as the Technical & Vocational Skills Development Commission in Jordan and the Council for Technical and Vocational Education and Training in Ghana have sought not only to strengthen TVET coordination but also to provide a platform for enhanced private sector involvement in the governance, management, and regulation of skills development (ILO and UNESCO 2018). However, in many L/MICs, legislation and agreements to promote coordination among stakeholders and the multiple ministries and institutions involved in TVET are not fully operational due to delays in getting enabling legislation enacted, unclear mandates, and a reliance on ad hoc mechanisms for coordination (ILO 2020a; World Bank 2014a; 2014b).

Effective stakeholder actions and interactions require not only good communication, but also sustained leadership, clear mandates, and adequate incentives to drive active participation (ILO and UNESCO 2018). Establishing coordinating bodies is only a first step, and overall, more attention must be paid to making coordination continuous and sustainable. In a cross-country survey, many employers highlighted that government commitment to engaging with them often wanes after the creation of coordination mechanisms (ILO 2020b). Some incentives that can be established to promote continued engagement are financial. We earlier referred to a scheme in South Africa under which supporting on-the-job training for disadvantaged youth counts toward firms' scores for obtaining government contracts. Since 2018, almost 2,000 firms and more than 70,000 work experiences have been provided under this scheme.[53] When skills funds exist, providing nongovernmental stakeholders with more ownership over the management of these funds can improve incentives and increase accountability, but incentives can also be nonmonetary.

Incentives to collaborate and participate may be enhanced if an inclusive process is followed not only at the national level, but also at the local level, in individual institutions. In Denmark, for example, each college (private, nonprofit, independent) has a governing board with equal representation of local employers' and workers' organizations that is responsible for college management. Social partners are also represented in many sector-specific local training committees advising the college on the provision of TVET programs and continuing training courses (UNESCO 2020).

Incentives to participate constructively and actively can also be strengthened through strategic demonstration effects of the benefits that stronger partnerships and coordination can bring. By focusing initially on a few key economic sectors with a coalition of willing partners, apex bodies can generate relatively quick wins by establishing effective partnerships between employers, training providers, and representative organizations that would help clarify operational arrangements in other areas and crystalize potential benefits of participating more actively in TVET for the parties involved.

National, sectoral, and local examples demonstrate the importance of effective stakeholder (inter)actions in TVET in L/MICs. In Malaysia, where about 87 percent of TVET graduates obtained employment in 2020 (Ministry of Higher Education 2021), academia-industry cooperation is a key reason for the high marketability of students, because TVET courses are created based on the needs and requirements of private companies. These companies commit to hiring graduates, which in turn ensures employability and livelihoods for these students (SEA-VET.net 2020). In Kenya, a training program combining classroom time and an internship for disadvantaged youth (between 15 and 29 years) increased employment more than a year later by 15 percent for men and increased wage earnings, especially for women and young men aged 25 to 29. Much of the success was due to the private sector association's management of the program, particularly in linking to private sector opportunities for labor market–relevant on-the-job training and in shaping the training curriculum (Honorati 2015). When the

53 See https://yes4youth.co.za/.

program was expanded, but with a smaller role for the private sector association, internship placement became difficult, affecting the performance of the program (Safir 2019).

Strong partnerships can also emerge in response to changing skills needs. The COVID-19 pandemic has demonstrated how partnerships emerge during crises; for example, many countries conducted rapid upskilling of healthcare workers in COVID-19 protocols as well as of other occupations (e.g., teachers in remote learning instruction) by establishing partnerships between TVET institutions, telecommunications operators, technology companies, and government counterparts (ILO et al. 2021). The ILO-UNESCO-World Bank survey of TVET providers during the early weeks of the COVID-19 pandemic identified the instrumental role of partnerships, such as that between IBM and the government of Nigeria, in developing learning platforms and conducting related user training (ILO et al. 2021).

CHAPTER 11.

TVET's Foundations: A Clear Vision with Strengthened Governance and Financing

A TVET system can be only as strong as its foundations in terms of vision and strategic framework, governance, and financing. In this section, we discuss key trade-offs that countries must balance when setting a vision and a strategic framework for their TVET systems, lessons from the international experience regarding governance arrangements to foster autonomy and accountability, and a financing architecture to harness more effectively the private sector's contributions to TVET and better align results and reforms with financing at different levels.

SECTION 11.1.

Vision and Strategic Framework: Weighing Trade-Offs

There is no single way to reform TVET; each country should identify its priorities and sequencing for reforms based on a shared vision that balances critical trade-offs. Different stakeholders are likely to have different priorities for TVET, but prioritizing one goal may make achieving other goals more difficult due to inherent trade-offs or limited financial and other resources. This makes it challenging to develop a shared vision, objectives, and strategies that are realistic and achievable but at the same time maximize TVET's potential to contribute to employment and productivity. Three particularly relevant questions are discussed below.

First, how should TVET systems balance the need to provide youth with skills relevant for today's labor market with the need to prepare workers who are adaptable and can respond to evolving skills needs? We argued in chapter 8 that investments in foundational skills before and during TVET is crucial for both goals. We have also discussed tools and strategies that lessen these trade-offs, including breaking down TVET qualifications into smaller programs and making these more modular and stackable to give learners more flexibility in how they acquire skills. Similarly, investments in information systems and in mechanisms for timelier feedback from the labor market can serve both goals. In other areas, trade-offs are likely to be more salient. At the system level, a balance must be struck between how early or late to start TVET, how much to emphasize transferable skills versus job-specific skills, how to balance theoretical

content with practical skills development, how much to invest in pre-employment versus off-the-job learning, how to prioritize investments in specific sectors and occupations, and how much (and which) technology and equipment to invest in. Significant here are also implications for financing and system design in terms of investing in initial versus continuing TVET. Rapidly transforming economies with robust demand for skills may need to pay more attention to the adaptability and reskilling of their workforce and to making sure that TVET addresses the needs of emerging industries and occupations. Increasing investments in continuing TVET and providing incentives for enterprises to invest in training their workforce are especially necessary in those contexts.

Second, with limited resources and capacities, how can countries balance expectations for TVET to serve the needs of catalyzing and high-productivity sectors with supporting inclusion of low-skilled youth? On the one hand, it is likely that prioritizing aggregate productivity would call for a focused, narrow approach that serves specific high-productivity and growth sectors in partnership with the private sector and aims to attract the best of the best to TVET (in the short term, those who are likely to succeed in TVET without additional investments in remedial training or other support). In countries with dynamic sectors with high demand for skills, efforts should be directed to remove barriers that keep capable and interested learners out of TVET. On the other hand, prioritizing inclusion would call for a larger system that devotesresources to ensuring more youth and disadvantaged groups can access and progress through TVET, with particular attention to foundational skills and to addressing the multiplicity of constraints that the most disadvantaged groups face in TVET and in school-to-work and work-to-work transitions. It is likely that this approach would require greater reliance on public financing and a focus on skills that respond to the needs of a wider set of occupations, sectors, and types of employment (particularly informal self-employment and micro-enterprises). Critically, for inclusion, formal TVET must be much better integrated with non-formal and informal TVET, including for work-based learning opportunities. All TVET systems in high-, middle-, and low-income countries seek to strike a balance between these two priorities in their strategic frameworks.

Third, how much should countries lagging in economic reforms and economic transformation invest in TVET, particularly post-secondary TVET? When private sector labor demand is weak, large or expanding TVET is unlikely to result in better employment and earnings prospects for graduates. When economic and policy conditions are poor, and many young people lack access to economic opportunities, priority must be given to policies that improve the overall environment for job creation and private sector development while providing work-based learning opportunities and rapid, flexible TVET addressing the immediate needs of workers, often in informal, low-productivity wage or self-employment. Selected and strategic investments in partnership with large (including multinational) firms to support the transformation and policy reform process are also likely to be appropriate. In contrast, countries with a dynamic private sector and a policy environment that rewards investment in skills can make more out of investments in post-secondary TVET. Across the board, investing in foundational skills is crucial for additional skills investments, including TVET, to pay off.

An effective vision and strategic framework will also consider how global trends affect TVET today and in the future. As part of the vision and strategy, the capacity of TVET systems to adapt to changing needs and circumstances must be considered. In this report, we have discussed potential implications for TVET arising from megatrends regarding globalization, demographic change (including youth bulges and rapid aging, urbanization, and migration), technological change, and climate change in terms of job creation and destruction, the changing nature of work, and skills demands. The COVID-19 pandemic has also been a stark reminder that resilience of TVET systems must be a central consideration for system reform.

Changes are not only emanating from global megatrends; domestically, the landscape for TVET is also changing rapidly. As discussed in chapter 4, particularly in many low- and lower-middle-income countries, the number of students who will enter secondary education, including TVET, is expected to grow significantly in the coming years. Thinking about how these youth will be further educated can be daunting, especially when there are significant deficiencies in many TVET and basic education systems in L/MICs. At the same time, the challenge of providing good-quality, relevant TVET is also evolving. In some respects, it is becoming more complex, as an already-diverse ecosystem of providers becomes even more heterogenous with the growth of recruitment, learning, and credentialing services and as training needs extend longer over an individual's pre-employment and working life. In other respects, the challenge is becoming simpler to address as advances in technology and a growing body of evidence are expected to improve service provision.

Although a high-level vision and strategy are necessary for TVET systems to succeed, they are simply a start. In chapter 7, we documented that the most significant failings in TVET foundations come from lack of well-resourced implementation plans buttressed by strong governance and resource mobilization frameworks and monitored for progress over time. We turn next to how these failings can be addressed.

SECTION 11.2.
TVET Governance: Quality Assurance, Managing Providers, and Investing in Information and Evaluation Systems

Based on key issues identified in chapter 7, and complementary to discussion of stakeholder interactions in chapter 10, we focus on three interrelated areas at the core of TVET's governance system: TVET's legal, regulatory, and normative framework, particularly related to quality assurance; management of TVET provider networks, with a focus on increasing autonomy and accountability; and TVET's management information and evaluation system. In this discussion, we include emerging lessons on TVET governance reforms that can increase access, equity, quality, and relevance.

Legal, regulatory, and normative framework: Quality assurance

A first step when implementing the vision and strategy for TVET is to update the legal, regulatory, and normative framework that governs the system. Many L/MICs require a thorough review of regulations to update critical provisions. These can include the balance between what must be regulated centrally and in what areas local authorities and individual institutions can be given more autonomy, the progression pathways between TVET and other parts of the education system, and how to establish an appropriate framework conducive to successful public-private partnerships.

Of utmost importance is quality assurance. The large variation in outcomes between TVET programs and between individuals is a risk to students and enterprises and may explain much of the stigma associated with TVET. Effectively regulating TVET providers and holding them accountable is, hence, a necessary condition for a competitive TVET market in which only high-quality, relevant programs are offered—or at least one in which all programs meet a minimum level of quality and relevance.

Significant reform efforts in TVET in L/MICs in recent years have focused on strengthening quality assurance. These efforts have included development of qualification frameworks, standard setting, accreditation of private providers, and new approaches to assessment and certification. An effective and agile system of standards and accreditation ensures that providers deliver learning of acceptable quality. It involves establishing competency standards to guide program design and quality criteria that set minimum benchmarks for institutional or program accreditation, including credible skills testing and certification systems (World Bank 2013). Implementing these elements of a quality assurance system is not without challenges.

Countries use accreditation of training programs and providers to ensure a minimum level of TVET quality. Well-developed accreditation processes usually rely on external assessments that are based on predefined requirements and result in a decision on accreditation. An official body conducts these assessments, often engaging independent experts such as representatives from other TVET institutions in the same field. External assessments increasingly involve stakeholders such as learners, social partners, and civil society organizations. The accreditation focus can differ for new accreditation versus an extension. For example, with a new accreditation, the process might focus on inputs and processes, whereas for extensions, the emphasis could be more on outputs and outcomes. Before the external assessment is initiated, TVET institutions are often required to conduct an internal evaluation. Such self-assessments are an effective tool for quality improvement, especially when applied regularly. Internal assessments should focus on the same criteria and standards as external reviews. Providers might have considerable flexibility in designing their internal quality system, but national guidelines and support in implementing self-evaluations are helpful. Once the external assessment is completed, the accreditation body issues a decision that is usually accompanied by recommendations or necessary changes. Accreditation is usually for a limited period. Transparency and timeliness in the accreditation process are important for increasing trust in TVET quality (ILO 2021b; CEDEFOP 2009).

Accreditation systems, like other quality assurance processes, are complicated to develop, operationalize, and keep updated. Building accreditation systems progressively can support improvements that are consistent with capacity and resources. A gradual approach, starting with the most promising sectors or regions, might be appropriate. In 2018, the government of Egypt announced the creation of the Egyptian TVET Quality Assurance and Accreditation National Authority to introduce quality assurance and accreditation mechanisms for TVET, including work-based learning, according to international benchmarks. The goal is for this body to have accredited most schools and programs under its purview by 2030. Meanwhile, various segments of the TVET system rely on international accreditation mechanisms for quality assurance. For example, the National Academy for Science and Skills, a private vocational training center partnering with industry, offers programs accredited by City and Guilds UK and Siemens (UNESCO 2019). There is also a bottom-up gradual approach to quality assurance—one in which TVET schools and institutes that are vested in quality assurance (and probably receiving capacity-building support) take the lead in developing internal quality standards, in line with international best practice.[54]

The initial focus of accreditation can also be on setting minimum standards and ensuring links to the labor market. Rather than aiming to separate good programs from excellent programs, accreditation processes can start with identifying the weakest programs, to facilitate their closing, and preventing the entry of low-quality ones. At the same time, programs should be screened not only on curriculum and training offer, but also on engagement with the private sector and activities performed to promote graduates' employment. It should also be based on the institution's record with previous programs and expected labor market outcomes. A recent report on short-cycle tertiary programs in Latin America and the Caribbean, including technical programs, shows that if only programs with positive returns were allowed to function, a significant share of existing programs (12 percent in Chile; 53 percent in Colombia) would have to be closed (Ferreyra et al. 2021).

There can also be gains from complementing quality assurance processes such as accreditation with market-based instruments. In particular, practices and instruments that empower learners and enterprises, as key clients of TVET, with the necessary information on labor market performance and key institutional and program parameters would allow them to "vote with their feet." In other words, demand from learners for enrollment in a program or from employers for its graduates—when financing also follows—can be a powerful tool to bring discipline to the TVET market, driving relevant, good-quality programs to become bigger and eventually causing poor ones to close. We return to this when discussing accountability below.

In addition to accreditation, in the last decade, national qualification frameworks (NQFs) have become an increasingly common instrument to improve quality assurance in TVET. NQFs organize qualifications into different levels defined according to a set of learning outcomes, competence statements, or occupational standards associated with each level (CEDEFOP et al. 2019; ILO 2017b). By our estimates, more than 150 countries have NQFs, although some have only recently

54 See ILO 2021b for an application of this approach to the TVET system in Lebanon.

been established (ACQF 2022; UNESCO et al. 2019; Keevy and Chakroun 2015). In principle, NQFs can contribute to lifelong learning and to improving the quality of education and training because they clearly recognize and organize qualifications and learning, increasing stakeholder engagement, and facilitating movement between TVET and general education (ILO 2020b; CEDEFOP et al. 2019).

Realizing the potential benefits of NQFs requires significant resources and technical capacity. NQFs are just frameworks and, by themselves, cannot solve fundamental skills challenges or ensure TVET quality. They may be part of the solution and, in some instances, be a catalyst for change but are not a substitute for fundamental reforms that must be undertaken and upon which the success of an NQF depends. A 2017 study of the effects of NQFs on the labor market in six countries at different income levels and with NQFs at various stages of development showed that NQFs did not greatly affect labor markets in terms of employers' hiring decisions, their awareness of qualification frameworks in recruitment and employment practices, or employment outcomes of graduates of programs with national vocational qualifications (ILO 2017b). An exception was the NQF in France, but this is a unique case given the long-term incremental policy reform process for NQF development, the country's strong educational institutions, the relationship between social partners, and the regulation of labor markets (including inclusion of training levels in collective bargaining agreements). These findings are echoed in a previous study (Allais 2010), and the process of developing and implementing NQFs risks becoming even more complex as demands on and expectations of NQFs grow. This is linked to the search for systems that compare skills and qualifications internationally, emergence of digital credentials, and the development of tools to recognize the skills of migrants and refugees (CEDEFOP et al. 2019).

Given this complexity, it is important to move incrementally in developing NQFs and to avoid over-investing in complex NQFs. Data on the impact of NQFs are limited, but it is widely considered that expectations regarding their impact are often unrealistic, particularly in L/MICs (ILO 2017b; Bateman and Liang 2016; Allais 2010). Qualitative evidence suggests that NQFs can help improve the understanding of and communication regarding education systems and increase the involvement of enterprises (at least in early stages) but not if complexity, bureaucracy, or cost discourages employer engagement (Young and Allais 2013). The risk of overspecification and redundant qualifications. Many NQF models are complex and pose challenges for countries with many unregulated training providers and limited capacity in government and critical partners. In these contexts, the introduction of NQFs can divert resources to management of burdensome new administrative processes that may not directly affect TVET quality. In South Africa and Tanzania, for example, NQFs have been found to overstretch the capacity of the TVET administration system (Billetoft 2016).

The excessive complexity of NQFs for L/MICs is evident in how long it takes countries to develop these frameworks and how difficult it is to keep them up to date, which is critical if they are to be useful. In Indonesia, commitment to a competency-based approach in TVET started in 2003 with several laws and regulations, including a 2016 regulation mandating the completion of competency frameworks, but competency

standards have been developed for only one-third of the 1,700 identified business areas. More than 60 percent of existing competency standards have not been packaged into the NQF, a precondition for their use in new training programs. Moreover, many of those developed are already outdated and not relevant for the current labor market; 30 percent of the standards that exist are more than 5 years old and have not been revisited since they were first completed (Luque et al. 2020).

A more strategic approach requires stakeholders to develop a clear understanding of the problem to be addressed by a new NQF. Having a clear understanding of an NQF's main purpose will help countries determine where to focus efforts and whether a tight or loose framework should be introduced (Debowski et al. 2018; Chakroun 2010). These efforts will better enable countries to strike a balance between the different roles of an NQF and the complexity and cost of implementation. Simpler frameworks can operate at the sectoral level (where certification is most relevant), and the quality assurance system can accredit institutions and specific programs in a more controlled manner.

Despite significant investment in NQFs and associated quality assurance measures in recent years, persistent challenges regarding quality and relevance of TVET make it evident that institutional reforms based on regulatory tools may not be sufficient. Sizable benefits from accreditation of programs and institutions or from NQFs are also unlikely if employers have no faith in the quality of skills acquired or in the quality assurance institutions. Stronger partnerships with industry organizations and enterprises in quality assurance, in the formal and informal sectors, can help manage costs and promote relevance of and adherence to standards in training and assessment. Employers should inform curricula and the administration of competency assessments, engaging industry professionals or suitably qualified assessors.[55] For self-employed individuals, accreditation and standards will do little if they are not an indicator of quality, do not add value, or ensure higher-quality products and services. Other tools in the policymakers' toolkit can help in building a system focused on results. As we discuss next, to advance these efforts, it is critical to improve management of providers and strengthen information and evaluation systems.

Greater autonomy in managing provider networks with more accountability for results

Many TVET systems are devolving management responsibilities to the local level and giving public TVET institutions greater autonomy. In those cases, public providers have a greater say on staffing, resource use and revenue generation, and qualifications and courses offered. To a significant extent, the push for greater institutional autonomy comes from an understanding that providers are best suited to identify and respond to the needs of their local labor markets (ILO and UNESCO 2018).

55 See, for example, India National Skills Development Corporation 2020.

Greater autonomy must be combined with greater accountability for results to align individual institutions' interests and incentives with those of learners and society. An evaluation of the Millennium Challenge Corporation's US$148 million investments in TVET in El Salvador, Mongolia, Morocco, and Namibia between 2008 and 2014 identified accountability relationships, especially between employers and providers, as a fundamental missing link in increasing employment and earnings (despite projects meeting their objectives in terms of inputs and outputs) (Millennium Challenge Corporation 2020). This is consistent with the role of accountability in service delivery in other areas: putting clients at the center of service provision by enabling them to monitor and discipline service providers, amplifying their voices in policymaking, and strengthening incentives for providers to serve them (World Bank 2003).

Increasing accountability would generate feedback loops for monitoring the extent to which private and public TVET provision remains relevant to the needs of learners and employers. If TVET providers are to be responsive to labor market needs, learners and employers should leverage their client power over providers (short-route accountability) or, as citizens, should influence policymakers, and policymakers then influence providers (long-route accountability) (World Bank 2003). Strengthening the latter route requires significant government capacity and time (World Bank 2003). In L/MICs, hence, a greater focus on improving short-route accountability can bring more immediate results and thus would be an important complement to longer-term, long-route accountability reforms (Millennium Challenge Corporation 2020).

Reforms to strengthen short-route accountability in TVET focus on empowering learners and employers. They require addressing market failures associated with imperfect competition in formal TVET provision and information asymmetries (particularly for learners). In addition, reforms must address limits in learners' power that come from the one-off nature of enrolling in TVET (as opposed to repeated interactions that can help align the incentives of enterprises and TVET providers).

Empowering enterprises, as discussed in chapter 9, requires giving them some influence on governance of TVET providers and allowing them to become formal providers themselves. Public-private governance, for example, can help create short-route accountability of publicly funded providers to employers. There are various examples of how countries can achieve this, although none have been rigorously evaluated for impact. Morocco and Senegal have tried to increase the direct client power of employers by making the training provider a subsidiary of an industry association (Millennium Challenge Corporation 2020). In other cases, employers can provide training directly. For example, Australia recognizes firms as Registered Training Organizations that can obtain training funding from the government to provide employees with transferable, recognized national certifications and qualifications (Millennium Challenge Corporation 2020). In L/MICs, such an approach can be emulated with large employers; since these are often few, industry organizations can also be recognized as registered providers and linked to existing certifications and qualification systems. This is the case in Punjab, Pakistan, under the PSDF (Hilton 2018).

Short-route accountability of training providers to learners can also be strengthened by, for example, using vouchers, learning accounts, or scholarships that allow choice between private and public providers. Where enough high-quality providers or programs exist, vouchers and scholarships that move with the learner can strengthen client power. We discussed in chapter 8 some experiences with these schemes in L/MICs such as Brazil and Kenya.

These mechanisms to strengthen the accountability of providers to learners and employers can be greatly enhanced by strengthening the link between financing and results and depend, critically, on well-functioning TVET and labor market information systems. Only if clients know which programs and providers are high quality and produce graduates that do well in the labor market can they make informed choices.

Information and evaluation systems

As discussed in chapter 7, in most L/MICs, labor market and TVET information and evaluation systems can be significantly improved. There is a scarcity of data and evidence in the TVET sector in L/MICs. For example, more than one-third of L/MICs have no mechanism to systematically provide labor market information (e.g., job vacancies, occupations, skills in demand) to job seekers (World Bank n.d.a).

The contrast with basic education, in which there has been a burgeoning body of evidence on effective interventions, is telling. In the United States, the What Works Clearinghouse has compiled this evidence base since 2002; in 2021, the U.K. Foreign, Commonwealth and Development Office (2022) launched the What Works Hub for Global Education to "use global evidence and local data to prioritize reforms" (Institute of Education Sciences n.d.). There is also increasing recognition in basic education that standardization of education data, not only basic data on enrollment and completion, but also on learning outcomes, is essential for identifying reform priorities and designing effective policies. Three major international organizations—UNESCO Institute for Statistics, UNICEF, World Bank—have joined forces in the Learning Data Compact to ensure that all countries have at least one good-quality measure of learning by 2025 (UNESCO, UNICEF, and World Bank 2021). Finally, there are classroom observation tools, such as the Classroom Assessment Scoring System (CLASS) and *Teach*, that measure teaching practices, providing valuable insights into what happens in the classroom, identifying good practices, and providing an evidence base for teacher professional development and coaching programs (University of Virginia n.d.; World Bank n.d.b). There are no such equivalents in the TVET sphere.

Despite several international initiatives, even basic data on enrollment and completion of training are difficult to standardize given the diversity of TVET programs at different levels, which are sometimes governed by different ministries or agencies (ETF et al., 2012). For example, countries are not collecting standardized information on the participation rate in work-based learning, which hinders cross-country analysis of formal apprenticeships.[56] Investing in collection, analysis, and use of data in

56 To overcome this challenge, the ILO has developed a tool to review countries' apprenticeship policies and systems that has been used to conduct a comparative analysis of apprenticeship systems and intake of apprenticeships in 21 countries. See

TVET systems in L/MICs can increase the use of robust evidence and provide relevant examples to policymakers and practitioners of what can work in their context.

The information needs in TVET are, thus, many and diverse. Better and more timely information is needed on the economic and labor market context (particularly on labor market trends and forecasts), key stakeholders (learners, educational pathways, training institutions and programs, enterprises), and the TVET system itself (operational knowledge, financing, performance). Annex 11.1 presents a table with detailed analysis of information needs of different stakeholders.

In this section, we highlight three areas with critical information needs in which recent innovations can be helpful to countries looking to improve their own systems: TVET graduates' performance in terms of labor market outcomes or enrollment in further education or training, labor market trends and skills demands, and performance and practices of TVET institutions. Although the focus is on systematic, sustained generation of information, it is equally (if not more) important to plan and adequately fund efforts to increase the use of this information for decision making by all critical stakeholders (ILO et al. 2017).

First, information about TVET graduates' labor market outcomes across occupations, programs, and institutions can help (prospective) students make better enrollment decisions and align their choices with the demands of the labor market; provide clear signals to employers on the quality of TVET programs for their decisions on recruitment and collaboration with providers; and help policymakers link financing to results. Given the nature of TVET, the final, true metric of excellence is the degree to which the skills that a TVET program produces are relevant. This is assessed according to graduates' employment rates, whether in their field of study or in another one, and earnings. This must be tracked over time at the program level. An ideal information system would keep track of all TVET programs and their basic characteristics, such as duration and cost and would keep track of all students in the system and follow them into the labor market to enable program-level average returns and employment rates to be calculated. This information should be easily accessible to the public. Another important outcome that should be tracked at the program level is the share of students who, upon graduation, enroll in further education or training.

Several countries have established labor market observatories to generate information and communicate it to stakeholders and the broader public. These institutions collect, analyze, and disseminate relevant information to guide the decisions of students, employers, training providers, intermediaries, policymakers, and investors (Rutkowski et al. 2018). Chile, Colombia, and Peru disclose information on TVET graduates' outcomes through platforms at the post-secondary program level in ways that make it easy to compare across programs in TVET and general education.[57] Recently, the government of Kenya developed a national skills gateway as a one-stop online TVET platform, bringing

Aggarwal and Field 2021 and ILO forthcoming.

57 For Chile, see https://www.mifuturo.cl/; for Colombia, http://bi.mineducacion.gov.co:8380/eportal/web/men-observatorio-laboral/vinculacion-laboral-general; and for Peru, https://www.ponteencarrera.pe/pec-portal-web/.

together TVET learning materials, resources, and stakeholders to facilitate linkages and share knowledge on labor market information, training courses and providers, and career guidance and counseling, and to promote online learning opportunities for TVET students even from remote locations.[58] More generally, international experience can provide useful guidance on what information is relevant, how to produce it, and how to use it, including common challenges (World Bank 2019b).

A key input into labor market observatories are tracer studies of graduates' outcomes in the labor market (ETF et al. 2016). Although tracer studies can be conducted using administrative data or surveys, in L/MICs, where self-employment and informality are prevalent, relying on administrative data (e.g., social security databases) to understand graduates' employment outcomes is insufficient. It is necessary to conduct surveys to understand TVET graduates' trajectories and earnings, including capturing outcomes in the informal sector. Reliable contact information should be collected for TVET students before graduation so that they can be contacted at least once shortly after graduation or, even better, followed up systematically at regular intervals. These surveys can be conducted on a census basis, if resources allow, or at least with a randomly selected sample of graduates. For institutions benefiting from public financing, conducting tracer studies for the initial transition to the labor market could even be required. Phone surveys can facilitate data collection.[59] Experience during COVID-19 with phone surveys to monitor the impacts of the pandemic in more than 100 countries worldwide provides useful lessons (World Bank 2022a). As the survey population is usually youth, tracer studies can also use social media or text for quick, short questions.

Second, current and historical information on the nature of jobs and skills content across occupations and industries, as well as quantitative and qualitative forecasts of skills demand, can help keep the TVET system up to date. Identifying skills needs is the first step in being able to meet them, and because labor market needs evolve, sometimes rapidly, this process must be continuous. Hence, governments must take a system-wide approach of information generation, reflection, and feedback to avoid having TVET programs lag too far behind the needs of the labor market. Although not specific to TVET, it is particularly important for TVET providers to understand these trends in order to support the school-to-work transition and respond to the technical skills needs of the economy. Forecasting efforts should focus on short- and medium-term (at most 5 years) rather than long-term projections given the rapid pace of technological change and the difficulty for employers to predict skills and occupational needs even a year ahead.

In advanced economies, sector-wide (formal) employer surveys are common, but given high informality and self-employment, this approach has limited utility in L/MICs. In most cases, surveys of formal employers must be complemented with surveys focused on the informal sector, as well as with more-regular, less-costly mechanisms for obtaining market feedback, including frequent formal and informal (but structured) consultations with the private sector, such as industry associations and sector skills bodies, and partnerships with private sector job search and matching services (e.g.,

58 See https://www.nationalskillsgateway.go.ke/index.html.

59 See, for example, the tracer study of TVET graduates in Bosnia and Herzegovina using phone surveys (GIZ 2018).

IFC 2017). Technology and big data can be helpful here, although mostly for high- and middle-skilled workers in wage employment. In the context of the changing nature of work, many countries have been investing in gathering this labor market intelligence. Box 11.1. details the case of Indonesia, but other countries such as China, Malaysia, and Mexico have also made significant investments in labor market intelligence in recent years. Partnerships with companies that can leverage big data, for example, LinkedIn and Burning Glass Technologies, are becoming increasingly common and can help reveal labor market needs in particular segments of the labor market (WEF 2020).[60]

BOX 11.1.

Indonesia's Investments in a Labor Market Information System (LMIS): Ambitious Reforms in Progress

The Indonesian government is investing in an LMIS to better match skills supply (including that from TVET) to skills needs. To achieve this objective, the country has been developing a more advanced LMIS with five interrelated goals to improve the relevance of the information for different users; the reliability and continuous accessibility of secured data; the efficiency of the system through application of technology for provision of services to users and for monitoring of outcomes to enable better services and policies; a client-centric approach to improve user experience and satisfaction; and comprehensiveness, serving a wide variety of stakeholders, offering various services, and attending to different needs.

The Indonesian government has developed several platforms that together constitute its LMIS, yet each platform serves a specific function and a varying set of users who are still not well interconnected. The Ministry of Manpower, the national statistics institute, the Civil Servant Selection System, and the Ministry of Education and Culture operate the platforms. There are also other government-owned education and training platforms, as well as privately managed platforms such as Ruangguru, JobStreet, LinkedIn, Glassdoor, and Global Salary Calculator.

In 2016, the Ministry of Manpower launched AyoKitaKerja (now modified into SiapKerja), which quickly became Indonesia's top job-matching platform. The government's ambition is now to transform AyoKitaKerja into the centerpiece of an advanced LMIS as part of the broader human capital initiative. In preparation for this plan, the government benchmarked AyoKitaKerja against a world-class LMIS platform, the Korean Work-net. This review identified significant gaps in various areas, such as data collection and validation, accessibility and user experience, tailored service delivery, strategic marketing, interoperability with other systems, human resources, technical infrastructure, data management, information security, and functions other than job matching. Hence, for AyoKitaKerja to become an advanced LMIS platform, the government is planning reforms to broaden the services offered and reach other segments of the labor market. This effort includes adoption of advanced technologies (e.g., artificial intelligence or big data approaches), development of collaborative partnerships, and creation of a smooth flow of information across institutions.

In addition to platform building, the Ministry of Manpower has implemented four other initiatives to strengthen Indonesia's LMIS and to demonstrate the investments needed to ensure the LMIS serves the needs of job seekers and students, including those from TVET: the Critical Occupation List 2018, to inform targeted education and migration policies that address critical skills gaps; the Occupational Employment Outlook 2020, which analyzes data from a survey of formal and informal firms and reports on the structure of employment, the roster of occupations in the firm, and occupational dynamics; Occupational Tasks and Skills 2020, which reports on the tasks and skills needed to perform jobs in high demand; and the Online Vacancy Outlook 2020, which analyzes online vacancy data and produces labor market intelligence for various users. Integrating and institutionalizing these analytical activities can support the development of a more advanced and effective LMIS.

Source: World Bank 2022b; Granata et al. 2021; Sorensen and Mas 2016; ILO 2014.

60 For LinkedIn, see also the Development Data Partnership (https://datapartnership.org/).

In the context of the transition to greener economies, some middle-income countries are beginning to invest in understanding changing skills needs and implications for their education and training systems, particularly TVET. Doing so requires prior identification of the skills that are complementary to green technologies and organizational practices. Most of the leading efforts in this area are in advanced economies.[61] These approaches are beginning to be adapted to L/MIC context, as in China and Indonesia, although in general, such efforts in L/MICs are rare or nascent (ILO 2019c).

Third, information on selected dimensions of institutional performance and practices can help benchmark service providers and identify good practices and areas in need of support. At least a basic education management information system with information being regularly updated and analyzed should be part of these efforts. Most systems lack information about inputs, outputs, and practices of TVET service providers, including data on facilities, equipment, funding, enrollment in and completion of different programs, student-teacher ratios and staffing needs, training delivery practices, and management practices.

It is thus important for countries to develop or adapt tools to allow them to gather comparable data across institutions and programs on key dimensions, including within classrooms. Tools such as the Training Assessment Project (TAP), described in chapter 5 (Annex 5.1), can help assess institutional and managerial practices in a standardized way to enable feedback and peer learning. Similarly, classroom observation tools such as Teach can benchmark existing teaching practices, inform professional development, and facilitate tracking of progress. Some countries, including advanced economies, conduct institutional assessments systematically, which can not only help individual TVET institutions improve the services they deliver and guide reform, but also be a tool for governments to encourage reform efforts. For example, maintaining national registration as a provider can be made conditional on showing improvements in training delivery, as is done in Australia (DET 2008).

Strengthening information systems will also support the development of evaluation structures to foster learning across countries and across institutions within countries. TVET systems, institutions, and programs are rarely systematically evaluated, and in cases in which assessments are conducted (e.g., as part of the accreditation process), these are almost never used to promote learning and create an evidence base for reforms. The potential impact of better evidence in TVET is enormous given the high heterogeneity of impacts across individuals, programs, institutions, and systems documented in chapter 3 of this report.

Standardized progress indicators and regular system reviews can be complemented with customized indicators, qualitative data collection, and strategic use of rigorous impact evaluations. In addition to collecting data on standardized indicators, TVET institutions should be encouraged to track their own key performance and process indicators. When introducing reforms, information on relevant indicators should also be identified and gathered to support implementation and monitoring. Regular system

61 For the United States, see https://www.onetcenter.org/green/skills.html.

reviews[62] that rely not only on hard data, but also on structured qualitative data collection from stakeholders—particularly enterprises and learners—can also be helpful in informing strategic and operational directions. In addition, used strategically, rigorous impact evaluations can help identify what is working and what is not, thereby supporting and sustaining change in TVET. The number of impact evaluations in TVET has been growing, but there are too few, and they cover too few areas. As a result, the evidence base for some fundamental issues—including which type of TVET programs (or even type of education track) works best for whom or how best to encourage providers and ensure quality and relevance—remains uncomfortably slim.

SECTION 11.3.
Funding and Expenditures: Resource Mobilization for Results

Funding and expenditure mechanisms matter not only for financing TVET provision, but also for shaping stakeholders' incentives and behaviors that affect access, equity, quality, and relevance of TVET. As a result, the goal of strengthening funding and expenditure mechanisms is about not only ensuring sufficient resources for the sector, but also maximizing their potential contribution to a more effective, efficient, equitable, and demand-driven TVET system.

To deliver on key performance dimensions, funding for TVET should be stable, predictable, sustainable, and sufficient. Budget allocation and expenditure mechanisms should be designed to achieve priority goals aligned with the system's vision and elaborated in the strategic framework cost-effectively. This includes ensuring that budget allocation is based on appropriate criteria and that the impact of funding arrangements on efficiency, effectiveness, and equity is regularly monitored (World Bank 2013). As discussed in chapter 7, in many cases, funding for TVET is unstable and unpredictable, and given the paucity of data, it is impossible to say whether it is sustainable or sufficient. Many of the reforms discussed in this chapter should help provide the evidence base to better understand where funding mechanisms are falling short.

Data on financing of TVET are notoriously weak (chapter 7), and improving TVET is likely to require not only more funding, but also better use of available resources. There is substantial literature on potential funding sources for TVET in L/MICs (Hanni 2019; Palmer 2017; Ziderman 2016). Service providers can, in principle, diversify their funding sources and increase revenue through consulting services and fee-based continuing education, as the Brazilian National Service for Industrial Training (SENAI) has done. Providers can also receive donations in cash or in kind from employers. However, in an environment of tight fiscal constraints and many competing demands (including within the education sector), this section focuses on how to make better use of existing private sector financing, including through training funds, and on innovative

62 See, for example, UNESCO TVET policy reviews (https://en.unesco.org/themes/skills-work-and-life/resources), accessed May 16, 2022.

financing mechanisms, particularly results-based financing, that can expand access to and improve the use of resources.

Private sector financing

Given limited resources and existing inefficiencies, it is important to return to first principles and refocus public financing for TVET on areas with wide societal benefits and on fostering equity. Just as in other areas of the education system, there is a strong rationale for public financing that supports access to TVET, particularly for the most disadvantaged groups, given their credit constraints and the immature credit systems in many L/MICs. There is also a strong rationale for public subsidies for TVET provision and enrollment in fields that are deemed critical for the economy and where enrollment barriers (e.g., high cost, high risk, stigma) or wider societal benefits (i.e. externalities) exist. This may be the case, for example, for STEM or healthcare fields. There is a similar rationale regarding externalities for provision of foundational and other transferable skills, such as digital and entrepreneurship skills. If financing is left to individual firms or specific sectors, these skills would be underprovided, because the learner can apply them in any occupation and sector. Hence, the more that TVET helps build foundational skills, the stronger the argument is for it to be publicly financed (although not necessarily publicly provided).

At the same time, given the sector- or firm-specific nature of some technical skills fostered through TVET, there is an important rationale for private sector contributions. The private sector plays an important role in financing TVET not only by providing work-based learning, but also by making direct contributions (UNESCO 2022a). Private sector contributions can strengthen accountability by giving the private sector a greater stake in the results and, through this mechanism, improve quality and relevance of training. When public financing is dominant, there are often concerns about centralization and lack of autonomy that can hamper responsiveness to labor market needs, make it difficult to attract high-caliber staff, and make institutions lose focus because of changes in leadership (Hilton 2018).

A first step to make the most of the private sector's contributions to TVET is to improve the use of training levies, the main financing complement to government resources. To increase transparency and effectiveness of training levies, many countries have established national or sectoral skills funds or training funds. These training funds are statutory, quasi-autonomous bodies under the general umbrella of a government ministry and, more directly, of management councils with varying degrees of stakeholder representation. There are training funds, referring to a stock or flow of financing dedicated to enhancing productive work skills, in 67 L/MICs (World Bank n.d.a). Most training funds (at least 57) are financed through a levy on employers, most often payroll levies, (UNESCO 2022a), and regularly complemented with funding from other sources such as governments, donors, and sometimes workers. In some countries, funds are exclusively financed by taxes or donors. Training funds usually aim to support development of the training market, ensuring that training is demand responsive; securing more, earmarked, stable, diversified pooled funding

for training; and increasing the transparency and efficiency of training expenditures. Lessons on the design and implementation of training funds can draw on experience in past decades (Box 11.2.).

BOX 11.2.

Levy-Financed Training Funds: Lessons from International Experience

Skills development and training funds can take various forms and differ in scope, objective, governance, and disbursement mechanisms. The scope of training funds can be national, regional, or sectoral, with sectoral funds being most common. The typical objective of training funds is to create incentives for training of various groups, such as employees in levy-paying firms (80 percent of national training funds), disadvantaged and marginalized groups (two-thirds of funds), unemployed individuals, especially youth (two-thirds of funds), workers in the informal economy (half of funds), and secondary-level TVET (one-quarter of funds). All funds in Latin America and the Caribbean and almost all in Sub-Saharan Africa allow for the financing of training for disadvantaged groups and workers in the informal economy. National training funds tend to be governed by representatives of the government, employers, and workers (tripartite), sometimes complemented with training institutions or civil society (tripartite plus). Sectoral funds are more often governed by employers, regularly complemented with workers (bipartite) or with training providers or civil society actors. In terms of disbursement mechanisms, there are two broad categories of training funds: reimbursing funds that disburse a part of the levy funds to contributing employers as they engage in training, and funds that exist to generate revenue for TVET more broadly to increase the supply of skills to the labor market, and often confer no special access rights on levy-paying firms. Most training funds in L/MICs are mixed, whereas in HICs, they are almost exclusively reimbursing funds. Training funds' resource allocation methods also vary. In some cases, there are direct mechanisms whereby employers, intermediary organizations, or training institutions can apply for grants or cost reimbursement. In other cases, levy funds are used through a TVET agency or the government to fund TVET programs. Key features of two training funds —the PSDF in Pakistan and the Brazil National Service for Industrial Training (SENAI) — are presented below.

Pakistan's PSDF finances private sector training service providers to support development of a competitive market for private sector skills provision. The PSDF is a not-for-profit company set up by the Government of Punjab, with a private sector–led board of directors. PSDF is not itself a skills provider. After starting as a pilot in a few districts in Punjab, it has expanded substantially over time. It supports more than 500 training service providers, who in turn provide training in more than 250 trades. PSDF designs and launches projects targeting specific sectors or locations, based upon in-depth market research on the technical and socioemotional skills needs of the relevant sectors. Training service providers in sectors that PSDF targets can then apply for funding. To ensure transparency and fairness, an independent third party reviews bids before they are scored and submits recommendations to PSDF's Bid Evaluation Committee for final decision. If contracted, training service providers deliver training under a rigorous system of third-party monitoring before receiving results-based payments. On a pilot basis, PSDF also started a third-party placement service to support the transition to employment (Hilton 2018). To increase sustainability, PSDF has introduced cost-sharing by training providers, although in practice, it still mostly relies on donor and public financing. Although the cost-sharing model is less financially attractive to firms than a fully funded PSDF contract, it offers more flexibility because cost-sharing proposals are not restricted to specific sectors or locations and can be put forward at any time (Hilton 2018).[a]

Created in 1942 as part of the Sistema S group of organizations[b] at the initiative of industrial entrepreneurs, Brazil's SENAI is the largest institution of professional and technological education in Latin America. It is a network of not-for-profit secondary-level professional schools that the Brazilian Confederation of Industry establishes and maintains. It has more than 1,000 schools and mobile units serving 28 industrial sectors, in addition to 25 innovation institutes in cutting-edge knowledge areas (UNESCO-UNEVOC 2022). More than 70 percent of people trained through SENAI obtain employment within 1 year of training completion (UNESCO 2022a). SENAI regularly collects output data, conducts perception studies, and tracks graduates in the labor market. The history of SENAI's financing is

particularly interesting. From its inception, it has had stable revenues because it is funded by a 1 percent payroll tax on all industrial companies. In the 1990s, the importance of the levy as a source of income began to decline with implementation of training agreements, under which SENAI implements or supervises employer-funded training instead of providing it directly in the training centers for which the levy paid. It is felt that a more balanced financing mix has helped SENAI increase the quality and relevance of training. A focus on the sale of training services has encouraged offering of tailored, demand-driven, affordable training courses and thus counteracted the levy-based financing model's tendency to standardize training offer. Flexibility could be particularly important in the context of high informality, increasing interdependency between sectors and the emergence of new training modalities such as distance education (Villalobos and Klasen 2016).

Because most training funds report only on outputs, rigorous evidence of training funds' impact on employment outcomes, workers' employability, or firms' productivity is limited. As is the norm with most TVET programs, rigorous impact evaluations and credible trainee tracer and perception studies are not common. Graduate tracer studies, which exist for approximately one-quarter of national training funds and various sector funds, generally find positive results. An impact evaluation in Brazil found that SENAI training improved labor market outcomes especially for young men and for trainees in rural areas. The average earnings premium for individuals aged 15 to 29 trained through SENAI (28 percent) was significantly higher than for those trained in other institutions outside Sistema S (10 percent) (Villalobos and Klasen 2016). Another evaluation in Brazil confirmed that training provided through Sistema S, including SENAI and other training funds, was associated with better employment outcomes (Almeida et al. 2015). Although there are no similar evaluations for Pakistan's PSDF, it has trained more than half a million individuals (more than 40 percent of them women), with a 92 percent exam pass rate in 2017/18 and an 80 percent reengagement rate (repeat business) from private training service providers, suggesting that they see value (Hilton 2018).[a]

The performance of training funds has been assessed in different contexts such as Botswana, Malaysia, Nepal, and South Africa. A quantitative evaluation in Malaysia found a positive effect on enterprise performance (UNESCO 2022a). Studies from Botswana, Brazil, and South Africa indicate that employers have a positive perception of funded training (UNESCO 2022a). There is also rigorous evidence of positive impacts of the Nepal Employment Fund (although it was donor financed as opposed to levy based); 12 months after the start of the training program, the fund increased non-farm employment by 10 percentage points overall and up to 31 percentage points among those who complied with the selection process. There was also a sizeable gain in monthly earnings (Chakravarty et al. 2019). Even in these few evaluations, impacts do not necessarily capture the specific effects of using a skills fund because it is difficult to disentangle impact of financing modality from other critical design features such as use of results-based financing. In most cases—Brazil's evaluation being an exception—impacts of training funds are not assessed against other financing mechanisms.

Beyond the lack of impact data, several challenges might limit performance of training funds in L/MICs. Although most firms contributing to training funds are large and formal, there are often few of these types of firms in L/MICs. Benefits often go beyond these firms, which can create problematic distortions. Moreover, despite employer engagement being important in fund management for demand responsiveness and efficiency, employers are often insufficiently empowered to play this role effectively. This is an important, common weakness that can occur even when employers appear to be well represented on the board, if government representatives have a more powerful voice or the fund has little autonomy. The observed inefficiency and ineffectiveness of training funds stems, in large part, from spending most resources on administration and operating costs. Such costs were found to account for 76 percent of all fund expenditures in Barbados in 2015 and 40 percent in Malawi from 2014 to 2017. In Barbados, Malawi, and Zambia, almost none of the funds are returned to levy-paying firms to train their employees. In many instances, levy funds are diverted for purposes not connected with training at all, often to the national general budget. In Tanzania, only about one-sixth of the Skills Development Levy goes to the Vocational Education and Training Fund to be used for training-related activities; in Burkina Faso, the training fund receives only about 5 percent of the collected levy; and in Fiji, only 10 percent of the levy is allocated to training-related activities. There is limited transparency about levy collection, administration, and disbursement, making it difficult for stakeholders to hold decision makers accountable.

Key lessons learned on the effective operation of training funds include the following:

- The objectives of the fund must be clear and focused to maximize impact. Given that levy contributions come from employers, the purpose of a levy should be to address market failures that cause firms' skills constraints.
- Enterprises must be in the driver's seat, although there is a role for workers' organizations because workers, directly or indirectly, often also contribute to levies.
- The appropriate role of the government is to encourage investment in training that levy-payers might not otherwise see as a priority, such as training disadvantaged groups, workers in the informal economy, and small firms, even in the informal sector through co-financing or full-cost grant payments to training funds and to address coordination failures, especially between training funds for different sectors.
- It is important to avoid conflicts of interest in the fund's governance, for example, by separating responsibility for fund management from mandates to provide or regulate training.
- The credibility and sustainability of funds depend on strong accountability relationships through sound monitoring and transparency, including in aims, procedures, finances, and measurement and dissemination of outcomes.

Source: UNESCO 2022a; ILO 2020d; Johanson 2009.

a. See https://www.psdf.org.pk/.

b. In addition to SENAI, other organizations in Sistema S include Social Service of Commerce, Social Service for Industry, and the National Trade Learning Service.

A challenge with skills development funds is that the private sector often does not really lead them. On paper, most sector training funds have significant autonomy. The Vocational Training Development Fund in Côte d'Ivoire and the Instituto Nacional de Formación Técnico Profesional in the Dominican Republic are considered to have significant autonomy, although this is often not the case in practice (UNESCO 2022a). A recent survey of firms in L/MICs showed that assessment of funding scheme performance and of scheme management by governments was poor to adequate. Employers generally felt that they did not have much influence over disbursement of funds, even when they had representation on a relevant governance body. Not uncommonly, employers had influence over design of skills funding schemes, but few had an ongoing oversight role (ILO 2020b).

Too often, levy-paying employers see little benefit from their contributions. When governments have too much control over training funds, it can hamper fund performance, as when sizeable proportions of employer levies are diverted to the general budget, as happens in some countries, including Barbados, Benin, Burkina Faso, Fiji, Mauritania, Niger, Senegal, Tanzania, and Zambia (UNESCO 2022a). As a result of weak governance and regulatory frameworks, funds are often used for expenditures other than training (ILO 2020d; UNESCO 2022a). In addition, in most L/MICs, training funds are used not only to finance the training of the contributing firms' employees, but often also that of workers in the informal economy or non-contributing small and medium enterprises (UNESCO 2022a). In Sub-Saharan Africa, half of all levy-financed training funds finance the training for informal workers. In Côte d'Ivoire, the Vocational Training Development Fund finances the training of workers in the informal economy through grants to nongovernmental organizations, formal training providers, or informal sector associations that deliver the training. Similar mechanisms are used in Mauritania and Togo. In countries such as Ecuador, El Salvador, and Uruguay, intermediaries are also used to deliver training to informal workers (UNESCO 2022a).

Although investing in training for informal workers and non-contributing small and medium enterprises is critical in L/MICs, this support should rely on financing from general taxation. This is the case not only for efficiency considerations, but also to ensure that sufficient financing is available for training these groups because the tax base for training levies can be small in countries with a large informal sector. In Chile, the Fondo Nacional de Capacitacion receives annual budgetary allocations and is not levy financed. Eliminating or reducing cross-subsidization from private funds, particularly from outside the firm's sector, can allow for lower labor taxes, which can support formal job creation.

Training levies must become a mechanism to deliver good-quality services that benefit learners and firms and avoid becoming a tax on formal employment (UNESCO 2018c; 2022). Wherever the evidence lands on the balance between positive externalities and potential distortions of training levies, involving contributing firms in governance arrangements supporting design, management, and administration would contribute to more effective implementation, helping mitigate the distortions (ILO 2020b). Levy systems operate better when there are disbursement rules that employers endorse (ILO 2020b).

In recent years, some countries have introduced significant changes to training funds to better align contributions with benefits. In Senegal, before 2016, only 5 percent of the levy was allocated to the training fund, but since then, the fund receives 100 percent of levies collected (UNESCO 2022a). In Colombia, the training fund moved from being financed through a levy to being financed from the general budget in recognition of the wide range of services the fund finances. In Bangladesh, the Human Resource Development Fund was designed to allow for contributions from government, enterprises, and donors (ILO 2016). Severeal countries have tried to strengthen governance of funds by, for example, increasing the role of skills councils. If there is cross-subsidization, it is important to make it explicit, as in Madagascar and South Africa (UNESCO 2022a). The model in Madagascar may be useful elsewhere; the training fund has a dedicated equity window for training workers in the informal economy, financed not from the levy on formal firms but via contributions from development partners (UNESCO 2022a). In countries with more fiscal resources, such a window could be financed from general taxation.

Competitive grants, often used in the context of training funds, to request and fund innovative, industry-driven TVET proposals, are becoming increasingly common for supporting innovation and fostering learning. Some of these grant facilities require matching funds, as in Georgia, where each grant required matching funds of at least 10 to 15 percent from the grantee and its partners (Millennium Challenge Corporation 2021). Competitive grants can also encourage innovation and disseminate successful or promising practices within the system. For example, also in Georgia, a smaller competitive grant facility for TVET providers awarded about US$400,000 to 27 TVET providers to strengthen, document, and disseminate existing or recognized good practices in vocational education (Millennium Challenge Corporation 2021). It is important to ensure that recipients of competitive grants have the capacity to use the funds appropriately, as the experience in Bangladesh shows. There, as part of the Skills and Training Enhancement Project described earlier, a scheme similar to that in Georgia was almost cancelled because training institutions lacked the capacity to absorb the awards.

Initiatives in advanced economies can provide inspiration and be adapted to L/MICs. In 2018, for example, the European Union kicked off its Blueprint for Sectoral Cooperation on Skills, a competitive fund to finance sector-specific cross-country partnerships to develop and implement European sector-wide vocational and technical strategies and programs. The focus is on emerging sectors, such as blockchain and cybersecurity, and sectors experiencing significant restructuring, such as automotive. The partnerships include key stakeholders, such as employers; workers' organizations; research, education, and training providers; and public authorities. In awarded projects, the first year is focused on analyzing sector-specific skills mismatches and trends. Building on this intelligence, the projects develop comprehensive sectoral skills strategies and transnational vocational and training solutions (European Commission n.d.). The instruments used in this initiative can be useful to generate training offerings in new areas and where supply may be lacking. As the recent experience in Namibia's National Training Fund shows, a key difficulty when focusing on high-priority demand-driven training is that there may not be a sufficient supply of qualified training providers to deliver this type of training (Millennium Challenge Corporation 2020). Over time, catalytic funds that not only finance training, but also stimulate development of curricula and organization of training in specific areas can help address inherent coordination failures that limit training supply in new areas.

Results-based financing

Given financing needs and revenue diversification goals, efforts to increase access to innovative financing for TVET can be useful. Examples of innovative financing include performance-based contracts, performance-based loans, impact bonds, debt swaps, income-contingent loans, social impact investment, and green bonds (NORRAG 2022). What many of these mechanisms have in common is a focus on results, with the first two being the most common types of results-based financing used in education and TVET.

Improving outcomes in TVET requires linking financing closely to results. As discussed in chapter 7, most of the funding mechanisms used in TVET in L/MICs do not provide adequate incentives to providers or to governments to improve TVET delivery. A shift to results-based financing (RBF) is made to achieve three interrelated objectives: increase focus on intended results; align actors' incentives with these intended results; and support iterative adaptability, which creates more flexibility for providers to adjust services (Instiglio 2018). RBF refers to financing arrangements in which some payments are contingent on the achievement of predefined, verifiable results. The rationale is that, by linking financing directly to achievement of specific outputs or, ideally, outcomes, these become more salient; stakeholders are encouraged to behave in ways that increase TVET effectiveness by holding providers accountable for results; and providers can have greater flexibility to innovate, learn, and adapt their programs to increase impact (Instiglio 2018). Stakeholders'—including providers'—autonomy is necessary for RBF to work. Box 11.3. summarizes the evidence on RBFs in (mostly non-formal) TVET, discusses selected examples, and presents lessons emerging from international practice.

BOX 11.3.

Results-Based Financing in TVET: Examples from Around the World

Although results-based financing (RBF) of initial, formal TVET provision in L/MICs is rare, important lessons can be drawn from the use of RBF in formal and non-formal programs.

In the **PSDF**, compensation to training providers (of formal and non-formal TVET) is tied 20 percent to graduates' income generation and 80 percent to the performance evaluation of training delivery. The latter is itself a weighted average of frequency and reliability of the provider's reporting (10 percent), training attendance rate (10 percent), quality of infrastructure (15 percent), training deliverables (e.g., consumables, training materials, study plans, study hours, quality of training; 30 percent), training completion rate (20 percent), placement of trainees (10 percent), and length of engagement (5 percent) (Hilton 2018).

The **Nepal Employment Fund** fully paid training providers only after employment outcomes had been verified and a minimum income level of graduates had been confirmed. The RBF provided special incentives for achieving training and employment outcomes for women and disadvantaged population groups. Between 2008 and 2016, the fund placed 90,000 beneficiaries in jobs, of whom 53 percent were women and 80 percent were from disadvantaged groups. An impact evaluation found significant positive impacts on employment and earnings 1 year after receiving training (Chakravarty et al. 2019).

The **Skills and Knowledge for Youth program in Ethiopia** used a similar model of performance-based contracts for short vocational training courses in high-demand occupations, complemented by socioemotional and entrepreneurship skills training, with providers paid for skills improvement and employment outcomes (NORRAG 2021).

Rigorous evidence of RBF impact is limited because few programs are evaluated overall, and when they are, they do not isolate the impact of RBF from that of the rest of the program (Clarke et al. 2021). RBF is one element of many that can contribute to project outputs and outcomes, although it seems promising. A recent review of the international practices in TVET (formal and non-formal) of using results-based contracting, which is a subset of RBF that pertains to a formal agreement between a funder and an implementing entity for payment on delivery of pre-agreed results. The study concluded that, with appropriate planning and systems in place, results-based contracting can help achieve intended outcomes, as experiences in Chile, Colombia, Grenada, Liberia, and Nepal show. The report further highlighted that, overall, results-based contracting has been strongly endorsed in the evaluation of projects in which it has been used (World Bank 2020). These conclusions echo those of a review of RBF in general education that identified potential for the approach to be effective, especially when combined with other interventions such as capacity building (e.g., of principals and school committees) or investments in inputs that improve learning outcomes (World Bank 2019c).

There are three main challenges when designing RBFs in TVET.

The first is to make stakeholders, particularly TVET providers, focus on critical outcomes regarding sustained employment and productivity gains. Employment outcomes are not entirely under the control of training providers, given that employment depends greatly on trainees' efforts, which are difficult to observe, and on labor market conditions, which are beyond the control of a training program. Efforts to introduce RBF must establish mechanisms to manage this performance risk, including by rewarding the relevant party for accepting the risk of at least some trainees failing to secure employment (World Bank 2020). This can be done by using payment metrics that balance short-term employment outcomes with metrics focused on improved marketable skills or employability of program participants. Indeed, most RBF programs use a mix of payment metrics, spanning from outputs, such as training received, to outcomes, such as job retention 6 months after graduation (Instiglio 2018). Recognizing that change in

TVET may take time, RBF can reward not only success, but also implementation of critical reforms in institutional practices.

The second challenge is to ensure that RBF rewards a focus on disadvantaged populations rather than penalizing it. Experience with RBF suggests that, without proper attention, service providers can focus on easier-to-serve populations to the exclusion of the most vulnerable. RBF efforts, therefore, must recognize that the cost of achieving certain outcomes differs across learners. Addressing this risk must be a central consideration in designing RBF contracts and incentive systems to encourage enrollment, completion, and productive labor market insertion of learners from disadvantaged backgrounds. Financing can be structured to promote access for poor and marginalized groups and to promote training women in nontraditional fields (Clarke et al. 2021; Instiglio 2018). A combination of eligibility criteria and different pricing for outcomes achieved by different groups are common ways to manage this risk (Clarke et al. 2021; Instiglio 2018).

The third challenge is to establish a results verification process that is credible yet practical. The weight of different indicators used for disbursement must be balanced against the relative costs and benefits of various verification approaches. This can be complex in TVET because attribution for labor market outcomes, as discussed earlier, is challenging. To address this, one can envision verification processes changing over the duration of the financing contract, maybe with more rigorous methods (including impact evaluations) being used in earlier stages to establish credibility and moving to simpler approaches once a better understanding of true impacts has been established (Instiglio 2018).

Although RBF often focuses on payments to training providers, this does not need to be the case. There is arguably significant potential for use of RBF in TVET within public administration. In Rwanda, the government uses joint performance contracts to encourage collaboration between ministries to achieve targets that require joint actions. One such contract, in place since 2015, focuses on implementing the skills-related component of the National Employment Program, which requires timely translation of data on skills needs into updated course offerings. This joint performance contract has supported development, accreditation, and verification of 33 new programs in the energy, transport and logistics, and agro-processing sectors (World Bank 2017b; 2021c).

Most of the experience and lessons outlined above refer to performance-based contracts and performance-based loans; other RBF mechanisms are only emerging in L/MICs. Take the case of impact bonds—an RBF mechanism in which the entity that pays for the achievement of an outcome (e.g., government or international cooperation agency) commits to paying a service provider only for independently verified results. The outcome payer repays the investor (often a foundation or multilateral development agency), often with a return, only if results are achieved and an independent evaluator has verified them. Investors provide up-front working capital to the service provider to be able to deliver their program, shifting the financial risk of not achieving results from the service provider to the investor (Instiglio 2018). As of 2022, 226 impact bonds had been contracted globally, with 22 in L/MICs (Gustafsson-Wright et al. 2022).

Although to our knowledge none of these impact bonds focuses on formal TVET, several focus on non-formal TVET. Empleando Futuro (Hiring Future) in Colombia,

the first social impact bond in a L/MIC, was focused on placing and retaining vulnerable populations in formal jobs through skills training. The program was successful, exceeding one of its promised results (employment) and almost fully meeting the second one (job retention after 3 months) (Instiglio 2019). India just launched its first skill bond, by the National Skill Development Corporation, to support 50,000 youth over 4 years, of whom 60 percent will be women and girls. The youth will receive skills training and access to wage employment in sectors such as retail, apparel, and logistics. The collaborators on the bond have raised US$14.4 million for youth skilling programs (India National Investment Promotion and Facilitation Agency 2021).

In short, there is a clear need, and impetus in some contexts, to harness the potential of RBF not only to increase resources available for TVET, but also to improve the functioning of the system. The promise is one of a virtuous cycle, within which better outcomes can make TVET more attractive to learners and enterprises and a better bet in terms of public and private investment.

ANNEX 11.1.
Information Needs in TVET Systems: Type, Users, and Purpose

	INFORMATION FOR			
	Learners *(prospective, current, and graduated)*	**Enterprises** *(public and private, formal and informal)*	**Training institutions** *(public and private)*	**Government and administration** *(national, subnational)*
Context				
National development objectives and strategies		Identify training priorities	Identify training priorities	Develop TVET vision and strategy
Labor market trends, features, and forecasts				
Trends and forecasts according to occupation and field of study (employment and earnings)	Decide on TVET and field	Identify training priorities and inform job offers	Decide on training offerings (fields and occupations, level, capacity)	Develop TVET vision and strategy
Skills needs: skills required for different occupations and fields	Decide on TVET and field of study	Identify training priorities	Decide on training offerings	Develop TVET vision and strategy
Skill supply: skills of current workforce		Identify training priorities	Decide on training offerings	Develop TVET vision and strategy
Job details: nature of activities, location, work conditions, prospects, etc.	Decide on TVET and field and occupation to study		Inform career guidance services	Develop TVET vision and strategy
Job vacancies	Find job upon graduation	Inform job offers	Inform career guidance services	Develop TVET vision and strategy
Key TVET stakeholders				
Learners				
Enrollment trends and projections			Decide on program capacity	Develop TVET vision and strategy
Learners' characteristics, skills, motivation, constraints		Select learners for work-based learning placement	Attract learners; identify at-risk learners; inform curriculum, student support services, career guidance	Develop TVET vision and strategy; allocate resources
Graduates' skills, motivation, constraints		Recruit graduates	Design career guidance services	Inform quality assurance, support, and labor market services

	INFORMATION FOR			
	Learners *(prospective, current, and graduated)*	**Enterprises** *(public and private, formal and informal)*	**Training institutions** *(public and private)*	**Government and administration** *(national, subnational)*
Enterprises (characteristics, constraints on engaging in TVET; work-based learning and job opportunities)	Find work-based learning placement; find job upon graduation		Facilitate work placements and job opportunities	Design incentives for work-based learning; school-to-work transition measures
TVET System				
System and operational knowledge				
Benefits of TVET, including benefits of enterprise engagement	Decide on TVET and field of study	Create incentives and provide information on how to engage in TVET	Create incentives and provide information on how to work with enterprises	Develop TVET vision and strategy
Knowledge of regulations, budgets, processes and requirements, standards, curricula, qualification frameworks, etc.		Promote compliance and effectiveness	Promote compliance and effectiveness	Guide reform
Stakeholders' TVET-related constraints, international practices.		Promote TVET's objectives	Promote effectiveness and efficiency	Develop TVET vision and strategy
Financing				
Trends in financing at the level of public sector, households and enterprises			Develop budgets (institution level)	Allocate public resources
Allocation and expenditures according to provider, occupation, level, and expenditure category		Consider and monitor co-financing by enterprises	Develop credible budgets	Inform financing decisions and results-based financing
Possible sources, criteria, amounts, procedures, and costs of funding	Optimize funding to finance study (including work-based learning)	Optimize funding for TVET engagement (including work-based learning)	Optimize funding for TVET delivery	
Performance (monitoring inputs, processes, outputs, outcomes; evaluate policies, practices, pilots)	Hold government and TVET institutions accountable	Hold governments and TVET institutions accountable; improve performance	Improve performance; hold government accountable	Inform TVET vision and strategy, reforms, governance, funding mechanisms, stakeholder collaboration

CHAPTER 12.

A Tale of Three Transformations: Igniting and Sustaining Reforms Through Excellence, End Results, and Evidence

SECTION 12.1.
The Case for Reforming TVET Now

Significant TVET reforms are not only possible, they can also make a difference. In part 2, we discussed challenges common to many TVET systems in L/MICs in promoting access, equity, quality, and relevance, and how weaknesses in stakeholder interactions and the systems' foundations underpin those challenges. In this Part, we discussed how countries can transform their TVET systems to draw on their potential. International experience and the growing, though still limited, body of evidence on what works in TVET have drawn attention to promising innovations that can help support TVET objectives. The agenda for reform is daunting but achievable, as global experience suggests and the examples below illustrate.

Mongolia's comprehensive TVET reforms of a decade ago had significant and growing impacts on labor market outcomes. From 2008 to 2013 the government of Mongolia undertook comprehensive reforms to improve the quality and relevance of TVET in 28 institutions. The effort incorporated institutional reforms, introduced system-wide skills standards and competency-based curricula for prioritized trades, retrained teachers, installed labor market information systems and career counseling, and upgraded training equipment and physical infrastructure. A randomized impact evaluation of the reforms among trainees entering the reformed TVET institutes in 2010–12 identified positive impacts on employment and higher earnings for women. These positive impacts, which rose over time, are attributed to the acquisition of better skills in specific trades, more hours worked, and increased employment opportunities in high-paying sectors (Field et al. 2019).

Reforms in Bangladesh have also had notable impacts on course completion and employment. Between 2010 and 2019, the government of Bangladesh supported selected public and private TVET institutions in improving training quality and the employability of trainees through increased financing linked to reform efforts, institutional

support for reforms, hiring and training teachers, strengthening links with the private sector, and providing financial support to disadvantaged and female students. The examination pass rates of students in supported institutions improved continuously. The academic performance of students improved, as did student retention. Completion rates in supported short courses, for example, rose from 50 percent at baseline to 96 percent at completion. Employment of trainees of short courses within six months of course completion jumped from 30 percent to 51 percent. Encouragingly, 82 percent of local employers reported that graduates whom they had hired over the previous 12 months were good workers with the desired skills (World Bank 2019a).

After the comprehensive reform of the TVET system in Mozambique in the mid-2000s, both graduates' labor market outcomes and employers' satisfaction with hired graduates improved. One element of the reforms that prioritized specific trades resulted in the development of industry-approved standards and qualifications with multiple exit points, establishing strong new consultation mechanisms in the process. A tracer study in 2015 found that within six months 57 percent of TVET graduates in institutions implementing the new competency-based training had found a job or created their own job in an area related to their training, compared to 26 percent at the pre-reform baseline in 2007. Moreover, 80 percent of employers in 2015 reported being satisfied with the system and with graduates, compared to only 25 percent in 2007 (Arias et al. 2019).

These experiences in L/MICs echo sustained reform efforts in advanced economies, particularly in East Asia, in the latter half of the 20th century. Many L/MICs look at countries with strong economic track records like Singapore, South Korea, and to some extent Malaysia for lessons on how to improve TVET. Today, systems in these countries display stakeholder interactions and system foundations that are associated with strong TVET performance. In South Korea, for example, policymakers have access to comprehensive and up-to-date information from the Labor Market Information System, such as Work-net, HRD-net, and Employment Insurance Network, to inform policy design (KRIVET 2007). The country in 2010 introduced a high-profile initiative of "Meister" high schools to address critical skills needs in priority sectors and has many good examples of the established collaboration between industry and training providers, such as the partnership between Samsung and the Korea University of Technology and Education (Box 12.1) (World Bank 2013). Similarly, in Malaysia, the Penang Skills Development Center, a tripartite, industry-led skills training and education center, is an example of what many countries aspire to.

Often missed, however, is the TVET reform journey that these East Asian economies embarked on and the fact that the reforms were linked to their general economic and development transformations. It often took current high performers decades of persistent and comprehensive reforms to structurally improve the foundations of their TVET systems (Figure 12.1), usually as part of a reform agenda that also focused on foundational skills through general education (ADB 2022). Singapore is a clear example of the strong role that leadership has consistently played in shaping the skills agenda and allocating substantial investments to expand and improve the performance of TVET over a long period (Brady and Spence 2010).

BOX 12.1.
South Korea's Experiences with TVET Reform

South Korea's efforts to promote human capital development have been closely aligned with the country's industrialization and economic development strategies since their early stages. In the 1960s, the government's determination to build the foundations for industrialization and promote light industry for export-led growth was accompanied by large-scale basic training for low-skilled workers and gradual introduction of government-led vocational training. In the 1970s, as industrialization deepened and exports turned to heavy and chemical industries and then technology-intensive manufacturing, the TVET system matured, introducing, among other innovations, levy-based financing, the National Technical Qualification System, and mandatory work-based learning. In the 1980s and 1990s, as skills constraints began to risk impeding South Korea's booming economy, the TVET system responded by strengthening governance: creating the Korean Training Authority, modernizing the levy system, and responding to shifting skills demand by updating vocational curricula and focusing on higher-level technical skills through investments in higher education in science and technology, ultimately establishing the Korea University of Technology and Education.

In 2010, the Ministry of Education introduced Meister high schools as a new model of vocational high schools to address critical skill needs in priority sectors. These schools train high-performing students to develop expertise in fields such as ICT, aviation, semiconductor manufacturing, and biotechnology. The schools develop their own curriculum according to industry needs by inviting firms to participate in the process. The government has also signed agreements with organizations such as the Korea Institute of Industrial Technology and the Korea Master Society to secure "Meister teachers" who work within local industries. Firms have hired graduates of Meister high schools, provided work-based learning opportunities, and offered financial support to strengthen the learning environment. Table B12.1.1 shows the various types of school-industry cooperation.

Table B12.1.1: Companies and Associations Cooperating with Meister High Schools

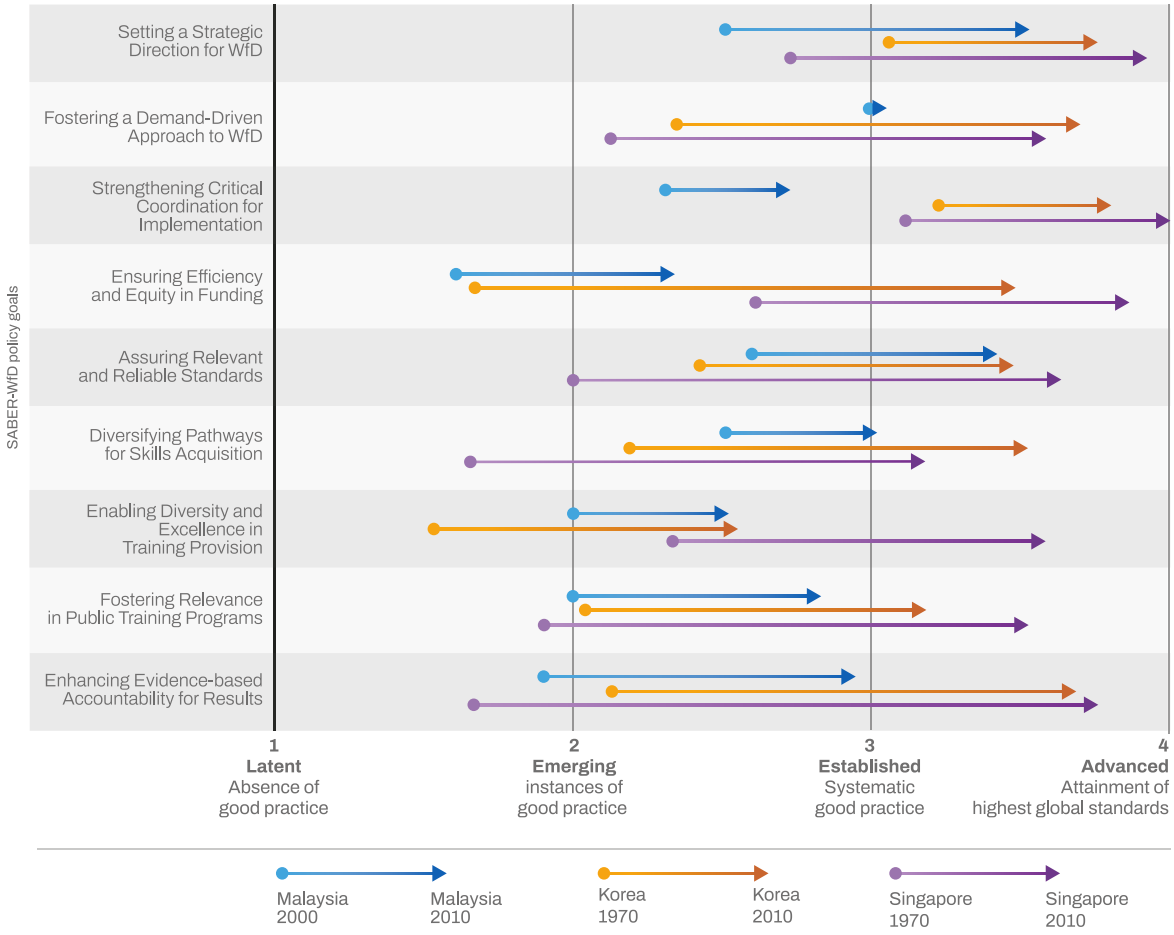
Company or Association	Date of MOU	Cooperation Areas
Samsung Electronics	December 2010	• Hire 100 to 200 Meister high school graduates a year • Support curriculum development and Meister teachers
Hyundai Motor Company	March 2011	• Hire 1,000 graduates of 9 Meister high schools as regular employees over 10 years • Support curriculum development and implement technical mentorship programs
STS Semiconductor & Telecommunications	July 2011	• Hire 40 sophomores from Meister high schools and provide customized training
CJ Korea Express	April 2012	• Hire 30 students majoring in logistics at Meister high schools each year • Provide on-the-job training • Support after-school activities to develop a tailored workforce
Leading companies from Korea Industrial Complex Corporation	October 2015	• Provide scholarships to and give priority to Meister high school students in hiring • Provide field trips and on-the-job training opportunities

Source: Yu et al. 2020.

More recently, South Korea's skills development system has incorporated a commitment to lifelong learning and innovations to prepare the workforce for the Fourth Industrial Revolution. The emphasis on lifelong learning includes efforts to tailor training opportunities to individual needs. This entails a continuing move away from the enterprise-centered system with its unequal access to training, based on each person's employment status and employer, toward TVET that is accessible regardless of labor market position. Workforce preparation for the Fourth Industrial Revolution includes providing workers with the high-level technical skills required for employment in emerging industries and technologies, such as biometrics and big data.

Source: Ryu and Moon 2015; Chae et al. 2021.

Figure 12.1: Evolution of the TVET Systems in Malaysia, Singapore, and South Korea, Has Taken Time



Source: World Bank SABER- WfD data.

Note: See Annex 5.1 for methodological details.

Reform efforts in Malaysia, Singapore, and South Korea naturally vary considerably, tackling different constraints and using different tools and mechanisms to generate change, but there are some common threads (ADB 2022). Usually, approaches to reform are comprehensive; there is a strategic focus on specific sectors and institutions; significant investments in making TVET more demand-driven and linking financing to results (including graduates' labor market outcomes) or reforms; and the spotlight is on teachers, addressing barriers faced by

the most disadvantaged, and strengthening information systems and transitions to the labor market (UNESCO and ILO 2018).

Reforming TVET is urgent, and the moment to embark on ambitious reforms is right given the many opportunities to leapfrog. First, although limited data and evidence is a significant weakness in most TVET systems, there are a number of tools such as graduate tracer studies, skills demand surveys, and provider assessments that can help make TVET more evidence based. Second, there is significant scope to apply global practices and evidence of what works. This evidence base, although still small and insufficient in many areas, is growing. Knowledge sharing at the regional and global levels through dedicated fora and instruments such as the Association of Southeast Asian Nations (ASEAN) TVET Council, the BRICS [Brazil, Russia, India, China, and South Africa] Technical and Vocational Education and Training Cooperation Alliance, and the European Training Foundation (ETF)'s Torino Process try to harness this potential. Third, technology—if the necessary complementary investments accompany it—has the potential to transform TVET in L/MICs from the design and development of courses, program delivery, student services, and recognition of prior learning to governance, labor market information systems, accreditation, and quality assurance (World Bank 2021d; ILO and UNESCO 2020).

the COVID-19 pandemic has created new opportunities for TVET and increased the urgency of reforms. COVID-19 has also accelerated the development of digital learning models in TVET, not only bringing opportunities but also highlighting the many constraints that must be overcome for these innovations to reach their full potential and contribute to the systems' resilience to future disruptions. The pandemic may have also created a (maybe brief) window of opportunity during which stakeholders can use the disruption to build the foundation of an alternative, more effective system. Learning losses during the pandemic have been substantial, and without immediate action, including through TVET, these losses will be amplified over time, with significant impacts on educational attainment, skills accumulation, and labor market outcomes (Azevedo et al. 2021).

In embarking on TVET reforms, countries should consider the significant potential benefits but also be realistic about what TVET (and its reform) can achieve, particularly in the short term. TVET is part of a broader education system, and what it can achieve depends on investment in previous education levels and is limited by existing learning gaps, especially in terms of foundational skills. Moreover, TVET's ability to contribute to the goals of employment and productivity depends on labor demand and the number and quality of job opportunities. The experience of East Asian countries such as Malaysia, Singapore, and South Korea is a good reminder of this. TVET reforms in these countries happened in the context of a broad reform program that expanded job opportunities for graduates of the TVET system, and it took time.

Governments can intervene in TVET systems in multiple areas, but given governments' limitations and capacity constraints, their interventions should be selective and focused. The first focus area for governments should be to lead

the development of a national skills strategy, bringing together all the relevant parts of government and non-government stakeholders. International experience shows that, when governments fail to coordinate across sectors (e.g., education, labor, industry, economy, tax), skills policies have limited impacts as trade-offs are ignored and vulnerable groups excluded (OECD 2019). The second focus area should be on establishing regulatory frameworks and institutional arrangements to make TVET systems more flexible, autonomous, and accountable and to ensure quality and relevance. The government, through, for example, high-level training authorities, should be responsible for organizing and managing oversight of training, including integration of TVET and general education into a single ecosystem with flexible pathways and promotion of lifelong learning among adults. Governments should also play a leading role in quality assurance, in collaboration with social partners. A third area of focus should be financing, focused on public goods (e.g., labor market information systems) and areas with large externalities (e.g., subsidizing provision of TVET in STEM or emerging fields) or equity-enhancing investments (e.g., financing access for disadvantaged learners). The rationale for direct public provision of TVET is weak, particularly when government capacity is limited, given competing demands and comparative advantages vis-à-vis the private sector.

SECTION 12.2.
Three E's of TVET Reform: Excellence, End Results, and Evidence

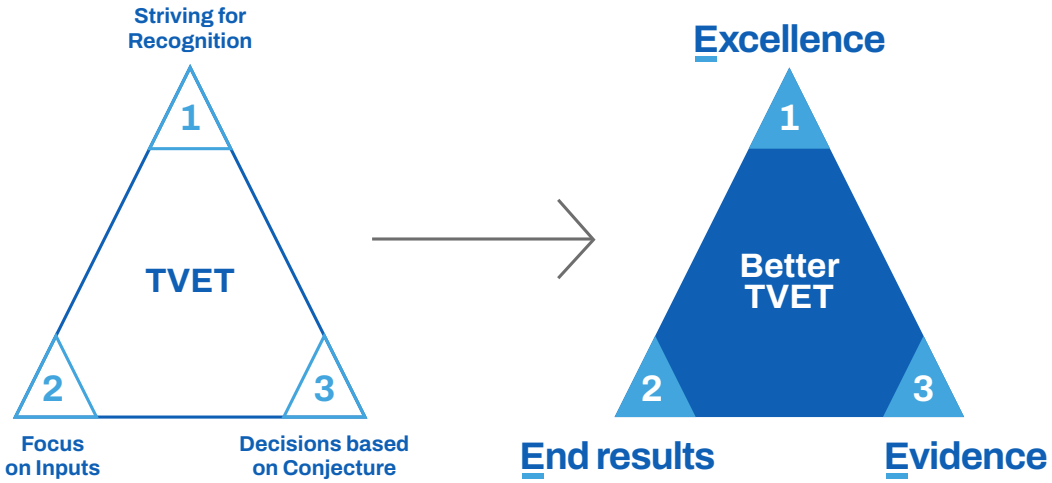
Although desirable TVET reform efforts will differ in substance and sequencing according to context, there are three key transformations for better TVET, or Three E's, that L/MICs can strive for (Figure 12.2). These three interrelated, cross-cutting transformations emerge from the rich set of reform areas and practices discussed in this part of the report and they are aligned with the UN Secretary-General's Transforming Education Summit and respective Thematic Action Tracks, which identify key medium- and long-term transformations needed to advance Sustainable Development Goal 4 on Quality Education.[63]

1. **From striving for recognition to striving for *Excellence*.** This transformation is about moving away from TVET being perceived (rightly or wrongly) as a second-best education track with limited opportunities to continue learning to one that guarantees demand-driven, equitable acquisition of relevant skills with hands-on, flexible instruction using high-quality inputs and provides pathways to further education and training.

63 In particular, the final discussion paper for Thematic Action Track 2 on *Learning and skills for life, work, and sustainable development* provides key recommendations and action points pertaining to foundational, green, and digital TVET and skills development (UNESCO 2022b).

2. **From a focus on inputs to a focus on *End results*.** This transformation emanates from strengthening TVET's governance and financing to increase the autonomy of TVET providers, together with greater accountability for results, supported by more-effective interactions between stakeholders in the TVET ecosystem.
3. **From decisions based on conjecture to decisions based on *Evidence*.** The TVET system is largely operating in the dark—with little data or evidence, even compared with other parts of the education system. Building a robust evidence base of effective interventions and reforms, particularly in L/MIC contexts, and strengthening systems for collecting, analyzing, and using data is essential for achieving better TVET.

Figure 12.2: Three Transformations to Achieve Better TVET: The Three "E"s



These three transformations are about creating mechanisms through which reforms can be initiated and sustained to deliver on TVET's promise to contribute to employment and productivity. As in other policy areas, the main impediment to reform in TVET is often not lack of technical knowledge but addressing the political economy of reform. As we have outlined in part 3, despite TVET's mixed track record in L/MICs, promising models and practices exist, even if achieving sustained progress in TVET at the system level is likely to take time, as it has in countries deemed to have strong TVET systems today. The path to sustained change also must prevent or manage policy reversals. The experience of Mongolia, with which we opened this chapter, provides a cautionary tale. Among other ambitious reforms, national reforms brought private sector representatives into a high-level decision-making body for TVET, yet after a 2012 political transition, this body was effectively dissolved, and several reforms were partially reversed (Millennium Challenge Corporation 2020).

Initiating and sustaining reforms requires reshaping the policy arena by changing who can participate in decision-making processes, transforming incentives to pursue goals, and influencing preferences and beliefs of stakeholders (World Bank 2017c). Striving for excellence in TVET in a gradual manner; focusing on end results; and more deliberately using data and evidence at the program, institutional, and system levels can reshape the TVET policy arena in L/MICs. With that change, TVET can come closer to meeting its promise to contribute to employment and productivity and can do so more equitably and sustainably.

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APPENDIX A:
Country Classification

Table A.1: World Bank Classification of Countries According to Income and Region

Country	Code	Region
Low-income countries (2021 GNI per capita US$1,085 or less)*		
Afghanistan	AFG	South Asia
Burkina Faso	BFA	Sub-Saharan Africa
Burundi	BDI	Sub-Saharan Africa
Central African Republic	CAF	Sub-Saharan Africa
Chad	TCD	Sub-Saharan Africa
Congo, Democratic Republic of the	COD	Sub-Saharan Africa
Eritrea	ERI	Sub-Saharan Africa
Ethiopia	ETH	Sub-Saharan Africa
Gambia, The	GMB	Sub-Saharan Africa
Guinea	GIN	Sub-Saharan Africa
Guinea-Bissau	GNB	Sub-Saharan Africa
Korea, Democratic People's Republic of	PRK	East Asia and Pacific
Liberia	LBR	Sub-Saharan Africa
Madagascar	MDG	Sub-Saharan Africa
Malawi	MWI	Sub-Saharan Africa
Mali	MLI	Sub-Saharan Africa
Mozambique	MOZ	Sub-Saharan Africa
Niger	NER	Sub-Saharan Africa
Rwanda	RWA	Sub-Saharan Africa
Sierra Leone	SLE	Sub-Saharan Africa
Somalia	SOM	Sub-Saharan Africa
South Sudan	SSD	Sub-Saharan Africa
Sudan	SDN	Sub-Saharan Africa
Syrian Arab Republic	SYR	Middle East and North Africa
Togo	TGO	Sub-Saharan Africa
Uganda	UGA	Sub-Saharan Africa
Yemen, Republic of	YEM	Middle East and North Africa
Zambia	ZMB	Sub-Saharan Africa

Country	Code	Region
Lower middle-income economies (2021 GNI per capita US$1,086 to US$4,255)*		
Algeria	DZA	Middle East and North Africa
Angola	AGO	Sub-Saharan Africa
Bangladesh	BGD	South Asia
Benin	BEN	Sub-Saharan Africa
Bhutan	BTN	South Asia
Bolivia	BOL	Latin America and Caribbean
Cabo Verde	CPV	Sub-Saharan Africa
Cambodia	KHM	East Asia and Pacific
Cameroon	CMR	Sub-Saharan Africa
Comoros	COM	Sub-Saharan Africa
Congo, Republic of the	COG	Sub-Saharan Africa
Côte d'Ivoire	CIV	Sub-Saharan Africa
Djibouti	DJI	Middle East and North Africa
Egypt, Arab Republic of	EGY	Middle East and North Africa
El Salvador	SLV	Latin America and Caribbean
Eswatini	SWZ	Sub-Saharan Africa
Ghana	GHA	Sub-Saharan Africa
Haiti	HTI	Latin America and Caribbean
Honduras	HND	Latin America and Caribbean
India	IND	South Asia
Indonesia	IDN	East Asia and Pacific
Iran, Islamic Republic of	IRN	Middle East and North Africa
Kenya	KEN	Sub-Saharan Africa
Kiribati	KIR	East Asia and Pacific
Kyrgyz Republic	KGZ	Europe and Central Asia
Lao People's Democratic Republic	LAO	East Asia and Pacific
Lebanon	LBN	Middle East and North Africa
Lesotho	LSO	Sub-Saharan Africa
Mauritania	MRT	Sub-Saharan Africa
Micronesia, Federated States of	FSM	East Asia and Pacific
Mongolia	MNG	East Asia and Pacific
Morocco	MAR	Middle East and North Africa
Myanmar	MMR	East Asia and Pacific
Nepal	NPL	South Asia
Nicaragua	NIC	Latin America and Caribbean
Nigeria	NGA	Sub-Saharan Africa
Pakistan	PAK	South Asia
Papua New Guinea	PNG	East Asia and Pacific
Philippines	PHL	East Asia and Pacific
Samoa	WSM	East Asia and Pacific
São Tomé and Principe	STP	Sub-Saharan Africa

Country	Code	Region
Senegal	SEN	Sub-Saharan Africa
Solomon Islands	SLB	East Asia and Pacific
Sri Lanka	LKA	South Asia
Tajikistan	TJK	Europe and Central Asia
Tanzania	TZA	Sub-Saharan Africa
Timor-Leste	TLS	East Asia and Pacific
Tunisia	TUN	Middle East and North Africa
Ukraine	UKR	Europe and Central Asia
Uzbekistan	UZB	Europe and Central Asia
Vanuatu	VUT	East Asia and Pacific
Vietnam	VNM	East Asia and Pacific
West Bank and Gaza	PSE	Middle East and North Africa
Zimbabwe	ZWE	Sub-Saharan Africa
Upper middle-income economies (2021 GNI per capita US$4,256 to US$13,205)*		
Albania	ALB	Europe and Central Asia
American Samoa	ASM	East Asia and Pacific
Argentina	ARG	Latin America and Caribbean
Armenia	ARM	Europe and Central Asia
Azerbaijan	AZE	Europe and Central Asia
Belarus	BLR	Europe and Central Asia
Belize	BLZ	Latin America and Caribbean
Bosnia and Herzegovina	BIH	Europe and Central Asia
Botswana	BWA	Sub-Saharan Africa
Brazil	BRA	Latin America and Caribbean
Bulgaria	BGR	Europe and Central Asia
China	CHN	East Asia and Pacific
Colombia	COL	Latin America and Caribbean
Costa Rica	CRI	Latin America and Caribbean
Cuba	CUB	Latin America and Caribbean
Dominica	DMA	Latin America and Caribbean
Dominican Republic	DOM	Latin America and Caribbean
Ecuador	ECU	Latin America and Caribbean
Equatorial Guinea	GNQ	Sub-Saharan Africa
Fiji	FJI	East Asia and Pacific
Gabon	GAB	Sub-Saharan Africa
Georgia	GEO	Europe and Central Asia
Grenada	GRD	Latin America and Caribbean
Guatemala	GTM	Latin America and Caribbean
Guyana	GUY	Latin America and Caribbean
Iraq	IRQ	Middle East and North Africa
Jamaica	JAM	Latin America and Caribbean
Jordan	JOR	Middle East and North Africa

Country	Code	Region
Kazakhstan	KAZ	Europe and Central Asia
Kosovo	XKX	Europe and Central Asia
Libya	LBY	Middle East and North Africa
Malaysia	MYS	East Asia and Pacific
Maldives	MDV	South Asia
Marshall Islands	MHL	East Asia and Pacific
Mauritius	MUS	Sub-Saharan Africa
Mexico	MEX	Latin America and Caribbean
Moldova	MDA	Europe and Central Asia
Montenegro	MNE	Europe and Central Asia
Namibia	NAM	Sub-Saharan Africa
North Macedonia	MKD	Europe and Central Asia
Palau	PLW	East Asia and Pacific
Paraguay	PRY	Latin America and Caribbean
Peru	PER	Latin America and Caribbean
Russian Federation	RUS	Europe and Central Asia
Serbia	SRB	Europe and Central Asia
South Africa	ZAF	Sub-Saharan Africa
St. Lucia	LCA	Latin America and Caribbean
St. Vincent and the Grenadines	VCT	Latin America and Caribbean
Suriname	SUR	Latin America and Caribbean
Thailand	THA	East Asia and Pacific
Tonga	TON	East Asia and Pacific
Türkiye	TUR	Europe and Central Asia
Turkmenistan	TKM	Europe and Central Asia
Tuvalu	TUV	East Asia and Pacific
High-income economies (2021 GNI per capita US$13,205 or more)*		
Andorra	AND	Europe and Central Asia
Antigua and Barbuda	ATG	Latin America and Caribbean
Aruba	ABW	Latin America and Caribbean
Australia	AUS	East Asia and Pacific
Austria	AUT	Europe and Central Asia
Bahamas, The	BHS	Latin America and Caribbean
Bahrain	BHR	Middle East and North Africa
Barbados	BRB	Latin America and Caribbean
Belgium	BEL	Europe and Central Asia
Bermuda	BMU	North America
British Virgin Islands	VGB	Latin America and Caribbean
Brunei Darussalam	BRN	East Asia and Pacific
Canada	CAN	North America
Cayman Islands	CYM	Latin America and Caribbean
Channel Islands	CHI	Europe and Central Asia

Country	Code	Region
Chile	CHL	Latin America and Caribbean
Croatia	HRV	Europe and Central Asia
Curaçao	CUW	Latin America and Caribbean
Cyprus	CYP	Europe and Central Asia
Czech Republic	CZE	Europe and Central Asia
Denmark	DNK	Europe and Central Asia
Estonia	EST	Europe and Central Asia
Faroe Islands	FRO	Europe and Central Asia
Finland	FIN	Europe and Central Asia
France	FRA	Europe and Central Asia
French Polynesia	PYF	East Asia and Pacific
Germany	DEU	Europe and Central Asia
Gibraltar	GIB	Europe and Central Asia
Greece	GRC	Europe and Central Asia
Greenland	GRL	Europe and Central Asia
Guam	GUM	East Asia and Pacific
Hong Kong SAR, China	HKG	East Asia and Pacific
Hungary	HUN	Europe and Central Asia
Iceland	ISL	Europe and Central Asia
Ireland	IRL	Europe and Central Asia
Isle of Man	IMN	Europe and Central Asia
Israel	ISR	Middle East and North Africa
Italy	ITA	Europe and Central Asia
Japan	JPN	East Asia and Pacific
Korea, Republic of	KOR	East Asia and Pacific
Kuwait	KWT	Middle East and North Africa
Latvia	LVA	Europe and Central Asia
Liechtenstein	LIE	Europe and Central Asia
Lithuania	LTU	Europe and Central Asia
Luxembourg	LUX	Europe and Central Asia
Macao SAR, China	MAC	East Asia and Pacific
Malta	MLT	Middle East and North Africa
Monaco	MCO	Europe and Central Asia
Nauru	NRU	East Asia and Pacific
Netherlands	NLD	Europe and Central Asia
New Caledonia	NCL	East Asia and Pacific
New Zealand	NZL	East Asia and Pacific
Northern Mariana Islands	MNP	East Asia and Pacific
Norway	NOR	Europe and Central Asia
Oman	OMN	Middle East and North Africa
Panama	PAN	Latin America and Caribbean
Poland	POL	Europe and Central Asia
Portugal	PRT	Europe and Central Asia

Country	Code	Region
Puerto Rico	PRI	Latin America and Caribbean
Qatar	QAT	Middle East and North Africa
Romania	ROU	Europe and Central Asia
San Marino	SMR	Europe and Central Asia
Saudi Arabia	SAU	Middle East and North Africa
Seychelles	SYC	Sub-Saharan Africa
Singapore	SGP	East Asia and Pacific
Sint Maarten (Dutch part)	SXM	Latin America and Caribbean
Slovak Republic	SVK	Europe and Central Asia
Slovenia	SVN	Europe and Central Asia
Spain	ESP	Europe and Central Asia
St. Kitts and Nevis	KNA	Latin America and Caribbean
St. Martin (French part)	MAF	Latin America and Caribbean
Sweden	SWE	Europe and Central Asia
Switzerland	CHE	Europe and Central Asia
Taiwan, China	TWN	East Asia and Pacific
Trinidad and Tobago	TTO	Latin America and Caribbean
Turks and Caicos Islands	TCA	Latin America and Caribbean
United Arab Emirates	ARE	Middle East and North Africa
United Kingdom	GBR	Europe and Central Asia
United States	USA	North America
Uruguay	URY	Latin America and Caribbean
Virgin Islands (U.S.)	VIR	Latin America and Caribbean
Unclassified		
Venezuela, RB**	VEN	Latin America and Caribbean

Note: GNI= gross national income.

* Calculated using the World Bank Atlas method as of July 1, 2022.

** Venezuela was temporarily unclassified in July 2021.

Reform of formal Technical and Vocational Education and Training (TVET) is urgently needed in most low- and middle-income countries (L/MICs). Demographic trends, coupled with higher rates of students completing lower levels of education, can lead to an exponential increase in the number of secondary TVET students in the next 20 years, particularly in low-income countries. Yet, because of a broken link between TVET systems and labor markets in L/MICs, TVET cannot deliver on its promise. This report offers guidance to policymakers designing and implementing TVET reforms, emphasizing core principles and practical considerations for L/MICs. Getting TVET right is challenging but possible and the time for reform is now. Fortunately, there are many opportunities to leapfrog using new data and evidence, technology, and the lessons learned during the COVID-19 pandemic.

The report focuses on secondary and post-secondary non-tertiary formal TVET, defined as TVET obtained within the formal education system that leads to diplomas, degrees, or other formal certifications. The report has three parts. The first, 'The TVET Promise,' looks at the potential of TVET systems to deliver access to equitable, quality, and relevant training and contribute to employment and productivity in support of a sustainable economic transformation. The second, 'The TVET Challenge,' articulates the main observed challenges for L/MIC TVET systems. The last part, 'The Way Forward to Better TVET,' proposes three interrelated transformations (striving for **Excellence**, focusing on **End results**, and making decisions based on **Evidence**) and six policy priorities to help TVET deliver on its promise in L/MICs and discusses how these three transformations can be achieved and sustained.

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