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Sustainable
Development
Goals

Pathways

of progression

Linking technical and vocational
education and training with
post-secondary education

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Linking technical and vocational education
and training with post-secondary education

Simon Field and Ava Guez

UNESCO Education Sector

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List of acronyms and abbreviations

- HEIs** higher education institutions
- ICT** information and communications technology
- ILO** International Labour Organization
- ISCED** International Standard Classification of Education
- MOOCs** massive online open courses
- NQF** National qualification framework
- RPL** recognition of prior learning
- SDG** Sustainable Development Goal
- STEM** science, technology, engineering and maths
- TVET** technical and vocational education and training

Summary and policy guidelines

Further learning opportunities are vital for TVET graduates

In the past, few graduates of initial vocational training aspired to higher levels of education. But higher-level qualifications are now a common expectation among young people, reflecting increased ambitions, labour market demand for higher-level skills, and a need to upskill and reskill throughout life. At the same time, the perception of academic school education as the natural route to university underlines the importance of demonstrating that technical and vocational education and training (TVET) programmes can also open a pathway to lifelong learning, including higher education.

UNESCO and others are now putting a spotlight on this issue

In response, UNESCO and other international bodies are now giving increasing attention to opportunities for further learning for TVET graduates. UNESCO (2016) is recommending that 'Member States should develop pathways and facilitate transitions between secondary, post-secondary and tertiary education including flexible admission procedures and guidance, credit accumulation and transfer, bridging programmes and equivalency schemes that are recognized and accredited by relevant authorities. TVET institutions, and other education institutions and authorities, should collaborate for the implementation of such measures'. This publication looks at how this recommendation might be implemented, and proposes policy guidelines, which have been published separately (UNESCO, 2018a).

Effective pathways serve multiple goals

Effective pathways allow those with TVET qualifications or practitioner backgrounds to have a full opportunity to benefit from further, post-secondary (including higher) education. This does not mean that those with TVET backgrounds 'should' pursue post-secondary or higher education, but rather

that they should face no unreasonable hindrances if they wish to do so. Effective pathways serve several policy goals. They:

- increase the attractiveness of initial TVET by meeting student aspirations, and remove any perception of TVET tracks as dead-ends;
- reduce inequality, including gender inequality, and promote social inclusion and mobility, by opening up post-secondary education to a wider group of people, including the most disadvantaged;
- help to meet growing economic demands for higher-level skills and qualifications;
- support lifelong learning, so that individuals can continue to develop knowledge and skills throughout their adult lives, and economies can adapt the skills of the workforce in response to technical and economic change;
- remove artificial barriers, such as requirements to repeat course material, that increase the costs of learning and prevent some from realizing their full potential.

Pathways in a changing world; governance, diversification and changing labour markets

Many features of country skill systems bear on the development of pathways:

- Sometimes initial TVET is under the responsibility of a single ministry, but governance is often fragmented between different ministries, potentially presenting an obstacle to effective pathways.
- Equity is a major challenge in TVET. But TVET programmes, linked to pathways of progression, can be a powerful tool to assist vulnerable and disadvantaged groups, women and migrants, to improve their life chances through skills and work and access to certification.

- Informality in the labour market is widespread. Often a key policy objective will be to re-engage those working in the informal sector, recognizing the skills acquired, and encouraging their upskilling.
- There has also been both growth and diversification in post-secondary education and training, while the for-profit sector has played a rapidly growing role. Diversification provides TVET graduates with opportunities, in that they have more choice, but also obstacles in that it can cause confusion.
- The demand for skills is changing globally, in response to computerization, outsourcing, environmental concerns and other factors associated with globalization. While these global trends provide limited guidance on country-specific skills needs, they do imply a clear need for country skills systems to be nimble, and capable of offering reskilling and upskilling in response to the changing economic and labour market environment.

There are three groups of potential entrants into post-secondary education (ISCED 4–8)¹

These are:

- Entrants from initial TVET (ISCED 2–3). This transition is critical in removing the stigma of a dead-end from the vocational track.
- Entrants from short-cycle post-secondary TVET (ISCED 4–5) to higher education (ISCED 6–8). While short-cycle post-secondary TVET programmes may sometimes be smoothly articulated with bachelors' programmes (allowing one or two years' course exemptions), such articulation is highly variable across countries and institutions. Graduates and drop-outs from higher education may also wish to enter post-secondary TVET.

¹ This document refers to levels in the International Standard Classification of Education (ISCED): for details see <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf> (accessed 19 April 2018).

- Entrants from working life, including the informal economy. This transition may be very important in upskilling both mature adults and younger adults who have dropped out of school, and need to be re-engaged in learning.

Promoting pathways through transparency

Rapid growth in post-secondary education, alongside high levels of institutional autonomy, and variably regulated growth in the private sector, has sometimes led to fragmentation and confusion in the programmes on offer, both in the eyes of the prospective learners and employers. Several tools have been employed to improve transparency. Comprehensive national qualification frameworks (NQFs), encompassing TVET, post-secondary (including higher) education, can help to establish pathways between TVET and other programmes by locating all programmes in a common sequence of 'levels'.

A common currency of learning outcomes can identify what has been learned in one programme, and how that relates to the learning objectives of programmes to which an individual seeks entry. Mechanisms to allow recognition of prior learning (RPL) can help those with practical skills, and migrants without locally recognized qualifications, to establish their credentials, and thereby realize access to post-secondary education. Career guidance for TVET students also plays a critical role, but it needs to be supported by good data on labour market outcomes, so that students can see how much value post-secondary programmes offer.

Building bridges and promoting access

Many initial TVET programmes are designed simply to provide skills for a target occupation, with little of the broader educational content that would support further learning. At upper secondary level (ISCED 3) such programmes do not usually yield a university entrance qualification. As a result, it is often a challenge for TVET graduates to enter post-secondary programmes, including higher education, as they lack the basic and study skills, and often qualifications, necessary. Vocational upper secondary programmes should prepare students for future study and civic participation as part of their general education function, irrespective of future transitions. But in addition, bridging programmes, pursued

either during or after the programme of initial TVET, offer the opportunity to gain the skills and qualifications required to pursue further studies. They should be delivered flexibly, so that they are a real and not just a theoretical option. Bridging programmes are sometimes specific to certain tracks and pathways, and some access programmes are also offered by universities.

Opening the doors to post-secondary options

Higher education and other post-secondary institutions may not always see the value in entrants from TVET backgrounds; programmes tend to be organized around the needs of young full-time students. In response to evidence that higher education can too often serve as a mechanism for affluent parents to pass on their advantages to their children, there is pressure to 'widen participation' through entrants from non-traditional and disadvantaged backgrounds. Cost can be a deterrent to further study, and funding measures need to underpin access measures for TVET graduates. Pressure from employers can also encourage higher education to give more emphasis to the skills required in working life, thus giving more weight to those with prior vocational qualifications. Shorter post-secondary vocational programmes can allow those with initial vocational training to deepen their professional skills, but countries vary in the extent to which shorter post-secondary programmes are offered. For adults seeking to enter post-secondary and higher education from working life, modes of study need to be flexible and responsive to the needs of adults with busy working and home lives, requiring evening and weekend teaching, modularization and online provision.

Policy implementation needs to take account of country circumstances

These conclusions are very general, and policy implementation needs to take careful account of country circumstances, recognizing the diversity of UNESCO Member States, and differences in economic circumstances, labour markets, education and training systems and their governance. In practice, depending on the country circumstances, some elements of the guidelines will become priorities. Thus, for example, it may be necessary to prioritize the implementation of an NQF as a means of bringing coherence to a highly fragmented skills system. RPL will be particularly important for a country seeking to re-engage

working adults in learning. In the face of high levels of dropout, reform of upper secondary programmes may be needed to engage young people at risk and provide them with relevant labour market skills, while also offering opportunities for later upskilling and further learning.

Pathways depend on a solid foundation of high-quality initial TVET

Such a foundation offers the occupational training and workplace experience, transversal skills and general education that not only make a young person job-ready, but also enable them to benefit from further learning. High-quality initial TVET will attract able students who will naturally aspire to more demanding coursework, and will also expect to have avenues open to them that will let them fulfil this aspiration. It will also give confidence to institutions of further learning that graduates of initial TVET are prepared and ready for further learning. A key part of quality in initial TVET is the engagement of the working world, the ability to serve equity, and provide for learners with very diverse needs and backgrounds..

But many countries face challenges in the quality of initial TVET

Many countries face significant challenges in the quality of initial TVET, including both equity challenges and weak engagement by the world of work. This means that sometimes resolving these quality challenges must be the policy priority, rather than addressing subsequent pathways, and for that reason a high quality of initial TVET is described here as a precondition for the development of pathways. But very often it will make sense to address the quality of initial TVET alongside efforts to improve subsequent pathways, since those pathways are a major element in making initial TVET attractive to students.

The guidelines

Precondition: As a foundation for subsequent pathways, ensure that initial TVET is of high quality, that it is inclusive and serves equity, and through engagement with the world of work, reflects the needs of the labour market.

Policy recommendation 1: Promote progression pathways through transparency.

Measure 1.1 Use national qualifications frameworks to support transitions.

- National qualification frameworks (NQFs) should be developed and exploited, as a means of making TVET qualifications clearer to other stakeholders, and thereby supporting the transitions of TVET graduates. This means establishing a credible and transparent methodology for allocating qualifications to levels in the NQF, and allowing TVET qualifications to be compared, in terms of level, with general educational qualifications.

Measure 1.2 Support credit recognition agreements linked to learning outcomes.

- Support credit recognition agreements at bilateral, regional and national level, thus allowing TVET graduates readier access to programmes of further learning. In support of these objectives, emphasize learning outcomes as a means of comparing different education and training programmes.

Measure 1.3 Develop systems for recognizing prior learning.

- Develop systems for recognizing prior learning, thus allowing individuals who have gained practical skills (either formally or informally) to have their skills valued and recognized. This will grant them access to post-secondary education and training programmes, and credit recognition within those programmes. Design these systems, in the interests of equity, to ensure access by all those groups who might otherwise miss out on formal education and training.

Measure 1.4 Offer quality career guidance, backed by data on labour market outcomes.

- Offer high-quality career guidance to students, allowing TVET students and graduates to identify options for further learning. In support of that objective, collect and make available good-quality data on the outcomes from different TVET programmes and the returns from post-secondary education programmes

Policy recommendation 2: Design initial TVET to support lifelong learning, and augment it with bridges to more advanced programmes.

Measure 2.1 Build into initial TVET programmes a sufficient range of general knowledge and skills to support lifelong learning.

- Ensure that initial TVET prepares young people not only for a first job, but also for further learning. To this end, build transferable skills, including study skills, literacy, numeracy and digital skills, into vocational programmes and qualifications, equipping graduates with the skills needed to learn throughout their life, formally and informally, and supporting access to post-secondary education.

Measure 2.2 Provide optional bridging programmes for TVET students, allowing them to access post-secondary education.

- Provide optional bridging programmes to initial TVET students, either during or after their TVET programmes, allowing them to gain access to programmes of further learning, including higher education, and to succeed in those programmes. The programmes may offer study skills, basic skills of numeracy and literacy, and targeted preparation in given fields of study.

Policy recommendation 3: Remove the obstacles and fill the gaps in post-secondary provision.

Measure 3.1 Widen participation in post-secondary education, thus allowing more access for TVET graduates.

- To support the pathways from TVET into higher education, and to serve the interests of social mobility, excellence and diversity in higher education, encourage higher education and other post-secondary institutions to broaden their entrance criteria to give full recognition to TVET and practitioner competencies alongside academic skills. Underpin access measures for TVET entrants by funding arrangements that concentrate public financial aid on disadvantaged student groups.

Measure 3.2 Develop shorter post-secondary vocational programmes.

- Ensure that, alongside bachelor-level programmes in higher education institutions (HEIs), there is an adequate offer of shorter post-secondary vocational programmes of between a few months and two years if studied full time. Such programmes help to meet the need for mid-level technical and professional qualifications, and provide a natural avenue of progression for graduates of initial TVET.

Measure 3.3 Meet the needs of adults.

- To suit the needs of adult students, institutions should allow for flexibility in time scheduling, and make full use of modern information and communications technology (ICT).

PART I: Introduction

Pathways: an emerging challenge

In the past, fewer graduates of initial vocational training aspired to further learning

For many years young people pursued initial technical and vocational education and training (TVET – see Box 1) in the simple expectation that it would lead to a skilled job. This training rarely supported progress to higher levels of education. At the same time, academic school education provided most students with qualifications at upper secondary (ISCED 3) level or below, and they then entered work. Post-secondary,² including higher education was reserved for a small minority. So, for most TVET students, the prospect of progress into higher level programmes was remote.

Box 1: Definition of TVET

Technical and vocational education and training' (hereinafter 'TVET') is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods. TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels, and includes work-based learning and continuing training and professional development which may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn and the development of literacy and numeracy skills, transversal skills and citizenship skills are integral components of TVET. (UNESCO, 2015)

But higher-level qualifications are now a widespread expectation

In developed and many developing countries, increasing proportions of young people are obtaining post-secondary qualifications, and an aspiration to these levels of education has become widespread. Upper secondary academic

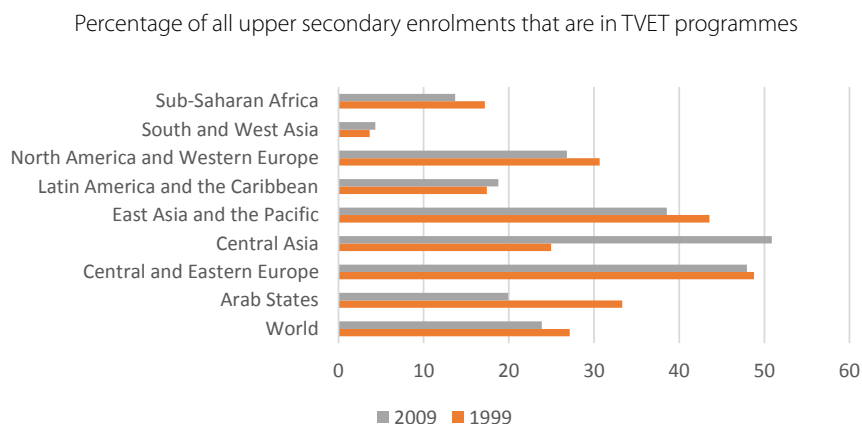
2 'Post-secondary' in this report refers to levels of education and training above upper secondary level, including higher education, at ISCED levels 4-8.

education at ISCED Level 3 is now commonly seen as the natural route to university programmes, a route that is attractive to parents, students and sometimes employers. Between 2000 and 2014 the global higher education gross enrolment ratio increased from 19 per cent to 34 per cent (UNESCO, 2017). But over most of the same period (between 1999 and 2009) the proportion of upper secondary enrolments that were vocational fell from 28 per cent to 24 per cent (see Figure 1). For the many who aspire to higher education, the upper secondary academic track appears a natural choice, sometimes crowding out competing vocational options. This historical transformation, although taking place in different forms and at different speeds across countries, is remarkably global.

Post-secondary vocational programmes have also expanded rapidly

Sometimes 'higher' education includes a tier of universities specializing in technical and professional programmes – often called universities of applied science. Shorter post-secondary professional and vocational programmes (ISCED 4 and 5) – which may not be regarded as higher education – are also growing fast, and are taught in a diversity of institutions (see Box 3). Graduates of upper secondary vocational programmes may seek entry to one or other of these shorter programmes, while graduates of these shorter post-secondary programmes may also seek entry to academic forms of higher education at ISCED 6 and above.

Figure 1. TVET as a proportion of all upper secondary programmes



Source: UIS database. Data extracted in August 2018 <http://data.uis.unesco.org>.

These changes reflect growing skills needs, but blocked pathways can create distortions and mismatches

Many of these changes reflect a growing need, in developing and developed economies, for higher-level skills. But they also reflect student aspirations which are not always in step with labour market needs, causing skills mismatches. Many developing and developed countries are reporting weak labour market outcomes for graduates of higher education, alongside skills shortages for technicians and artisans. This is bad for both the individual young people concerned and national economies. While this problem has different causes, one element is the pathways between TVET and post-secondary education. Blockages in these pathways make TVET appear to be a dead-end choice, ruling out subsequent progress to higher education. This may direct all young people who aspire to higher-level qualifications into academic routes from the earliest stage, distorting choices, and often also failing to respond to pressing labour market needs.

UNESCO has encouraged measures to open the pathway from TVET to further learning

Sustained efforts are now being made to clear the pathway from TVET to post-secondary education. In 2012, the Third International Congress on TVET in Shanghai encouraged governments to ‘support flexible pathways and the accumulation, recognition and transfer of individual learning through transparent, well-articulated outcome-based qualifications systems’, stressing the need to ‘link TVET with general education to ensure flexible pathways at all levels and facilitate the progression of TVET learners to higher levels of education (UNESCO, 2012)’. In 2015, UNESCO advanced a recommendation setting out how this should be pursued (UNESCO, 2016), while the 2016 Sustainable Development Goals (SDGs) provided underpinning through their emphasis on participation in TVET and access to tertiary education (see Box 2). Similarly, the European Commission, in its 2016 report on skills and transparency, argued that TVET not only needs to be more attractive, it also needs to demonstrate the capacity to progress to ‘higher vocational or academic learning’ (European Commission, 2016). The function of this publication is to explore how best to implement the UNESCO recommendation, in the light of a wide range of evidence drawn from country experience, including case studies of Chile, India, Japan, Kenya and the Netherlands, and to propose policy guidelines.

Box 2: UNESCO's 2015 recommendation and the Sustainable Development Goals

Recommendation 13: 'Member States should develop pathways and facilitate transitions between secondary, post-secondary and tertiary education including flexible admission procedures and guidance, credit accumulation and transfer, bridging programmes and equivalency schemes that are recognized and accredited by relevant authorities. TVET institutions, and other education institutions and authorities, should collaborate for the implementation of such measures.'

Source: UNESCO (2016).

This UNESCO goal is nested within the wider UN SDGs, particularly SDG 4 on quality education, which includes as targets:

- 'By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.
- By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.'

For more information on the UN Sustainable Development Goals see:
<https://sustainabledevelopment.un.org/>

Overarching rationale for policy guidelines. The rationale for effective pathways is to allow those with TVET qualifications or practitioner backgrounds to have a full opportunity to benefit from post-secondary, including higher education. This does not mean that those with TVET backgrounds 'should' pursue post-secondary or higher education, but rather that they should face no unreasonable hindrances if they wish to do so. Effective pathways serve several policy goals. They:

- increase the attractiveness of initial TVET by meeting student aspirations, and remove any perception of TVET tracks as dead-ends;
- reduce inequality, including gender inequality, and promote social inclusion and mobility, by opening up post-secondary education to a wider group of people, including the most disadvantaged;
- help to meet growing economic demands for higher-level skills and qualifications;

- support lifelong learning, so that individuals can continue to develop knowledge and skills throughout their adult lives, and economies can adapt the skills of the workforce in response to technical and economic change;
- remove artificial barriers, such as requirements to repeat course material, that increase the costs of learning and prevent some from realizing their full potential.

This publication proposes measures to address the challenge

Part II describes some relevant context, including the growth and diversification of post-secondary education, institutional variations in the governance of TVET that bear on pathways, and relevant labour market developments, including informality, and how countries can address them. Part III describes three pathways into post-secondary and higher education: from upper secondary TVET, from post-secondary TVET, and from working life. Part IV identifies three main obstacles to effective pathways, and describes the tools now being used by countries to overcome these obstacles. First, in the face of growth in post-secondary provision which can be confusing for students and other stakeholders, it looks at a set of measures designed to make the system more transparent. These measures include national qualification frameworks (NQFs), recognition of prior learning (RPL), definition of programmes in terms of learning outcomes, and career guidance. Second, it looks at a set of measures designed to bridge the gulf between TVET programmes and post-secondary, including higher education programmes, including for those in the informal economy. These bridging programmes are designed to prepare TVET students to enter and succeed in further learning. Third, it examines how post-secondary options might be broadened, and how modes of study might be adapted to the needs of adults who often have many other demands on their time. Section 4 also identifies a set of policy guidelines to support effective pathways. Section 5 discusses how the policy guidelines might be implemented in different countries, taking account of country diversity.

PART II: Contexts for reform

Country contexts are variable and changing

This section looks at some key contextual factors which bear on pathway development, and efforts to expand opportunities for TVET graduates. The organization of TVET in countries ranges from unitary country systems within ministries of education to highly decentralized systems with multiple loci of decision and control. The post-secondary institutional landscape is changing, with the emergence of different types of private and public providers, with major implications for the development of pathways. Finally, the broader contexts of the labour market and other institutions affect both post-secondary education and TVET, and influence the development of pathways.

The organization of initial TVET

Sometimes an upper secondary TVET track is organized by the education ministry

Initial TVET takes multiple forms. Sometimes it is organized by a ministry primarily responsible for the education system, and is typically delivered in upper secondary vocational or technical schools. This arrangement is found, for example, in China. Lower secondary vocational education is becoming less common – although it remains, for example, in countries such as Burkina Faso and Kenya (Kingombe, 2011). Sometimes initial TVET is not seen as a secondary education track, and is organized quite separately from the education system.

But governance is often more complex and fragmented

Initial vocational training may be organized by a ministry separate from that responsible for general education, or by an agency (particularly if it is supported by a training levy). Sometimes this offers a separate competing track to that provided by ministries of education. For example, in South Africa, the Department of Basic Education offers upper secondary technical schools, while the Department of Higher Education and Training administers a network of TVET

colleges offering a rather different set of programmes (Field et al., 2014). In Costa Rica, the Ministry of Education offers upper secondary TVET in technical schools, but a separate training agency, funded by a training levy (INA) also offers initial vocational training (Alvarez-Galvan, 2015a). Sometimes government ministries also take responsibility for training in their domains of responsibility – the health ministry for health professions, the agriculture ministry for agricultural professions and so on. This creates a further dimension of complexity, although the broad tendency of governance reforms is to bring these responsibilities for training under one ministerial roof, a move paralleled, at local and institutional level, by those to create, through amalgamation, training institutions responsible for several professions.

Fragmented governance may be one obstacle to effective pathways

Different types of initial TVET, with different governance arrangements, create many challenges to mutual recognition of qualifications and articulation, and these naturally impact on pathways to post-secondary education. Sometimes centralizing responsibilities under one ministry can bring coherence to the vocational training system, and foster articulation and credit recognition between different parts of the system, including post-secondary education, if these also fall under the responsibility of the ministry. But there are counter-arguments: large government departments can be unwieldy, and the issue of government machinery for managing vocational education and training is outside the scope of this paper (see UNESCO and ILO (2018) for an extensive discussion of different governance and inter-ministerial co-ordination mechanisms). So sometimes a complex and fragmented landscape of governance may be part of the challenge in establishing pathways between TVET and post-secondary and higher education. Later sections examine some of the tools available to establish more coherence and transparency in the system, including measures such as national qualification frameworks (NQFs) and career guidance.

Informality in economies needs to be addressed

In many countries, particularly developing countries, there are large informal economies, outside the scope of government regulation. In more than half of a wide range of countries surveyed by the International Labour Organization

(ILO), informal employment made up more than half the total, and in over 30 per cent of the countries, informal employment represented two-thirds of the total (agriculture excluded in both cases; ILO, 2013). Many young people working informally may have had patchy school education or dropped out early. At the same time, informal employment offers the opportunity to develop skills, and sometimes, as in the traditional (informal) apprenticeships found in some African countries, a semi-structured training arrangement exists (Ahadzie, 2009). While some policy responses seek to bring more workers and jobs into the formal sector, others, recognizing informality as a fact, seek to work with the grain of the informal economy and encourage positive developments within the informal sector, including more training.

A large informal sector makes the route from informal employment to further learning crucially important

The existence of a large informal sector has major implications for pathways into post-secondary education. First, policy measures need to give the informal sector sufficient attention: improving access from upper secondary TVET to higher education will achieve rather little in equity terms if, as in many developing countries, most disadvantaged young people drop out of school and enter the informal economy. Second, a large informal economy highlights the importance of the route from working life back into education and training. This route, and how it may be supported by recognition of prior learning (RPL), is discussed further below (see also Box 8).

Diversification in post-secondary education and training

Alongside growth has come diversification

Alongside growth, there has been increasing diversification in post-secondary education. 'Universities' now include subcategories of technical and professional universities, universities of applied science and university colleges and polytechnics, names with meanings that vary across countries, but most commonly referring to HEIs with a technical and/or professional orientation,

with an emphasis on training for technical and professional jobs, linked often to applied research. In some countries – such as the Netherlands with its universities of applied science (HBOs) – there is a separate designated tier of HEIs, different from academic universities, and with different missions and governance arrangements (see Box 3). But in other countries the distinction may emerge in the different missions of individual HEIs.

Box 3: Universities of applied science in Austria and the Netherlands

In **Austria**, graduation rates in tertiary-type A programmes (a measure of the proportion of a population cohort gaining tertiary qualifications) have nearly trebled, rising from 10 per cent to 29 per cent between 1995 to 2009. A lot of this growth is attributable to the rapid development of Fachhochschulen, which provide bachelor's and master's-level qualifications. Just over 40 per cent of the 350 programmes were in technology and engineering in 2010/11, one-third in economic sciences and 14 per cent in health sciences. Programmes follow a more 'school-like' structure than universities, with limited alternatives for optional subjects and stricter timetables. Programmes are modularized. More than half (56 per cent) of the graduates from bachelor programmes continue at master's level. There were three applicants on average for each study place in 2010/11 (eight applicants per place in health sciences).

Adapted with permission from Musset, P., et al. (2013), A Skills beyond School Review of Austria, OECD Reviews of Vocational Education and Training, OECD Publishing
<https://doi.org/10.1787/9789264200418-en>

In the **Netherlands**, the post-secondary vocational system includes thirty-nine public universities of applied science (hogescholen) delivering a wide range of professional bachelor and associate degree programmes and between eighty and ninety (typically much smaller) private institutions providing professional bachelor's degree programmes, associate degrees, and a few hundred institutions providing a wide range of shorter courses. Most programmes in public institutions are full time. Both full and part-time professional bachelor programmes last four years and associate degrees two years. In 2012, 421,000 students were enrolled in over 1,200 professional bachelor programmes, and just 4,500 in 140 associate degree programmes. Associate degrees largely correspond to the first two years of professional bachelor's degree programmes. Students with a professional bachelor's degree can continue to study in academic or professional master's programmes, which last an additional one to two years depending on previously obtained knowledge and skills.

Adapted with permission from Fazekas, M. and I. Litjens (2014), A Skills beyond School Review of the Netherlands, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris,
<https://doi.org/10.1787/9789264221840-en>.

Many shorter post-secondary programmes have emerged

Shorter programmes, at ISCED 4 and 5, are often delivered in colleges of different types – such as community colleges in the United States of America. These include programmes that are up to two years if pursued full time, and might be designated as certificates, diplomas, and sometimes foundation or associate degrees. Many of these programmes are vocational or professional. Professional examinations and occupational certifications of different types, where the focus may be more on the examination, with fewer formal requirements for a programme of study, may sometimes be assimilated to these programmes (see OECD, 2014 and Box 4).

The private sector has played a rapidly growing role

In many countries, private for-profit institutions have met some of the growth in demand for post-secondary education. Often this has been because public institutions, fully funded by government so that tuition fees are low or zero, have been constrained by their limited budgets, and so their growth has not kept pace with burgeoning demand. For those who cannot gain free or low-cost places in public institutions, but who can afford to pay, private markets have emerged in many countries for education and training provision. In some developing countries, the private sector has been subject to limited regulation. In Zambia, for example, only 20 per cent of the technical and commercial training institutions on the government register (i.e. approved for government funding) are owned by government, the rest being owned by churches, private organizations and other independent agencies (Kingombe, 2011).

Diversification provides TVET graduates with opportunities

This diversification has multiple implications for the opportunities for initial TVET graduates. Often, higher-level vocational programmes provide graduates of initial TVET with a natural route of professional development, allowing them to deepen technical and professional skills, and acquire additional skills, such as entrepreneurial or management capacity, or to make sideways career moves. These options not only help to meet the increasing and changing skills requirements in the economy but also serve to make the choice of initial TVET programmes more attractive, by offering natural routes of progression

and career development. In addition, even if these programmes are not in themselves 'higher' education (because they may be at ISCED levels 4 and 5), and even if they do not take place in a university setting, they may provide a bridge to higher education at bachelor's level (ISCED 6), through some form of articulation or credit recognition within a subsequent higher education programme. In these respects, this type of diversification may be very positive.

Box 4: Short-cycle post-secondary TVET programmes

Short-cycle post-secondary TVET programmes may be defined as those that are above upper secondary level, but less than a full bachelor's degree, typically involving between six months and two years of full-time study. Such programmes are not always very visible internationally, because they are neither 'school' nor 'university', but they serve a very important role in the skills systems of many countries, in providing mid-level professional skills. This includes programmes at ISCED levels 4 and 5.

In the USA, for example, around 12 per cent of the labour force have a post-secondary certificate as their highest qualification, and certificate graduation rates are burgeoning, tripling in recent years. A further 10 per cent have associate degrees. In France, in 2010-11 almost 360,000 students were enrolled in two-year professional programmes (Brevet de technicien supérieur and Diplôme universitaire de technologie), representing one-third of the students entering post-secondary education. In Korea, roughly one-third of the youth cohort enters junior college or polytechnic programmes, dominated by two-year professional programmes. In Sweden, the numbers enrolled in higher TVET programmes trebled between 2001 and 2011, while in Romania enrolments in 'post-high school' grew from 44,000 in 2005/06 to 70,000 in 2010/11.

Adapted with permission from OECD (2014), Skills beyond School: Synthesis Report, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, <https://doi.org/10.1787/9789264214682-en>.

But sometimes diversification also creates obstacles

For young graduates of initial TVET, the increasingly complex field of competing post-secondary programmes can present some difficult choices, in the face of very limited information and guidance. 'More' options do not automatically translate into 'better' options in the face of weak information, and the labour market outcomes from different programmes are often hard to discern. Some apparently attractive programmes may turn out to offer few additional skills, and little prospect of advancement into higher education.

Labour market contexts

Demand for skills is changing

In more developed economies, evidence has accumulated of a ‘hollowing-out’ or ‘hourglass’ effect, whereby demand both for high-level skills (like physicians) and for people to undertake low-skilled non-routine jobs (like cleaning) remains robust, while routine mid-level jobs like telephone sales assistants are replaced by technology and outsourcing (Autor et al., 2003). In less-developed countries, where labour costs are lower, this development may be slower, and complicated by outsourcing in some domains – for example allowing a country like India to develop an extensive industry in IT services, outsourced from other countries.

But global trends provide limited guidance on country-specific skills’ needs

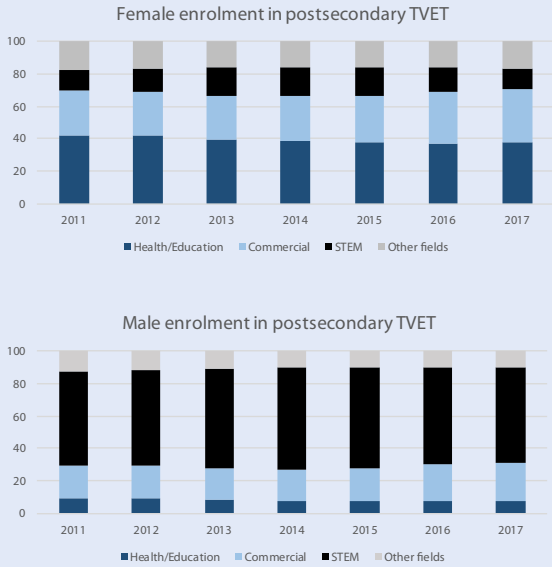
These global developments do not permit simple conclusions about specific skills requirements in individual countries or about the required skill profiles of graduates either from initial TVET or from post-secondary programmes. Apart from anything else, highly unpredictable political developments may have big effects on the development of individual economies and international trade flows. The scale, pace and unpredictability of these changes have implications for the institutions that guide provision of education and training. Country skills systems will need to be nimble, and respond quickly to rapid change, taking advantage of opportunities by providing new skills, while also responding to the needs of those working in declining sectors.

Gender and other equity challenges are also salient

Gender segregation by occupation, and associated inequality in the labour market, is mirrored by similar patterns in both upper secondary and post-secondary vocational training. Science, technology, engineering and maths-oriented (STEM) occupations and professions too often remain dominated by men. The pattern in Chile is repeated in many countries (see Box 5).

Box 5: In Chile, as in many countries, STEM fields of study are dominated by men

While men and women are enrolled in equal proportions in secondary TVET, men are more likely to be found in industrial programmes, such as electricity, construction and metalworking, while women tend to pursue personal service programmes which include child care, health care, gastronomy and so on. This pattern is repeated at post-secondary level. About 50 per cent of male students enrol in programmes in STEM fields, compared with only 15 per cent of their female counterparts. There is little evidence of any convergence over time.



Source: UNESCO (2018b).

Unpredictable changes in skills demand imply an emphasis on lifelong learning

The workforce needs to be equipped to cope with changing skills needs. This implies an emphasis on lifelong learning and often on shorter education and training programmes – it is harder to justify the personal or social investment in a three or four-year degree programme for someone who is already halfway through their working life. It also implies that initial TVET programmes need to build in sufficient core academic skills to sustain further learning and allow for reskilling and upskilling at later points in a person’s career. So, unpredictability in itself has implications for policy.

A precondition for learning pathways

Pathways depend on a solid foundation of high-quality initial TVET

Such a foundation offers the occupational training and workplace experience, transversal skills and general education that not only make a young person job-ready, but also enable them to benefit from further learning. High-quality initial TVET will attract able students who will naturally aspire to further learning, and will expect to have avenues allowing them to fulfil this aspiration. It will also give confidence to institutions of further learning that graduates of initial TVET are prepared and ready for more demanding coursework.

High-quality TVET can and should serve equity

For those with disadvantaged backgrounds, initial TVET should be accessible and supportive, aiming to compensate for weaknesses in the initial education and preparation of programme entrants by directing support to those who need it most, and helping them to succeed. It should serve gender equity by ensuring that women are seen and treated as effective candidates for the most demanding and highest-status pathways (including, but not only, STEM pathways) often leading to the best-paid jobs. This foundation of equity in initial TVET ensures that opportunities to benefit from pathways of further learning are open and equitable.

A key part of quality in initial TVET is the engagement of the working world

Engagement of the working world describes the involvement of employers and trade unions, both in the development of qualifications and curricula, and more practically, through work placements and apprenticeships. This engagement ensures that the skills and knowledge acquired by graduates of initial TVET are relevant to the changing needs of the economy, thus smoothing the transition from school to work, or into employment for adults who may previously not have been in employment or have worked in the informal economy. This grounding of initial TVET in the requirements of the economy also ensures that subsequent learning pathways are founded on connection with the labour market, underpinning the career prospects of those who follow those pathways.

But many countries face challenges in the quality of initial TVET

Many countries face significant challenges in the quality of initial TVET, including both equity challenges and weak engagement by the world of work. This means that resolving these challenges will often be the policy priority, rather than addressing subsequent pathways, and for that reason a high quality of initial TVET is described here as a precondition for the development of pathways. But very often it will make sense to address the quality of initial TVET alongside efforts to improve subsequent pathways, since those pathways are a major element in making initial TVET attractive to students.

Precondition: As a foundation for subsequent pathways, ensure that initial TVET is of high quality, that it is inclusive and serves equity, and through engagement with the world of work, reflects the needs of the labour market.

PART III: Three groups and three pathways

This section looks at three groups of TVET entrants into post-secondary education

Three main groups of individuals with TVET and practitioner backgrounds may seek entry into post-secondary education. The first group comprises graduates from initial TVET who wish to pursue various forms of post-secondary education; the second includes those with short post-secondary TVET qualifications, who wish to continue their studies at bachelor's level (ISCED 6) in a university setting; the third group is adults from working life with practitioner and TVET backgrounds who wish to pursue further learning. These three groups, and the pathways they imply, will be considered in turn.

From initial TVET to post-secondary, including higher, education

This pathway reflects both labour market needs for higher skills and student aspirations

Initial TVET graduates may want to progress to post-secondary or higher education (ISCED levels 4-6), because such progression offers greater specialization, meets student aspirations (Vlaardingerbroek and Hachem El-Masri, 2008), and delivers better job opportunities, higher salaries and social recognition (Vlaardingerbroek and Hachem El-Masri, 2008). Effective pathways of this type also send a strong signal that TVET is not a dead end, increasing the status of TVET, attracting more students and therefore filling labour market needs.

Initial TVET programmes need to decide how much general education to include

There is a dilemma in deciding whether to build in to upper secondary TVET programmes the academic content required for a national school-leaving/university entrance exam. Countries such as Costa Rica and France do so, thus making all those who pursue the TVET pathway formally eligible for higher education, assuming success in the school-leaving exam. While this has the advantage of opening the door to higher education, it may raise other difficulties because of the academic burden. In Costa Rica, the requirements on those in the technical school programme are to pursue not only the full academic load required for the school leaving examination, but also vocational preparation (OECD, 2017). This means that it can be an academically demanding pathway, not suitable for those young people who struggle with some academic subjects, but are attracted to practical learning. So a more open pathway to higher education for TVET graduates is purchased at the price of inclusiveness at upper secondary level. The alternative model is to exclude the school-leaving/university entrance examination from the upper secondary TVET programme, easing the academic pressure, but also exposing the TVET programme to a greater risk of being seen as a dead end.

There is also some tension between immediate labour market needs and broader educational requirements

Atchoarena and Delluc (2002) describe a related tension in African countries. In Francophone Africa, TVET tends to be a closely integrated part of the initial education system, providing a range of general skills but at the cost of some distance from labour market needs. In Anglophone Africa, TVET tends to be much more closely linked to labour market needs, but the academic content is extremely limited.

Short-cycle post-secondary TVET to higher education

Sometimes articulation with higher education is smooth

‘Short-cycle post-secondary TVET’ (at ISCED 4 and 5) refers to substantial vocational programmes, above upper secondary level, but below bachelor level at university. This typically means that they last between six months and two years if pursued full time (see OECD, 2014). Some upper secondary TVET graduates pursue such programmes with the aim of continuing into a longer university programme. In these cases, post-secondary programmes offer a more accessible alternative to university, in terms of both fees and entry level. This is especially the case in systems with ‘community’ or ‘junior’ colleges based on the US model, such as Canada, Indonesia, the Republic of Korea and Jamaica (Hastings, n.d.). Students earn an associate degree in their first two years in a community college, before transferring to a university for the last two years to earn a bachelor’s degree. Such programmes are especially attractive for disadvantaged students, because of the local accessibility of short-cycle programmes, and (sometimes) their affordability compared with a classical four-year undergraduate programme in university (Hastings, n.d.). In Singapore too, post-secondary TVET is seen as not only an industry-ready exit qualification but also a viable stepping stone to university (Agrawal, 2013).

But higher education institutions can be reluctant to offer recognition

For example, in Thailand, many universities do not formally recognize the qualifications of students coming from community colleges, requiring them to start the general degree programme from the first year even when they have already earned an associate degree (Hastings, n.d.). Similarly, in Austria, TVET college qualifications (at ISCED 4) are often not adequately recognized in HEIs (Musset et al., 2013). In Australia, despite a helpful NQF, only 9 per cent of higher education undergraduate entrants come from (vocational) TAFE colleges (Moodie, 2010, cited in Wheelahan, 2014).

Working life to post-secondary education

This transition may answer the increasing demand for lifelong learning

Many adults return to study to change or enhance their careers, sometimes in response to rapid economic change (Kazis et al., 2007). In response, post-secondary institutions and HEIs have identified adults as an increasingly important client group (de Viron et al., 2011). In South Africa for example, the National Plan for Higher Education proposed the recruitment of more non-traditional learners, including workers and adults, to increase participation rates (Walters, 2015). But progress has sometimes been slow: in the European Union, participation by 25 to 64-year-olds in education and training increased only slightly from 7 per cent in 2000 to 11 per cent in 2016 (European Commission unpublished report, data from Eurostat). Between 2003 and 2010, the proportion of European universities reporting that they had developed an overall strategy regarding lifelong learning went from 35 per cent to 39 per cent, with little evidence of more rapid development globally (de Viron and Davies, 2015).

The education and skills levels of the adult population is a key context

In fast-developing countries, the qualifications of adults typically lag far behind those of young people, and may no longer match the requirements of a developed economy. This implies strong potential demand for the education and training of adults. This demand needs to be met through flexible modes of study which are suitable for adults, avenues of access that recognize informal prior learning, and the supports necessary for adults with limited formal education to succeed in further study.

PART IV: Overcoming the obstacles: tools for success

The obstacles in summary

Three obstacles can be identified: fragmentation, a lack of bridges, and narrow options

Three obstacles stand in the way of effective pathways from TVET to post-secondary, including higher, education.

- First, there are many challenges in navigating a route through an education and training system that often appears, and often is, confused and complex. This is difficult because students lack the information to see their way through the system, while institutions lack the information that would help them appreciate the skills of those coming from TVET backgrounds.
- Second, there are often weak bridges between TVET and post-secondary, including higher, education, and a lack of measures that might more adequately prepare students for the demands of higher-level programmes, and support them during their studies.
- Third, there are many gaps and barriers in post-secondary education. Post-secondary education is often too costly for those who come from less favoured backgrounds, including those who have come through a TVET route, while study routines are commonly organized around the needs of young full-time students rather than those of adults wishing to enter post-secondary education but needing more flexible study timetables consistent with other demands on their lives.

So there are three challenges to be addressed

These three challenges imply three lines of attack designed to overcome them and establish effective pathways. They will be considered in turn below:

- In the face of fragmented systems, measures are needed to promote pathways through transparency.
- To facilitate access for students from TVET backgrounds to post-secondary and higher education, there is a need to design initial TVET to support lifelong learning.
- Given post-secondary institutions offering weak access to those from less favoured backgrounds and often organized around full-time school-leavers, measures are needed to remove the obstacles and fill the gaps in post-secondary provision.

Challenge 1: fragmentation and a lack of transparency

Rapid growth sometimes leads to fragmentation and confusion

In some developing countries, rapid growth in post-secondary education has been accompanied by limited regulation. In India for example, the number of TVET institutions has grown rapidly, but without clear progression pathways for TVET graduates into higher level programmes (Young and Allais, 2013). In Colombia, TVET students face many obstacles to educational progress: the National Training Service, SENA (the largest provider of TVET) and tertiary education institutions are very autonomous, so that each school is responsible for managing relations with the different training providers (OECD, 2016a). In Peru, the fragmentation of the TVET sector makes it hard for students to transfer without losing credit. Some universities award credit to TVET graduates, but arrangements are usually ad hoc, so that students cannot find out, in advance of enrolling in a TVET programme how many credits will transfer and where (McCarthy and Musset, 2016).

High levels of autonomy and a relatively unregulated private sector can compound complexity

Often post-secondary institutions, particularly universities, have a high level of institutional autonomy. Sometimes the private sector plays a large role in provision, and regulation is loose. These factors mean that individual post-secondary institutions often have full control over student selection, and more systematic multi-institutional attempts to implement access and credit recognition pathways are harder to implement. This is particularly common in Latin American countries such as Colombia (OECD, 2016a), Costa Rica (Proyecto Estado de la Nación, 2013) and Peru (McCarthy and Musset, 2016).

Overcoming the challenge: promoting pathways through transparency

Several tools promote transparency

Education systems use several tools to promote transparency in individual programmes and their learning outcomes for the different actors in the system – students, education and training institutions, and employers. These tools include NQFs, RPL, systematic credit transfer arrangements, and career guidance. Such tools are not usually designed specifically for, but have particular relevance to, TVET because of its inherent complexity, with hundreds of separate occupational qualifications.

National qualification frameworks might open pathways

Qualification frameworks are designed to group individual qualifications on a linear scale from lower to higher levels – for example 1 to 10. This means that a gatekeeper to a post-secondary programme can see that an otherwise obscure vocational qualification is (say) at level 4, and therefore perhaps an appropriate prior qualification for entry to a programme at level 5. Thus the NQF in Australia permitted formal pathways from post-secondary TVET courses into bachelor's degrees, whereby TVET graduates receive credits for subject, units or years of study that they have followed, which are taken into consideration when they

apply for related degree courses in general higher education (Ambrose et al., 2013). Many countries have introduced or are introducing NQFs, with European countries, through the European Commission and the European Qualifications Framework (EQF), giving them particular emphasis (see UNESCO et al., 2017). UNESCO (2015) advanced several recommendations in support of such frameworks, linked to learning outcomes and RPL (see Box 6).

But integration of TVET within qualification frameworks is challenging

To facilitate pathways between TVET and post-secondary education programmes, NQFs need to encompass both parts within the same framework. Countries such as Bangladesh, Botswana, Chile, Mexico, Sri Lanka and Tunisia at one time had NQFs exclusively concerned with vocational education (Allais et al., 2010), and, while some of these countries have now adopted more overarching NQFs, they have not yet been fully implemented. While an NQF limited to TVET may help to clarify the TVET system, it cannot compare TVET with general education qualifications and therefore contribute to smoothing the transition from one to the other. Many countries, especially in Europe (Cedefop, 2016), have set up overarching NQFs covering both vocational and general education and including higher education, and which can therefore recognize that some vocational and general tracks grant formally equal qualifications. But in Europe, only some include both general and vocational education at all ISCED levels. In others, general and vocational qualifications are either separated at higher levels – for example in Austria – or else the higher levels exclude vocational qualifications (European Commission, n.d.). Germany's NQF treats tertiary TVET and general higher education (at ISCED level 6 and 7) as 'equal, but different', meaning that the TVET qualifications cannot grant access to general tertiary education programmes at the next level (Cedefop, 2010). So in some circumstances an NQF can institutionalize the barriers between TVET and higher education, rather than overcome them.

Box 6: UNESCO's 2015 recommendations on qualifications frameworks, learning outcomes and recognition of prior learning

39. Well-articulated outcome-based qualifications frameworks or systems based on learning outcomes and relating to a set of agreed standards should be established, in consultation with stakeholders, based on identified needs including occupational standards.
40. Policy or regulatory mechanisms supporting horizontal and vertical progression should be established and include flexible learning pathways, modularization, the recognition of prior learning, accumulation and credit transfer. Special attention should be given to encouraging low-skilled and unskilled individuals to gain certification for access to further learning and decent work.
41. Systems for the recognition, validation and accreditation of knowledge, skills and competencies acquired through non-formal and informal learning should be promoted with the tripartite involvement, when relevant, of workers' representatives, employers' representatives and public authorities. Reliable assessment procedures and quality assured certification should be established in cooperation with relevant stakeholders.
42. Member States should promote the mutual recognition of qualifications at national, regional and international levels, in relation to the mobility of learners and workers.

Source: UNESCO (2016).

Sometimes an NQF can facilitate credit recognition

Individual vocational institutions can establish bilateral agreements with other education institutions, with rights of access and credit recognition for their graduates. While these bilateral arrangements are common, they consume much administrative energy. Sometimes a national or regional system can facilitate pathways. For example, in Japan a credit transfer programme encourages universities and junior colleges to exchange credits with professional training colleges (Sawano, 2015). In Colombia, the city of Bogota has set up agreements to ensure that all HEIs that participate in partnerships with secondary schools have their credits recognized by other institutions, not just the one delivering the training (OECD, 2016a). In England, the Skills for Sustainable Communities Lifelong Learning Network established 361 progression agreements, mostly between vocational further education colleges and HEIs (McKee, n.d.). But such 'frameworks' also depend on commitment from the participant institutions. In Israel, although universities may grant credit

for prior vocational qualifications under a national protocol, in practice many universities are reluctant to do so (Musset et al., 2014).

Practical tools are needed to identify common elements in curricula

Practical tools are needed to clarify for the participant institutions what a student has already learned in a common format. For example, the US state of Florida's course numbering system aims to make post-secondary programmes comparable across institutions to create pathways across degrees and levels. It attributes the same 'number' to courses that have the same content and are taught by teachers with comparable credentials. So, regardless of the institutions providing them, similar courses are considered equivalent and provide the same credits. The system covers all public post-secondary institutions, but few private providers, which makes it hard for students in private institutions to transfer to public ones. But despite the existence of the system, few students are aware of the possibility to transfer: 79 per cent of academic associate degree students said that they did not understand the articulation policy (Kuczera and Field, 2013).

Box 7: Recognition of prior learning (RPL)

In **France**, a 2002 law establishes an individual right to the recognition of professional experience (validation des acquis de l'expérience, VAE) in the acquisition of an academic qualification. This allows an individual to get part or all the qualification, based on professional experience, validated by an academic panel in the case of a higher education qualification. The candidate prepares an application documenting their relevant professional experience, which is then examined by a panel including both academic and professional members. The panel may then either grant the full qualification, or alternatively set out the courses that need to be followed by the candidate to complete the qualification. The qualification obtained is the same as can be obtained through academic study.

For more details see Chaparro, 2012.

Mauritius implemented an RPL system in 2009. It follows the qualifications set up in its NQF and has been widely accepted by all stakeholders, so that RPL has been progressively extended to a larger range of sectors. First, the application for RPL is pre-screened. Then, if the pre-screening is successful, an RPL facilitator is assigned to the candidate and helps them build a portfolio, which collects the candidate's employment history, evidence of skills, and any relevant experience, within a period of three months. The portfolio can include formal education results, samples of work produced, performance appraisal reports and references, photographs of work activities and written testimonials. After submission of the portfolio, an assessment against a selected qualification is carried out through an interview. If the applicant meets the standards, the assessment leads to the delivery of a full or partial qualification. In Mauritius, RPL thus serves as a bridge and feeder to post-secondary education.

For more details see Singh and Duvekot, 2013.

The University of the Western Cape, in **South Africa**, provides RPL services to thousands of students. There are two ways for candidates to apply for admission to the university through RPL. First, the portfolio development course is a sixteen-week programme in which students attend lectures, write assignments and document their learning history to produce a portfolio that will be assessed in the application process. The course also prepares students for interviews and includes mentoring support. Second, Tests for Access and Placement includes two different tests: the first one assesses applicants' motivation and level of prior learning, while the second (the National Benchmark Test) evaluates their potential to cope with the level of academic skills, writing and numeracy that are needed in higher education.

For more details see <https://www.uwc.ac.za/Students/DLL/Pages/RPL-for-Access-to-Undergraduate-Study.aspx>

Recognition of prior learning (RPL) can help those with practical skills to enter post-secondary education

RPL (also known as validation, or accreditation of prior learning) is a process that assesses individuals' formal, non-formal and informal learning (often gained

through professional or personal experience) (MacKenzie and Polvere, 2009). It can therefore be used to grant credit for practical vocational skills and work experience, which can then help with access and course exemptions (Singh and Duvekot, 2013). RPL is also a powerful tool for integrating immigrants, by making their qualifications and skills recognized and valued in the receiving country, thus allowing them to integrate into the local job market or education system (see Box 7). But RPL is also implicit in occupational and professional examinations which do not require programmes of learning. These include parallel arrangements which allow those who have informally acquired the same skills as graduates of formal apprenticeship systems to have their skills certified with the same qualification. Such arrangements are extremely important in the many developing countries where informality in the labour market, and in skills development, is a salient feature, as in Kenya (see Box 8).

The UNESCO Institute for Lifelong Learning defines a broader notion, encompassing RPL

UNESCO Institute for Lifelong Learning (UNESCO-UIL) (2012) defines 'Recognition, Validation and Accreditation of Learning Outcomes' as:

A practice that makes visible and values the full range of competencies (knowledge, skills and attitudes) that individuals have obtained in various contexts, and through various means in different phases of their lives:

- **Recognition** is a process of granting official status to learning outcomes and/or competencies, which can lead to the acknowledgement of their value in society;
- **Validation** is the confirmation by an officially approved body that learning outcomes or competencies acquired by an individual have been assessed against reference points or standards through pre-defined assessment methodologies;
- **Accreditation** is a process by which an officially approved body, on the basis of assessment of learning outcomes and/or competencies according to different purposes and methods, awards qualifications (certificates, diplomas or titles), or grants equivalences, credit units or exemptions, or issues documents such as portfolios of competencies.

Box 8: Using RPL to certify informal apprenticeships in Kenya

In Kenya, alongside formal apprenticeships, there are a very large number of informal apprenticeships. Formal apprenticeships are pursued after secondary education, and are managed under the National Industrial Training Authority (NITA), taking three years to complete. The trainees are recruited by employers who register them for the programme. On-the-job training is supplemented by six weeks of practical and theoretical training in NITA institutions every year. Funding is drawn from a training levy on employers.

Informal apprenticeship takes place both in formal and informal enterprises. In the informal sector a training system based on the apprenticeship model is thriving. Informal apprenticeship in Kenya has no rigid rules, time constraints, fixed fee structure or certification requirement. The trade testing system, provided by NITA, allows those who have acquired their skills through informal apprenticeship to have their skills certified at one of three levels. In 2015 there were more than 45,000 trade test passes.

Source: UNESCO (2018e).

A common currency of learning outcomes can facilitate transparency

Transparency mechanisms – including NQFs, mechanisms to recognize prior learning, and arrangements to give credit for previous coursework – require a ‘common currency’ of learning outcomes in terms of which different programmes can be compared (see Cedefop, 2017). Thus, for example, common learning outcomes from a short-cycle post-secondary and a bachelor’s programme support the argument that a graduate of the former should not be required to repeat course material on entry into the latter. This comparison depends on both programmes being described in terms of learning outcomes, rather than in terms of the curricula and programmes of study that lead to those outcomes. Such a description may not only assist transitions, but also assist learners, by clarifying the learning outcome goals of a programme (see for example Cedefop, 2009).

But its application in practice is difficult

While the logic of comparison in terms of learning outcomes is compelling, application is hard. First, quality assurance is necessary, so that learning outcomes are not only intended, but also reliably realized. Vocational and academic study may also approach learning outcomes from different points of view, with vocational study emphasizing the capacity to perform a task

successfully and tackle the practical challenges involved, while academic programmes emphasize an understanding of the theoretical principles behind the task. Negotiating these different perspectives in terms of a common currency of learning outcomes is burdensome, although the negotiation itself can usefully bring to the surface differences in learning objectives that have previously been implicit. Finally, some potential learning outcomes – for example the capacity to work in a team – may be very hard to measure and assess, so that some reliance inevitably falls on the previous experience of the individual as a proxy measure of that capacity. This is a step backwards from the idea that we can reliably measure and give credit for learning outcomes. Cedefop (2009) and Allais (2007) draw attention to the limits of attempts to define NQFs (for example) in terms of learning outcomes.

Career guidance for TVET students is critical

TVET graduates sometimes know little about opportunities to pursue further qualifications, and in a TVET institution they are not very likely to learn from teachers or their fellow students about higher education programmes. Career guidance and counselling can help both by informing, and by raising the aspirations of, disadvantaged students (Watts and Fretwell, 2004). For example, ChileCalifica is a Chilean initiative that aims, among other goals, to strengthen the articulation between upper-secondary and post-secondary TVET, to help train higher-level technicians (Santiago Consultores Asociados, 2009).

Such guidance needs support through good data on labour market outcomes

Career guidance requires good data on labour market outcomes, recording the employment status and earnings of those graduating from target post-secondary programmes, and whether the graduate is using the skills that they have acquired during their programme of study. Such information can be collected through 'destinations' surveys of graduates, undertaken some period (perhaps one year) after graduation. In the absence of such information it is impossible to tell whether any programme represents a worthwhile investment for the TVET graduate.

Policy recommendation 1: Promote progression pathways through transparency.

Measure 1.1 Use NQFs to support transitions.

- NQFs should be developed and exploited, as a means of making TVET qualifications clearer to other stakeholders, and thereby supporting the transitions of TVET graduates. This means establishing a credible and transparent methodology for allocating qualifications to levels in the NQF, and allowing TVET qualifications to be compared, in terms of level, with general educational qualifications.

Measure 1.2 Support credit recognition agreements linked to learning outcomes.

- Support credit recognition agreements at bilateral, regional and national level, thus allowing TVET graduates readier access to programmes of further learning. In support of these objectives, emphasize learning outcomes as a means of comparing different education and training programmes.

Measure 1.3 Develop systems for recognizing prior learning.

- Develop systems for recognizing prior learning, thus allowing individuals who have gained practical skills (formally and informally) to have their skills valued and recognized. This will grant them access to post-secondary education and training programmes, and credit recognition within those programmes. Design these systems, in the interests of equity, so as to ensure access by all those groups who might otherwise miss out on formal education and training.

Measure 1.4 Offer quality career guidance, backed by data on labour market outcomes.

- Offer high-quality career guidance to students, allowing TVET students and graduates to identify options for further learning. In support of that objective, collect and make available good-quality data on the outcomes from different TVET programmes and the returns from post-secondary education programmes.

Challenge 2: Weak bridges to post-secondary education

TVET programmes do not always develop the study skills required for academic learning

Initial TVET faces a dilemma over how much attention to give to core academic skills. Where such skills receive limited attention, progression to higher level programmes will be harder to achieve. In France, only 6 per cent of holders of a professional baccalaureate, and 16 per cent of those with a technological baccalaureate, successfully completed their undergraduate education, compared with about half of those with a general upper-secondary diploma (MENESR-SIES, 2016). In Australia, students coming from TAFE colleges to university reported a big culture shock, reflecting not only the formal work requirements, but also the different cultural codes and modes of study in higher education and TVET. Students who benefited from credit transfer and could directly enter the second year had more difficulties in integrating into higher education (Ambrose et al., 2013).

In post-secondary programmes, potential TVET entrants are sometimes crowded out

In Egypt, while graduates from upper secondary TVET may enter higher education if their results are adequate, transition rates are low compared with students from general secondary education (Álvarez-Galván, 2015b). In Lebanon, while students holding a technical baccalaureate (ISCED 3) are, as in France, able to enrol for degree programmes at university (although only in the field in which they majored), university admissions personnel's attitude towards the technical baccalaureate 'varies from qualified acceptance to outright negativity' (Vlaardingerbroek and Hachem El-Masri, 2008). Even in higher vocational programmes, candidates from academic backgrounds may be favoured. In France, 69 per cent of students registered in the first year of the technological university diploma (DUT) in 2012 were from general rather than vocational upper secondary school (MENESR-SIES, 2016). In Egypt, students entering technical colleges are mostly general upper secondary graduates who have failed to gain admission to university, while graduates from upper secondary TVET are crowded out (Álvarez-Galván, 2015b).

Overcoming the challenge: designing initial TVET to support lifelong learning

All upper secondary programmes should prepare students for future study and civic participation

Independent of the issue of entry into higher education, it is important to ask, in principle, what wider study, and indeed broader education, should be included in upper secondary TVET programmes. Even if young people pursuing a TVET programme with a specific occupational target do not intend to continue into higher education, they will need a wide range of learning skills, and broader education, so that they can continue to learn during their lives and careers, both formally and informally. Such requirements may not involve the level of academic preparation required for higher education, but they go well beyond the task of learning the skills required to perform a target job. In some developing countries many young people have had patchy initial schooling. Kingombe (2011) argues, in the context of Africa, that initial TVET programmes must address the basic educational needs of the most disadvantaged young people.

Box 9: Bridging programmes linking TVET with higher education

In **Estonia**, upper-secondary TVET graduates who earn at least 60 credit points in general subjects can continue to higher education, or can spend an additional year taking general education subjects to prepare for higher education, or for state examinations which can be needed to enter some institutions. However, the additional year option has not been used by many graduates.

For more information see HTM, 2014.

In **Colombia**, some technical and technological institutes offer a preparatory cycle enabling students to progress to a higher-level programme, but in 2011 only 4 per cent of university programmes could be accessed from such cycles. Consequently, very few students transition from technical institutes to universities in Colombia

For more information see OECD, 2016a.

In **Indonesia**, entrance to polytechnic institutes is tied to entrance exams that rely mainly on academic skills, favouring general secondary school graduates rather than vocational graduates. In response, public polytechnics have taken measures to assess TVET graduates based on their achievement at school (OECD and ADB, 2015).

For more information see OECD and ADB, 2015.

In **Latvia**, the shorter (two or three-year) upper secondary TVET programmes need to be supplemented by one additional year of study to gain access to higher education. 15 per cent of students pursued this bridging programme in 2013-14.

For more information see OECD, 2016b.

Diverse bridging programmes also prepare TVET graduates for post-secondary education

While many upper secondary TVET programmes do not allow automatic entry to higher education, additional programmes can be used to prepare students from TVET backgrounds for entry. Such bridging initiatives can be national in scope, or local and specific, taking the form of an individual access programme offered by a university, or a bilateral agreement between a university and a TVET institution. Flexible 'add-on' programmes, or bridging programmes, added on top of a vocationally oriented secondary school education, ensure that students who wish to continue their education can meet the requirements in terms of knowledge and skills (see Box 9). Often, because of institutional autonomy in higher education, and sometimes also in the initial TVET institutions, bilateral arrangements between the institutions are critical (see Box 10).

Box 10: Transition from upper secondary TVET to universities of applied science in the Netherlands

In the Netherlands, many students from upper secondary vocational education (MBO) progress directly into degree programmes in universities of applied science (HBO), which are HEIs. Smoothing this pathway is an explicit objective of the Dutch government. But institutions in both sectors have a great deal of autonomy, so cooperation between individual institutions is an extremely important aspect of the challenge.

A recent study identified, in fourteen MBO and HBO institutions, initiatives aimed at improving the transition from MBO to HBO, and particularly to ensure stronger preparation of the students in upper secondary VET (MBO), recognizing that many students lack some of the more academic skills required to succeed in higher education. The measures included providing extra lessons, or additional projects in either the MBO or the HBO institution during the MBO programme, extra lessons and projects of other sorts within the MBO programme, and other kinds of institutional cooperation.

Source: UNESCO (2018f)

In 2017 a pilot study was launched in three universities of applied sciences, establishing a six-month bridging programme to improve the transition between vocational upper secondary schools and degree programmes training teachers for primary education. This addresses a shortage of teachers, as well as making the training programme more socially inclusive.

For more information on this programme see Den Haag Hogescholen (2016).

Some access programmes are offered by universities

Special programmes can help adults who do not have the necessary qualifications to access higher education. In the United Kingdom, Access to Higher Education Diplomas, specialized in a field of study, are common (Crock et al., 2013). The Monash South Africa University offers a one-year foundation programme to students who do not meet the requirements for direct entry to a bachelor programme. Students choose from law, social science, business and economics, information technology, science and health sciences, depending on the BA programme they want to enter. Students also benefit from a mentoring programme in which former top-performing students in the foundation programme are trained to offer academic and social support to current students. Students are tracked in terms of attendance and academic progress to tailor interventions to the needs of each student. However, completing this programme does not guarantee entry to a BA course: they still need to meet grade admissions requirements (Monash University South Africa, 2017).

Box 11: Options for simultaneous study allowing TVET students to access higher education

In Brazil, two types of upper secondary TVET provision combine general and vocational course content. The first one ('integrated') offers academic and vocational courses as one programme in the same secondary school. The second one ('concomitant') allows general upper secondary students to pursue a complementary technical programme at the same time, usually in a separate school.

For more information see Almeida, 2016.

An innovative hybrid programme has been implemented in most vocational schools in Denmark since 2010, to counter the decrease in TVET enrolment. The EUX programme, launched in 2010, interweaves workplace training with general school-based classes, leading students to complete a skilled workers certificate along with the Higher Preparatory Examination granting access to higher education. The programme was expanded to cover twenty-four occupations in 2015. The programme is demanding: in 2014, only 2 per cent of all students in TVET were enrolled in EUX.

For more information see Jorgensen, 2017.

In Switzerland, upper secondary TVET students can opt to pursue a general education qualification (Passerelle maturité professionnelle) which grants access to universities of applied science, in parallel to, or after, their regular upper secondary TVET programme. Twelve per cent of upper secondary TVET graduates now have this qualification and half of the students enrolled in universities of applied sciences come from TVET schools.

For more information see Hoeckel et al., 2009.

Some programmes pursue access to higher education at the same time as a TVET programme

'Hybrid' tracks in upper secondary education allow students to pursue a TVET certificate and a general education diploma simultaneously, thus permitting entrance to HEIs (see Box 11). 'Dual enrolment' in the USA allows secondary school students to accelerate their transition to higher education by taking advanced courses that grant them 'dual' credits for both high school and college. A study in Texas suggests that such opportunities increase the likelihood of students enrolling and completing some form of post-secondary qualification (Struhl and Vargas, 2012). An alternative model is to offer programmes and institutions that straddle the sometimes rather artificial divide between upper secondary and post-secondary vocational programmes. In Austria for example, the vocational colleges offer five-year programmes that cross this boundary, with graduates of the programmes able to (sometimes) negotiate exemptions so that they can then start a bachelor's programme in the second year (Musset et al., 2013). In Japan, the high-status KOSEN institutions offer a similar model (see Box 12).

Box 12: KOSEN colleges in Japan

About 1 per cent of Japanese young people, at around the age of 15, enter one of 57 KOSEN colleges of technology. The KOSEN colleges, providing engineering and technical education, were founded in 1962 to meet technical skills needs at a time of exceptionally rapid economic growth. KOSEN colleges provide five-year programmes combining upper secondary and junior college education. Graduates are able to transfer to the third year of university engineering/science courses by taking transfer examinations or on the basis of recommendations. KOSEN colleges also offer two-year advanced courses to graduates of three-year programmes.

More than half the KOSEN graduates obtain employment immediately, while about a quarter proceed to universities and 15 per cent of students continue their studies in the KOSEN colleges to obtain a bachelor's degree. Two Universities of Technology (Nagaoka and Toyohashi) were especially founded to provide higher education programmes to graduates of KOSEN. KOSEN graduates transfer to the third year of undergraduate programmes in these universities, and 80 per cent of the upper-division student body in both universities are transferred KOSEN students. KOSEN graduates represent 10 per cent of all graduates of engineering departments of all post-secondary institutions.

Source: UNESCO (2018d).

Policy recommendation 2: Design initial TVET to support lifelong learning, and augment it with bridges to more advanced programmes.

Measure 2.1 Build into initial TVET programmes a sufficient range of general knowledge and skills to support lifelong learning.

- Ensure that initial TVET prepares young people not only for a first job, but also for further learning. To this end, build transferable skills, including study skills, literacy, numeracy and digital skills, into vocational programmes and qualifications, equipping graduates with the skills needed to learn throughout their life, formally and informally, and supporting access to post-secondary education.

Measure 2.2 Provide optional bridging programmes for TVET students allowing them to access post-secondary education.

- Provide optional bridging programmes to initial TVET students, either during or after their TVET programmes, allowing them to gain access to programmes of further learning, including higher education, and to succeed in those programmes. The programmes may offer study skills, basic skills of numeracy and literacy, and targeted preparation in given fields of study.

Challenge 3: Gaps and barriers in post-secondary provision

Higher education institutions may not always see attractions in strengthened pathways

Effective pathways depend on engagement and support not only from the world of TVET, but also from that of higher education. But while strengthened pathways from TVET to higher education would benefit TVET by enhancing its status, the benefits to HEIs are less clear. From the perspective of higher education, those with TVET backgrounds could be perceived as unwelcome

entrants, partly because a TVET programme may have prepared them inadequately for more academic demands, and partly because earlier selection may have diverted less able students to TVET, so that TVET has come to 'signal' low ability.

Cost can be a major deterrent to further study

At post-secondary level, finance can be a barrier to study, given tuition fees and maintenance costs for students who live away from home. The level and shape of government support to students, in the form of subsidized tuition, grants and loans, is highly variable. These challenges are widely recognized, not least as financial barriers contribute to a narrowing of participation, as those from less affluent backgrounds are deterred from further study by the cost. Some major policy dilemmas are involved. Subsidizing all students who pursue post-secondary education may open these pathways to students from less affluent backgrounds, but general subsidies for higher education channel large amounts of public resources to the more advantaged segment of the population.

Many universities remain organized around young full-time students

Often higher education entrants are numerically dominated by school-leavers, so the situation of adult students, who often need to juggle study with work and home responsibilities, can be overlooked. Adults often have to cope with lack of time, family responsibilities and incompatible scheduling of courses, as well as tuition costs (Kazis et al., 2007). This barrier does not only affect students with a TVET background, but it is an issue of key importance for adults wishing to enter some form of post-secondary education or training, including higher education.

Overcoming the challenge: removing the obstacles and filling the gaps in post-secondary provision

There are advantages for higher education in encouraging entrants from TVET backgrounds

Some factors may encourage HEIs to be more open to TVET entrants. First, the desire to expand their potential market may encourage a search for talent that is not signalled through traditional academic qualifications. HEIs may also be active in domains that are technical and professional, blurring the boundaries between the traditionally academic orientation of higher education and 'vocational' programmes. In for-profit HEIs, and some parts of the public sector, competitive pressures spur institutions to open their doors to TVET graduates as a new source of business.

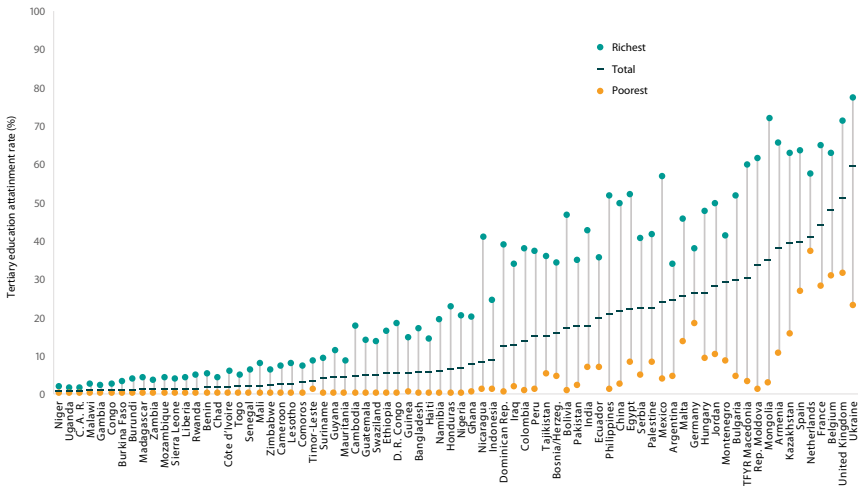
Pressure from employers can also make a difference

HEIs and other post-secondary institutions often enjoy extensive institutional autonomy. But depending on governance arrangements, employers, and more broadly, labour market factors, can encourage post-secondary institutions to address labour market needs in their provision, as well as student demand. In Austria, for example, universities of applied science cannot start new programmes without making a systematic survey of potential labour market demand for the skills involved (Musset et al., 2013). Such governance arrangements do not automatically open the doors to entrants from initial TVET, but they do tend to encourage a focus on the kinds of workplace skills in which employers are interested, and therefore provide a frame for a positive approach to the recognition of practical skills, as well as academic excellence. Universities have always sought to nurture the brightest and most innovative individuals, and draw their strength from the concentration of excellence. But excellence is multi-dimensional, and includes the practical skills of the craftsman alongside those of more abstract intellectual pursuits. For universities, broadening their criteria for entry may allow them to benefit from a more diverse field of excellence.

Policy-makers are looking to higher education to promote social mobility

In the past, it was often expected that rising participation in higher education would be a source of equity and social mobility, as it would allow able young people from humble backgrounds to realize their full potential. Often the evidence has disappointed. Instead, most countries in both the developing and developed worlds have reported large disparities in higher education participation between the rich and the poor, suggesting that very often higher education is serving as a means for the well-off to pass on their advantages to their children, rather than the hoped-for vehicle of social mobility (see Figure 2). Even when entrance to higher education is based on objective tests of performance rather than the capacity to pay, wealthier families have multiple tools to advantage their offspring throughout their initial schooling, ranging from residing in the (often more expensive) catchment area of a good school to private tutoring.

Figure 2: Percentage of 25-29-year-olds who have completed at least four years of tertiary education, by wealth, selected countries, 2008-2014



Source: UNESCO (2017).

Widening participation in higher education may assist both social mobility and entrance from TVET

In response to this profound challenge, some countries are making strenuous efforts in the public education system to widen participation to compensate for the weaker preparation of potential entrants from less-favoured backgrounds. Such efforts may include different types of support and access programmes, many of which would be suitable for those potential entrants who may come from a TVET programme, and therefore may not have received the more classical academic training of students from more conventional routes in general education. In this way, the broader objective of HEIs to demonstrate that they can be a vehicle of social mobility should, in principle at least, also extend to a more open approach to entrants from a TVET background.

Financial obstacles represent major hurdles for many TVET entrants

Often those from TVET backgrounds returning to education face financial obstacles, partly because they may come from more humble backgrounds, and partly also because adults with TVET backgrounds face additional costs, for example if they need to take time off from a job that supports them and their family. None of these obstacles is specific to those from TVET backgrounds, but they represent a challenge for the group with which this paper is concerned. There is little point in clearing away other obstacles to effective pathways, if potential TVET entrants to post-secondary education cannot afford to pursue the programmes involved.

So access for TVET entrants needs to be underpinned by broader measures

Financial support measures for post-secondary education need to encourage all students to reach their potential, while also serving social equity objectives. Carefully crafted policy measures are required, but their discussion is well outside the scope of this paper. They are examined more fully in UNESCO (2017), which recommends a combination of tuition fees with means-tested grants and loans to concentrate public financial aid on disadvantaged student groups.

Shorter post-secondary vocational programmes are common in some countries, and play a useful role

As described earlier, shorter post-secondary vocational programmes play a major role in the skills systems of some countries but not others. Typically, they prepare students for a range of technical and professional occupations requiring more than upper secondary education, but less than a full bachelor's level programme occupying three or four years. Such programmes can play a very important role in the overall architecture of TVET pathways. First, such programmes very often offer a higher-level vocational qualification to which graduates of upper secondary TVET can aspire, commonly supporting a deepening or broadening of a technical or professional skill, and in this way, demonstrating that upper secondary TVET is not a dead end, regardless of the higher education possibilities. In this case they are an alternative to higher education. Second, they can offer a route to higher education, by offering the possibility of transition to a bachelor's programme in a university, with credit recognition. In India, the polytechnic institutions serve this function, with some women-only institutions encouraging women to develop skills in technical fields (see Box 13). For all these reasons, such programmes can be very valuable. In some countries, such programmes are squeezed between two powerful sets of institutions, schools and universities, and find it difficult to obtain traction, or grow to scale, despite the obvious common-sense observation that post-secondary labour market skills do not automatically come in bachelor's-degree-sized chunks, requiring three or four years of study. So these programmes may need support.

Box 13: Polytechnics, institutes of technology and their programmes in India

In India 'polytechnics', 'institutes of technology' and other 'colleges of engineering', usually under the auspices of the All India Council for Technical Education (AICTE), offer three-year diploma courses. Historically their work was focused in the engineering area, but in recent decades many polytechnics have also offered courses in other disciplines, although still mostly technical, as in electronics and computer science. The intention is that graduates can provide mid-level engineering skills, between technicians and engineers. In the context of engineering programmes where women are under-represented in almost all countries, a number of the polytechnic institutions are for women only.

For more information on India's polytechnics and institutes of technology see www.aicte-india.org

The three-year diploma programmes are intended for students after school year 10 (typically aged 16). Polytechnics also offer post-diploma and advanced diploma programmes of one or two years' duration in different specializations. As the polytechnics fall under the same ministerial responsibility as higher education, credit recognition and progression to university programmes, in engineering at least, is facilitated.

Source: Adapted from UNESCO (2018c).

Flexible time schedules can be helpful

Post-secondary institutions can cater to the needs of the growing adult learner population by providing them with opportunities for part-time, modular or evening courses – i.e. non-traditional time schedules. Japan has implemented reforms to open access to HEIs to adult learners, but with limited success. In 1991, a 'daytime and evening course system' was implemented in universities and junior colleges, allowing adult students to take occasional classes in the daytime on weekdays and to focus on their studies in the evening and on Saturdays (Sawano, 2015). In 2002, a 'long-term enrolment system' was introduced to allow adult students to take degree courses over a longer period than usual. In 2009, 281 universities had introduced this system, but only 2,444 students were using it, most of them in graduate school. One obstacle is that courses still emphasize the quantity of learning, such as the time spent studying each day, which makes it difficult for working adults to participate (Sawano, 2015). Consequently, even though almost 90 per cent of adult workers say they are interested in taking part in education, 72 per cent think that they are too busy with work, or that the cost is too high (Sawano, 2015).

Box 14: The Open University of China (OUC)

This university welcomes over 3.5 million students (the second biggest open university in the world), and maintains a 'lenient entry, stringent exit' policy. To ensure that students are on track, interviews and counselling sessions throughout the programmes are compulsory, so that students who are not engaged can withdraw from their studies. The university created a Credit Bank, which can transfer credits for students' accomplishments and allows them to bridge and connect various learning achievements across programmes, thus linking degree and non-degree education (both offered by the OUC). To that end, each student has a lifelong learning portfolio in which they can accumulate credits, allowing them to apply for certificates when they have enough credits.

For more information see Ally and Bainbridge, 2015.

Online education is expanding rapidly

'Open' universities were originally established to allow those without the usual entrance qualifications to obtain a higher education degree. This approach was often linked to distance learning, and an emphasis on self-directed learning. Open universities have become increasingly popular over the past decades, partly thanks to the development of online distance learning technologies and with the expansion of massive online open courses (MOOCs), of which there were 4,200 in 2015 (Sava and Shah, 2015; Ally and Bainbridge, 2015). MOOCs are provided to an unlimited number of students, free of charge, require no entry qualifications, and are fully online. However, most of the MOOCs currently provided are delivered by big MOOC providers based in the USA, and 75 per cent are in English (Patru and Balaji, 2016). The African Virtual University (AVU), which started as a World Bank project in 1977 and later developed autonomously as a pan-African inter-governmental organization, provides tuition-free online programmes and courses in English, French and Portuguese. Sometimes those taking advantage of this type of programme are already well educated – in other words they have the capacity for self-directed learning. Adults with a TVET or practical background, who are therefore unused to academic study, may need some hands-on support and guidance to complement online provision, and assist their further learning. China's open university provides an interesting model (see Box 14).

Policy recommendation 3: Remove the obstacles and fill the gaps in post-secondary provision.

Measure 3.1 Widen participation in post-secondary education, thus allowing more access for TVET graduates.

- To support the pathway from TVET into higher education, and to serve the interests of social mobility, excellence and diversity in higher education, encourage HEIs and other post-secondary institutions to broaden their entrance criteria to give full recognition to TVET and practitioner competencies alongside academic skills. Underpin access measures for TVET entrants by funding arrangements that concentrate public financial aid on disadvantaged student groups.

Measure 3.2 Develop shorter post-secondary vocational programmes.

- Ensure that, alongside bachelor-level programmes in HEIs, there is an adequate offer of shorter post-secondary vocational programmes of between a few months to two years if studied full-time. Such programmes help to meet the need for mid-level technical and professional qualifications, and provide a natural avenue of progression for graduates of initial TVET.

Measure 3.3 Meet the needs of adults.

- To suit the needs of adult students, institutions should allow for flexibility in time scheduling, and make full use of modern ICT.

PART V: Implementing measures to secure pathways: taking account of country circumstances

Policy implementation and development needs to take careful account of country circumstances

This publication has articulated some broad policy guidelines. In practice, the measures needed will have to be tailored carefully to the circumstances of each individual country, fully recognizing the enormous diversity of UNESCO Member States, and very large differences in economic circumstances, labour markets, and education and training systems. Countries will engage with the pathways agenda with different priorities in mind. Some countries might be concerned about a lack of STEM skills at post-secondary level to meet new labour market demands; some might wish to address the low skills of many adults. Some might wish to tackle regional or social inequities by upskilling those who are least skilled. In practice, this is likely to mean that, depending on the country circumstances, some elements of these guidelines become priorities, while others become less important. Some examples of how context matters are given below. These are just examples, and every country is different, but they convey the flavour of how different individual country circumstances, and indeed the policy objectives which lie behind the development of pathways, may affect the required policy mix.

- When countries have highly fragmented skills systems, with different parts of the education and training system managed by different parts of government, or divided between local and central government, and sometimes also with a large private sector, the priority will often be measures to create coherence and transparency that will support pathways from TVET to post-secondary education and training. The development of overarching NQFs, linked to a systematic focus on

learning outcomes, and backed by good data and career guidance, is very important.

- Some developing countries have large informal economies, and many adult workers will have acquired workplace skills of different types that are uncertified, while also often having gaps in their formal education. In this case the emphasis may fall on mechanisms such as RPL, certifying existing skills while also engaging those concerned with further learning, leading to qualifications that enhance their life chances. Given that many of these adults may be highly disadvantaged, effective access measures will be needed to overcome a mix of practical, financial and other barriers to further learning.
- Many countries face challenges over the school-to-work transition, and experience significant levels of drop-out from school, leaving substantial proportions of the young population not in education, training or work (NEET). Often this calls for a redesign of school education, to retain the engagement of those young people who are less keen on classroom academic settings. This often means vocational programmes with a focus on practical and workplace experience, but these must not be a dead-end tracks. Vocational programmes designed for young people at risk therefore also need to retain the core academic skills that will support lifelong learning. In designing policies to address the needs of young people at risk, the bridge to lifelong learning will be part of the policy package required.
- In some countries, major weaknesses in initial TVET should be addressed as a first priority, since it may be fruitless to try to seek transitions to more demanding and higher-level programmes for those who have been inadequately prepared. Once the foundation of quality is established, pathways to further learning can be developed.

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Until recently, few graduates of technical and vocational education and training (TVET) aspired to further learning, particularly higher education. But higher-level qualifications are now a common expectation among young people, reflecting increased ambitions, labour market demand for higher-level skills, and a need to upskill and reskill throughout life. Clear and flexible learning pathways are necessary to ensure that young people have the necessary skills to enter the labour market; they are also essential to keep the skills of the workforce up to date and adapted to the changing economic conditions and opportunities that will facilitate the transition to sustainable economies and societies. The emergence of new occupations and the rapid transformation of existing ones, the explosion in knowledge and technology, the shift to an information and knowledge-based society, new ways of organizing the workplace in an increasingly integrated economy are some of the reasons why establishing learning pathways in a lifelong learning perspective are an imperative today.

This publication examines the drivers behind recent developments in improving the articulations between TVET and post-secondary, including higher, education, the challenges and obstacles to establishing effective learning pathways and the measures and good practices adopted by different countries to address them. Drawing on the available literature, including a number of in-depth country case studies, it makes recommendations on how effective learning pathways can be developed in different country contexts. A set of policy guidelines to assist policy-makers interested in improving the articulation of and pathways between TVET and post-secondary education and developing more effective pathways between the two is published separately.

