OECD Reviews of Vocational Education and Training

Building Future-Ready Vocational Education and Training Systems

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BETTER POLICIES FOR BETTER LIVES

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Foreword

Under the impulse of mega-trends, such as automation, digitalisation, population ageing and the green transition, the skill needs in the labour markets of OECD countries are undergoing substantial change, reinforcing the need for high-quality training opportunities. Education and training will need to be aligned with labour market needs to ensure that relevant skills are developed and enable individuals to navigate changing labour markets. Moreover, these training opportunities need to be accessible to a diverse group of learners, including adults in need of up-skilling and re-skilling. Future-ready education and training systems do not only adapt to these changes, but also have a key role to play in fostering change. Innovations in teaching and learning technologies and pedagogical approaches can contribute to reforming and modernising education and training systems around the world.

Vocation Education and Training (VET) plays a key role in the education and training systems of many OECD countries. Well-designed VET systems contribute to engaging students in education, facilitate school-to-work transitions and provide opportunities for adults to invest in relevant skills during working life. A changing world of work brings the importance of VET to the forefront, as it has the ability to develop the skills that are needed in today's labour markets and societies. At the same time, structural changes highlight the need to re-engineer certain parts of VET systems in some countries to ensure they can make the most of the opportunities ongoing changes present.

This report looks a set of opportunities and challenges for VET systems to be future-ready, with a focus on responsiveness, flexibility, supporting transitions, and innovation. The report is part of the OECD Centre for Skills' broader work on *Facing the Future* in VET, which supports countries in building strong and resilient VET systems. It builds on earlier work carried out by the OECD Centre for Skills, including country reviews and thematic work on VET teachers and professional tertiary education, as well as related work carried out in other parts of the OECD.

This report was drafted by Ivan Bornacelly, Shinyoung Jeon, Viktoria Kis, Malgorzata Kuczera and Rodrigo Torres from the OECD Centre for Skills, under the supervision of Marieke Vandeweyer (manager of the VET team) and El Iza Mohamedou (Head of the OECD Centre for Skills). The report has benefited from comments provided by Mark Pearson (Deputy-Director for Employment, Labour and Social Affairs), colleagues from the Directorate for Education and Skills, and the members of Group of National Experts on VET. Administrative and editorial assistance was provided by Jennifer Cannon and Duniya Dedeyn from the OECD Centre for Skills.

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Acronyms and abbreviations

The following are the main abbreviations and acronyms cited in the report.

Abbreviation/acronym	Full description
AI	Artificial intelligence
CTE	Career technical education
EU	European Union
I(C)T	Information (and communication) technology
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ITET	Initial teacher education and training
PES	Public Employment Services
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PD	Professional development
RPL	Recognition of prior learning
SME	Small and medium-size enterprise
TALIS	Teaching And Learning International Survey
VET	Vocational education and training
VR/AR	Virtual reality/Augmented reality
WBL	Work-based learning

Executive summary

Labour markets and societies are undergoing profound changes, due to structural factors such as the green and digital transition. These changes have implications for skill needs, and vocational education and training (VET) can play a key role in ensuring that young people and adults have the skills that societies and labour markets require today, but also for the (near) future. At the same time, VET can equip people with the transversal skills needed to be responsive to change. Sitting at the intersection between the education system and the labour market, VET is well placed to respond to changing skill needs. It is a major part of education systems around the world, enrolling a large proportion of learners at various levels of education.

Nonetheless, VET systems may require re-engineering on various fronts to achieve their full potential in today's evolving context. Firstly, VET will need to stay relevant to changing skill needs in labour markets and societies. This will require aligning the supply and content of programmes with employer requirements, but also giving sufficient opportunities for learners to develop the transversal skills needed to be adaptable. Often still, VET enrolment is concentrated in a fairly narrow set of fields, and VET programmes focus on preparing learners for specific occupations with limited attention to transversal skills. Secondly, VET needs to be a vehicle for lifelong learning, both in terms of offering programmes that are accessible and relevant for adult learners and in terms of providing effective pathways for learning after VET. Today, in most countries VET caters mostly to young learners and is often perceived as preparing for the labour market and not for further learning. A re-engineered VET system should be underpinned by solid career guidance efforts that help young people and adults navigate change and find their way into VET. It should also be coupled with efforts to make the VET system inclusive, so that it is an attractive and accessible option for learners from various backgrounds and with different needs and aspirations. These re-engineering efforts could be supported by increased technology use in VET, which has the potential to make VET more accessible, attractive, effective and efficient.

This report looks at different elements of future-ready VET systems, focussing on responsiveness, flexibility and inclusion, supporting transitions, and innovation:

- Creating responsive VET systems: To ensure that VET programmes remain relevant for students and employers in a changing world of work, they need to be aligned with labour market needs. VET programmes could be provided at various levels of education, including at the tertiary level, and in a variety of fields. Higher-level VET programmes are receiving increasing attention in light of the growing demand for advanced technical skills. The use of high-quality information on skill needs, based on a range of data sources and stakeholder inputs, is crucial in the design of responsive VET systems. Moreover, strong engagement with social partners in the different phases of VET policy can contribute to ensuring that relevant and up-to-date programmes are provided. Information on skill needs should also be used to inform skills development opportunities for VET teachers.
- Making VET more inclusive through increased flexibility: VET can play an important role in providing training opportunities to a broad audience. Therefore, sufficient flexibility is needed to ensure that students with different personal characteristics, needs and aspirations can have access

to VET programmes that are tailored to their needs. For instance, learners who are at risk of dropping out of education or those who have basic skills gaps would benefit from additional guidance and support or tailored VET programmes. In light of changing skill needs, VET can foster lifelong learning by providing accessible and relevant opportunities for up-skilling and re-skilling to adults. Modularisation and microcredentials, coupled with mechanisms that allow for the recognition of prior learning, are ways to make VET more flexible for adult learners, alongside part-time and online provision.

- Supporting transitions: A changing world of work implies that individuals will need to be able to adapt to change throughout their working lives. Ensuring that initial VET students leave the education system with strong foundational skills will be important to ensure that they can successfully engage in further learning to keep their skills up to date. Striking the right balance between general and vocational content in initial VET is challenging, and countries have adopted different approaches to the degree of specialisation and choice in upper secondary education. Moreover, strong transversal skills and a lifelong learning mindset will help VET graduates be resilient and adaptable. To ensure that individuals can navigate a changing labour market and are able to find VET programmes that suit their needs, solid career guidance is essential.
- Innovating in VET: The use of new teaching and learning methods can support the effective delivery of VET. This includes the use of new technologies, such as simulators and virtual reality, in classrooms and in workplaces, but also the use of innovative pedagogical approaches. Technology can be integrated in various aspects of VET provision and contribute to making the system more accessible, attractive, relevant, transparent, effective and efficient. Such innovation requires strong leadership in VET institutions, well-trained VET teachers, and strong co-ordination with the world of work. Moreover, the adoption of technology can be facilitated by policies that address the high cost of digital tools, improve knowledge about existing VET technologies, and stimulate the development of new tools.

For each of these dimensions, this report presents a set of key questions that policy makers and other VET stakeholders should consider when re-engineering VET to meet the needs of the future world of work. While the report does not aim to come up with one particular answer or solution for these questions -and different VET systems will require different approaches-, it provides an overview of data and evidence that highlight the importance of the questions for the future of VET and describes a large range of policies and practices put in place in OECD countries and beyond to move towards more future-ready VET systems.

1 The need for more future-ready vocational education and training systems

This chapter describes how skill needs are changing due to factors such as the green and digital transition and population ageing, and how the COVID-19 pandemic further impacted labour markets and education systems. The chapter highlights how vocational education and training (VET) can play a key role in adapting to changing skill needs and preparing individuals for the labour markets and societies of the future. Lastly, the chapter describes the key dimensions of future-ready VET systems that are the focus in the remainder of this report.

Structural changes are impacting skill needs in labour markets and societies

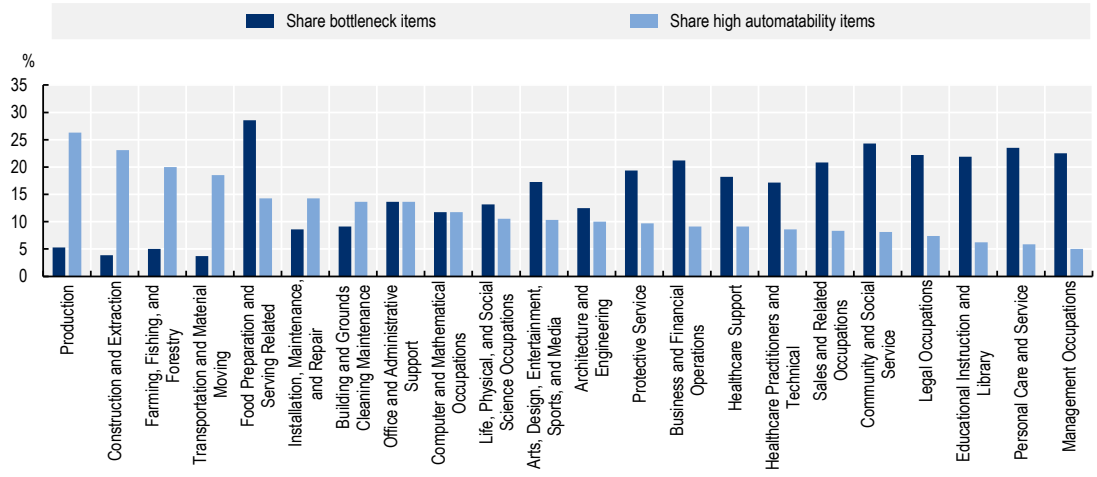
Structural changes in labour markets and societies have changed skill needs. Certain types of jobs no longer exist, new ones have emerged, and continuing roles have changed considerably. As such, some skills have become less in demand and others have seen increased demand, and the way in which certain skills are used and the combination of skills required in various jobs has changed.

One of the structural changes that has impacted labour markets and societies strongly in recent decades and is expected to continue to have an impact is the digital transition. Literature on job polarisation has shown that jobs that are intensive in routine tasks have seen a reduction in their employment share compared to less routine jobs. These jobs were mostly concentrated in the middle of the skills contribution, and as such automation has contributed to what has been referred to as a hollowing out of the occupational structure (Goos, Manning and Salomons, 2014[1]; Goos, Manning and Salomons, 2009[2]; Autor and Dorn, 2013[3]). A 2018 OECD study (Nedelkoska and Quintini, 2018[4]) estimated that 14% of jobs in OECD countries had a high risk of automation -meaning that they could disappear altogether - and an additional 32% could see significant changes in their task composition due to automation. The jobs most like to be impacted by automation were found to be at the lower-end and the middle of the skills distribution.

More recent analysis that takes into account recent advances in artificial intelligence (AI) shows that the set of skills and abilities that can be replicated by automation technologies has broadened (Lassébie and Quintini, 2022[5]). It finds that some skills and abilities previously identified as bottlenecks to automation are now more susceptible to automation, like for example the knowledge of fine arts, several psychomotor abilities (the ability to work in cramped workspace and awkward positions, finger dexterity, and manual dexterity), reading comprehension, deductive and inductive reasoning skills, fluency of ideas and scheduling skills. However, there remains significant bottlenecks to automation. In particular, skills related to complex problem-solving, high-level management and social interaction can hardly be automated given the current state of technological developments. As these bottleneck skills are most strongly concentrated in high-skill jobs (Figure 1.1), the occupations at highest risk of automation remain essentially low-skilled - even if AI increasingly allows automating certain skills and abilities required in high-skilled occupations. However, also certain occupations that are typically classified as low- or middle-skill have a large share of bottleneck skills, e.g. personal care, service, sales.

Figure 1.1. Shares of bottleneck and highly automatable skills and abilities, by occupation

Percentage of the most important skills and abilities, by occupation

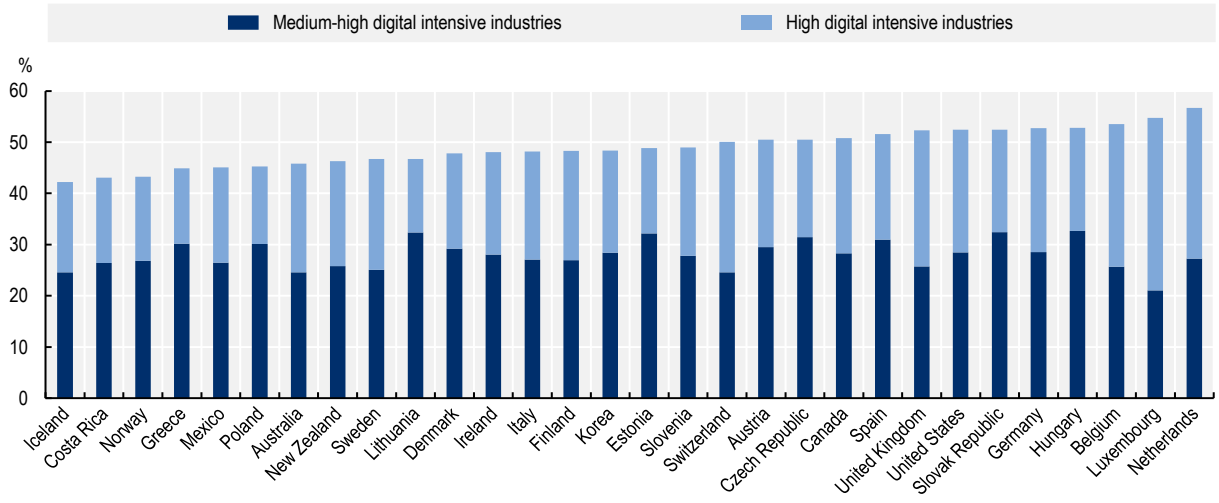


Note: Share of bottleneck and highly automatable items among important items by occupation (SOC 2 digits), where important items are skills and abilities with importance values strictly higher than three. See Lassébie and Quintini (2022[5]) for details.
Source: OECD calculations based on OECD Expert Survey on Skills and Abilities Automatability and O*NET.

At the same time, digitalisation also leads to job creation. In fact, evidence suggests that job creation has exceeded job destruction (Autor and Salomons, 2018[6]). However, the jobs that are being created have a very different profile from the jobs that disappear due to automation. Therefore, those who have lost their job are likely to need substantial reskilling to move into these new types of jobs. Across OECD countries on average 49% of jobs are in sectors with medium-high or high levels of digital intensity. This ranges from 42% in Iceland to 57% in the Netherlands (Figure 1.2).

Figure 1.2. Employment in digital intensive industries, 2018

Share of total employment



Note: Digital intensity is defined according to the taxonomy described in Calvino et al. (2018[7]).
Source: The OECD Going Digital Toolkit, based on the OECD Structural Analysis (STAN) Database, http://oe.cd/stan and the OECD Trade in Employment Database, http://oe.cd/io-emp.

Another important trend that is contributing to changing skill needs is the green transition. As societies move to greener consumption and production patterns, this changes the sectoral and occupational composition of the labour market and the skill content within occupations and sectors. For example, jobs in carbon-intensive industries will likely decline as a consequence of those shifts, while new jobs will be created in sectors related to green energy. The skill requirements in both types of sectors are likely very different. Likewise, workers in car maintenance and repair require a different set of skills when working on electric cars than when working on combustion-engine cars. Forthcoming OECD analysis (OECD, forthcoming[8]) estimates that structural transformations needed to meet the EU Fit for 55 policy targets[1] lead to an employment increase of 1.3%, with a decrease in employment for blue collar and farm workers of 3% and an increase for other categories of between 4% and 5%. Many of the skills that are projected to face the strongest increase in demand relate to inter-personal communication and the use of digital technologies, whereas skills related to the use of tools and technologies adopted in traditional manufacturing processes are found on the other end of the spectrum.

These structural changes put the importance of lifelong learning at the forefront. This is reinforced by the fact that populations are ageing and staying longer in the labour market. Indeed, the old-age dependency ratio (i.e. the number of individuals aged 65 and over per 100 people of working age - defined as those at ages 20 to 64) has increased to 33% in 2023 across OECD countries (11 percentage points higher than in 2000) and is projected to reach 53% by 2050 (OECD, 2023[9]). Retirement ages have been increased in many OECD countries. In addition to creating a strong need for lifelong learning opportunities, population

ageing also changes the demand for certain goods and services (e.g. related to health and social care) - which in turn impacts skill needs in the labour market.

All of these changes have contributed to skills imbalances around the world. Many employers struggle to find workers with the right skills. For example, across EU countries 61% of firms reported in 2022 that the availability of staff with the right skills is a major obstacle for their investment activities (European Investment Bank, 2023[10]). According to the 2023 Manpower Global Talent Survey 77% of employers worldwide report difficultly in filling roles (ManpowerGroup, 2023[11]). The most in-demand technical skills reported by employers are IT and data, engineering, and sales and marketing. The soft skills reported most in demand are reliability and self-discipline, creativity and originality, and critical thinking and analysis. According to the OECD Skills for Jobs database, shortages of medical knowledge and training and education skills are substantial across the 43 countries included in the database (OECD, 2022[12]). These two areas have been facing large and increasing shortages for the past eight years, pointing towards a structural problem of under-supply.

In light of these continuing changes in skill needs and already prevailing skill shortages, it is of crucial importance that education and training systems adapt in order to ensure that young people and adults have the skills needed to be successful in today's and tomorrow's labour markets and societies. This will require updating initial education and training programmes so that they prepare young people for these new realities, both in terms of equipping them with a set of transversal skills that make them adaptable and resilient in light of changes and in terms of developing the technical or occupation-specific skills that are in demand. Moreover, these changes call for investment in lifelong learning – as individuals will need to continue to invest in their skills also after leaving initial education. Evidence from OECD countries shows that only about four in ten adults participate in training, and that this share is lower among those who may need training the most, like adults with low levels of educational attainment, older adults, and workers in jobs most exposed to automation (OECD, 2019[13]).

The COVID-19 crisis has disrupted education systems and labour markets

The COVID-19 pandemic disrupted societies, labour markets and education systems around the world. It brought several vulnerabilities to the forefront, and highlighted that not all population groups are equally resilient in light of unexpected changes. For example, young people were particularly badly hit by labour market disruptions, as school-to-work transitions were more difficult, they were more strongly concentrated in sectors that were impacted by job loss and less exposed to teleworking opportunities, and the prevalence of temporary work among youth provided less stability for them. In education, all countries faced school closures and resorted to distance learning opportunities, but not all learners had equal access to digital tools to make the most of these distance learning solutions. Certain parts of the education system faced particular challenges, as was the case for VET where distance solutions for practice-oriented learning were not readily available and workplace learning opportunities were reduced (OECD, 2021[14]).

The pandemic and ensuing recovery also accelerated some of the ongoing structural changes discussed above. Digitalisation took an important leap forward, for example through increased teleworking. The pandemic also gave an impulse to the green transition, with many countries highlighting that the recovery from the pandemic should be a green recovery. At the same time, the pandemic (as well as recent geopolitical instabilities) highlighted value chain vulnerabilities that have made countries reflect on their economic structures and the related skill needs.

In education systems as well, the pandemic gave an impetus for change. An increased reliance on online teaching and learning highlighted the role that digital technologies can play in the education system. While there is still a lot to learn about what works and the enabling factors, there is clearly a lot of potential. At the same time, increased use of digital technologies risks exacerbating already existing inequalities in access to (quality) education – as not all learners and schools/providers will have equal access to

technology or to the same quality of digital materials. The recent experiences have also highlighted the importance of investing in the skills of teachers and trainers so that they can make effective use of digital technologies in their practice.

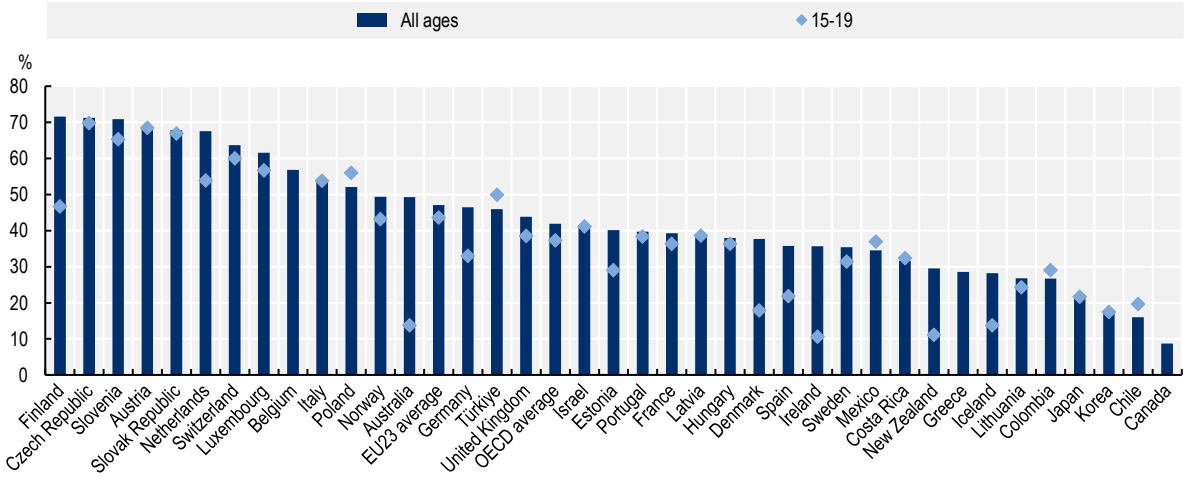
Making the most of VET in times of changing skill needs

In light of the changes presented above, VET could play a key role in ensuring that young people and adults have the skills that societies and labour markets require today, but also in the (near) future. At the same time, VET can equip people with the transversal skills needed to adapt to changing circumstances.

VET plays an important role in education and training systems around the world. Across OECD countries, 42% of learners in upper-secondary education are enrolled in vocational programmes (Figure 1.3). This goes up to 70% in countries like Czech Republic, Finland, and Slovenia. In the majority of countries the shares are slightly lower when focusing on the age group of 15- to 19-year-olds only, as adult learners also enrol in VET. In most countries adult enrolment in upper-secondary VET programmes is limited (as described below and in Chapter 3), but in some countries these programmes mostly cater to older learners as VET is considered mostly as a post-school option (e.g. in Ireland)). Also at the post-secondary level, various countries have a large professionally-oriented sector, including short-cycle tertiary programmes and professional bachelor programmes. Countries with low VET enrolment at the upper-secondary level often have focused their provision of VET at post-secondary levels, like for example in Canada and the United States.

Figure 1.3. Share of learners in upper-secondary education who are enrolled in vocational programmes (2018)

Percentage of all upper secondary education students enrolled in full-time and part-time programmes in public and private institutions



Note: In Italy, upper secondary vocational programmes include post-secondary non-tertiary programmes.
Source: OECD (2020[15]), *Education at a Glance 2020: OECD Indicators*, https://dx.doi.org/10.1787/69096873-en.

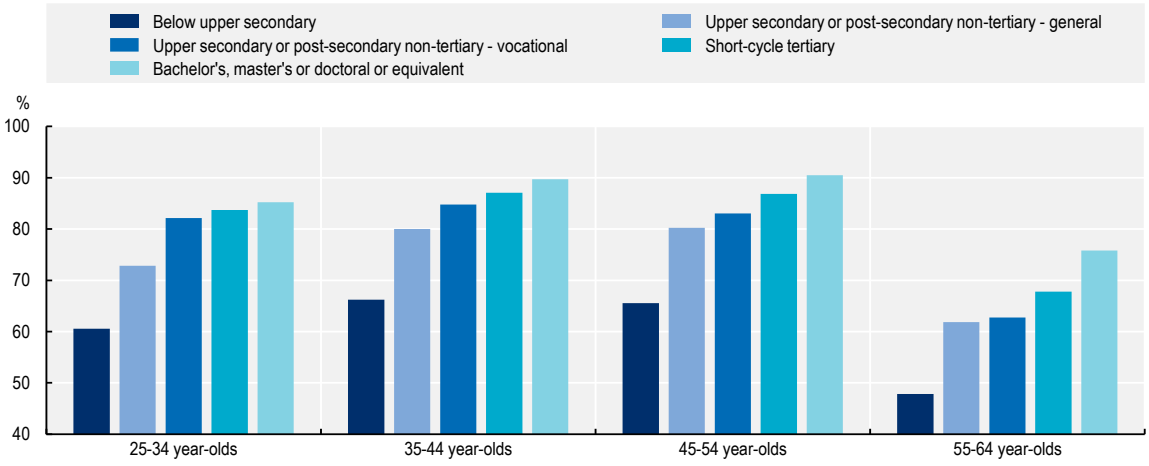
On average, young people with VET qualifications have relatively strong labour market outcomes, especially at the start of their careers (Figure 1.4). Across OECD countries, individuals aged 25 to 34 who have an upper-secondary vocational qualification as their highest qualification have employment rates that

are substantially higher than those with a general qualification at the same level and those without an upper-secondary qualification. Their employment rates are fairly close to those of individuals with higher levels of educational attainment. These average employment rates mask substantial differences between countries. Even within countries there will be differences between graduates from different fields of study and different programme types (e.g. apprenticeship vs. school-based programmes).

The employment rate advantage is smaller for older age groups, but nonetheless remains (Figure 1.4). OECD (2020[16]) confirms this pattern when comparing individuals with similar skill levels and other personal characteristics: the gap in employment rates between those with vocational and general upper-secondary qualifications disappears by age 45, while individuals with VET qualifications maintain their advantage relative to those without upper-secondary education in all age groups. Individuals with tertiary education degrees have higher employment rates than all other education groups at all ages. A similar picture is found for unemployment rates, although here the gap between individuals with vocational and general upper-secondary qualifications already disappears for the 35-44 age group. Similar patterns have been found by Brunello and Rocco (2017[17]), Forster, Bol and van de Werfhorst (2016[18]), Hanushek et al. (2016[19]), and Rözer and Bol (2019[20]).

Figure 1.4. Employment rates, by age group, educational attainment and orientation (2019)

OECD average

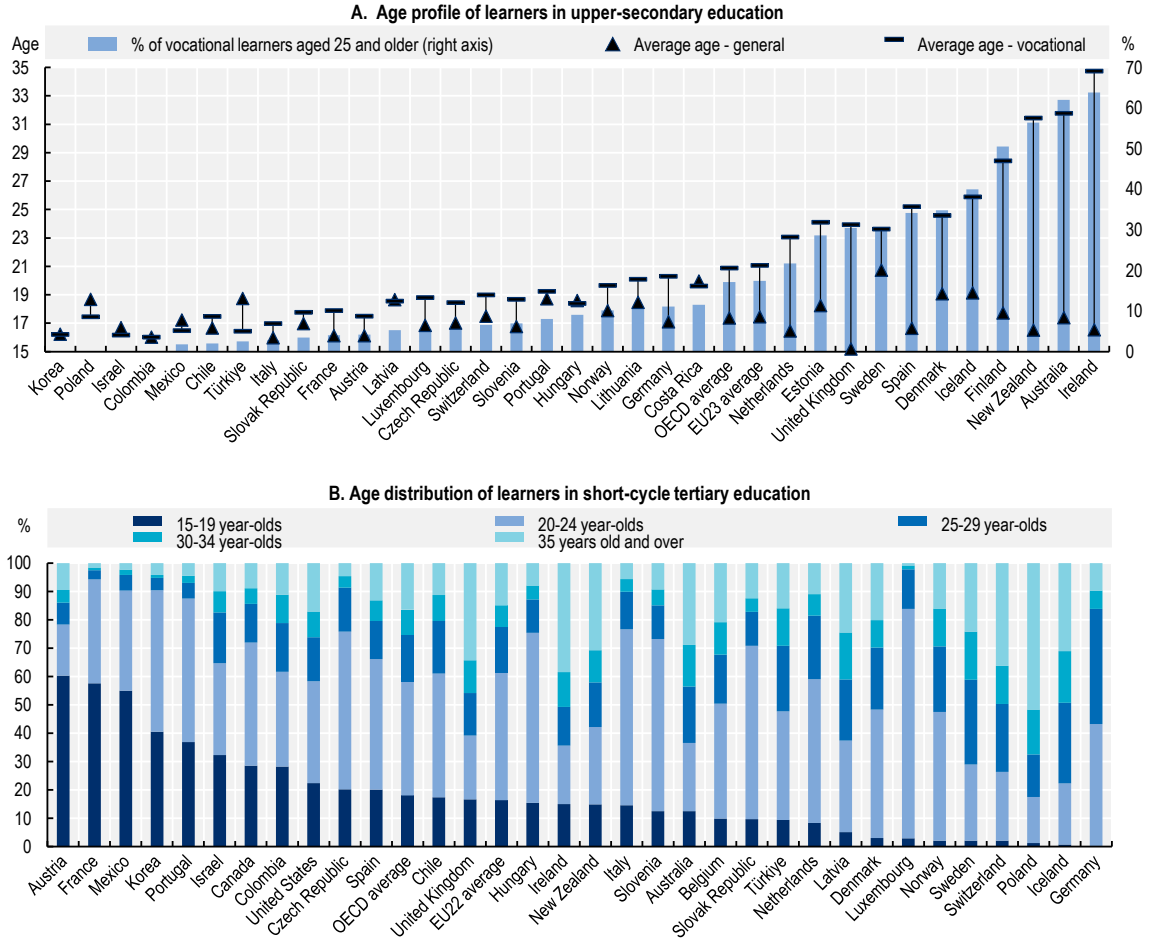


Note: The share of adults with a given educational attainment varies across age groups.
Source: OECD (2020[15]), *Education at a Glance 2020: OECD Indicators*, https://dx.doi.org/10.1787/69096873-en.

As discussed by Rözer and Bol (2019[20]), lower long-run returns to VET could be caused by several mechanisms: i) VET preparing students for employment in manual and craft jobs that have limited potential growth opportunities; ii) VET graduates mostly having job-specific skills rather than transferrable skills; and iii) VET graduates participating less in on-the-job training, making them less flexible in light of structural or technological changes. OECD (2020[16]) finds that the jobs held by young adults with upper-secondary vocational qualifications are relatively strongly exposed to automation, especially when compared to the jobs held by tertiary education graduates. As discussed above, even if recent advancements in AI have meant that certain tasks in high-skill jobs are now also automatable, the largest risks are still found in occupations at lower skill levels – including many occupations typically targeted by VET, such as production, construction and transportation (Figure 1.1). However, various typical VET occupations are also among the occupations that remain difficult to automate, including personal care and service occupations. As such, it is important for VET to be responsive and adapt to changes observed and expected in the labour market, including those caused by automation. Moreover, as labour markets continue to change and certain jobs may disappear or alter significantly, VET needs to prepare individuals to be adaptable.

For individuals to be able to adapt to change once they are in the labour market, they need access to opportunities for upskilling and reskilling. VET could play an essential role in this respect, as it can provide adults with labour market relevant training that leads to widely recognised formal qualifications. Nonetheless, VET systems in most countries predominantly focus on young learners in initial education. While such programmes are often open to older learners, they may not be well aligned with the needs and preferences of this age group. Figure 1.5 shows that in many countries relatively few adults participate in upper secondary VET - with an OECD average of 17%, and fewer than 5% of older students in 14 out of 34 countries. In countries like Ireland and New Zealand the very high share of older learners reflects the fact that VET is predominantly a post-school option, whereas the relatively high shares in Denmark and Finland show that VET can serve young and adult learners at the same time. At the short-cycle tertiary level, which has predominantly vocationally or professionally-oriented programmes, the share of older learners differs strongly between countries - with countries like France, Korea, Mexico and Portugal having at most 15% of learners aged 25 or older compared to at least 70% in Iceland, Poland, Sweden and Switzerland. However, these programmes are relatively small in many countries (see Chapter 2). In countries with low enrolment of adults in VET programmes, adult learning may predominantly be in non-formal training or in academically-oriented formal education and training programmes (e.g. higher education delivered by universities).

Figure 1.5. Share of adults in upper secondary VET and short-cycle tertiary programmes (2018)



Note: Data for Belgium (French Community) in Panel B exclude participants in adult higher education.
Source: OECD (2020[15]) *Education at a Glance 2020: OECD Indicators*, https://dx.doi.org/10.1787/69096873-en (Panel A); OECD (2022[21]), *Pathways to Professions: Understanding Higher Vocational and Professional Tertiary Education Systems*, https://doi.org/10.1787/a81152f4-en (Panel B).

As such, VET has the potential to prepare young people for the labour market and to support adults in their upskilling and reskilling, but it may require re-engineering on various fronts to achieve that potential. Firstly, VET will need to stay relevant in light of changing skill needs in labour markets and societies. This will require aligning the offer and content of programmes with employer requirements, but also giving sufficient opportunities for learners to develop the transversal skills need to be adaptable. Secondly, VET needs to be a vehicle for lifelong learning, both in terms of offering programmes that are accessible and relevant for adult learners and in terms of providing effective pathways for learning after VET. Such a re-engineered VET system should be underpinned by solid career guidance efforts that help young people and adults navigate change and find their way into VET. It should also be coupled with efforts to make the VET system inclusive, so that it is an attractive and accessible option for learners from various backgrounds and with different needs and aspirations. These re-engineering efforts could be supported by increased technology use in VET, which has the potential to make VET more accessible, attractive, effective and efficient.

Building future-ready VET systems

This report looks at different elements of future-ready VET systems, focussing on responsiveness, flexibility and inclusion, supporting transitions, and innovation. For each of these dimensions, the report presents a set of key questions that policymakers and other VET stakeholders should consider when re-engineering VET to make it more future-ready. While the report does not aim to come up with one particular answer or solution for these questions - and different VET systems will require different approaches - it provides an overview of data and evidence that highlight the importance of the questions for the future of VET and describes a large range of policies and practices put in place in OECD countries and beyond to move towards more future-ready VET systems.

The four dimensions and the corresponding key questions are presented below. Each dimension is explored in detail in the remaining chapters of this report.

Creating responsive VET systems

To ensure that VET programmes remain relevant for learners and employers in a changing world of work, they need to be aligned with labour market needs. VET programmes could be provided at various levels of education, including at the tertiary level, and in a variety of fields. The use of high-quality information on skill needs, based on a range of data sources and stakeholder inputs, is crucial in the design of responsive VET systems. Moreover, strong engagement with social partners in the different phases of VET policy can contribute to ensuring that relevant and up-to-date programmes are provided. Information on skill needs should also be used to inform skills development opportunities for VET teachers.

Key questions for designing responsive VET systems include:

- How can labour market data inform VET systems?
- How can social partners contribute to a more responsive VET system?
- How can higher vocational and professional tertiary education programmes satisfy the demand for higher-level professional skills?
- How can VET teachers be equipped with the right skills?

Making VET more inclusive through increased flexibility

VET can play an important role in providing training opportunities to a broad audience. Therefore, sufficient flexibility is needed to ensure that students with different personal characteristics, needs and aspirations can have access to VET programmes that are tailored to their needs. In light of changing skill needs, VET

can foster lifelong learning by providing accessible and relevant opportunities for up-skilling and re-skilling to adults.

Key questions for designing flexible and inclusive VET systems include:

- How can VET serve young people at risk?
- How can migrants and refugees be supported in their VET journey?
- How can VET be made more accessible to adult learners?

Supporting transitions

A changing world of work implies that individuals will need to be able to adapt to change throughout their working lives. Ensuring that initial VET students leave the education system with strong foundational skills will be important to ensure that they can successfully engage in further learning to keep their skills up to date. Moreover, strong transversal skills will help VET graduates be resilient and adaptable. To ensure that individuals can navigate a changing labour market and are able to find VET programmes that suit their needs, solid career guidance is essential.

Key questions for designing VET systems that support transitions into the labour market and further learning include:

- How can VET develop solid transversal skills?
- What do effective progression opportunities for VET graduates in higher education look like?
- How can career guidance support smooth transitions?

Innovating in VET

The use of new teaching and learning methods can support the effective delivery of VET. This includes the use of new technologies, such as simulators and virtual reality, in classrooms and in workplaces, but also the use of innovative pedagogical approaches. Such innovation requires strong leadership in VET institutions, well-trained VET teachers, and strong coordination with the world of work.

Key questions for designing innovative VET systems include:

- What are the potential benefits of digital technologies in VET?
- How can digital technologies be used more effectively in VET?
- How can VET adopt innovative pedagogical approaches?

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Note

[1] Fit for 55 refers to the EU’s target of reducing net greenhouse gas emissions by at least 55% by 2030. The Fit for 55 package is a set of proposals to revise and update EU legislation and to put in place new initiatives with the aim of ensuring that EU policies are into line with the climate goals agreed by the Council and the European Parliament.

2 Creating responsive vocational education and training systems

This chapter looks at the responsiveness of the range and content of vocational education and training (VET) programmes to changing skills needs. It discusses how labour market data can inform VET policy and delivery, and the important role of social partner engagement. It also looks at the need for VET at higher levels of education and how such programmes can be designed. Lastly, it discusses the need for investing in the right skills for VET teachers.

Introduction

As discussed in Chapter 1, skill needs in labour markets and societies are changing due to structural factors such as the digital and green transition. As the key role of VET is to prepare learners for the labour market, it should be ensured that the offer and content of VET is well aligned with the skills that employers are looking for. This requires a good understanding of current and anticipated skill needs. Such information on skill needs can inform the design of VET policies, as well as the delivery of VET.

Understanding skill needs is typically not an easy task and requires putting together information from various sources. One important input is that from employers, who generally have the most direct view on what their needs are. According to Renold et al. (2016[1]), employer engagement can take place in the curriculum design, application and feedback phase. In the curriculum design phase, employers can be involved in setting qualification standards, as well as in the development of student evaluation guidelines. Employer involvement in the application phase mainly happens through the provision of work-based learning, but employers can also be involved in other areas, such as quality assurance of work-based learning, cost-sharing agreements, the provision of equipment and teachers, and the inclusion of a workplace component in student evaluations. Finally, in the feedback phase, employers can share information about student outcomes and skill needs to feed into the re-design of curricula, and they can be involved in determining the optimal timing for curriculum re-design. The inputs from employers should be carefully balanced with other sources of information, to ensure that VET design and delivery reflects a wider view on skill needs, including those that go beyond the needs of a limited group of employers and those that reflect longer-term needs and broader societal needs.

This chapter discusses key questions for designing responsive VET systems. It looks at two important sets of inputs into VET design: information from labour market data and engagement with social partners. Moreover, it looks at the role of professional tertiary education as a way to develop the VET offer at higher levels of education as the demand for higher-level technical skills grows. Lastly, the chapter discusses the importance of also updating the skills of VET teachers in line with changing skill needs in labour markets and societies.

How can labour market data inform VET systems?

High-quality information on skills demand and supply can help designing responsive VET policies and programmes that support economies in getting access to workers with the right skills. This type of information can contribute to avoiding and tackling skills imbalances and to improving labour market outcomes of VET students. Countries differ widely in terms of methods used to identify their skill needs, but also in terms of the level at which these exercises are conducted and stakeholder involvement (OECD, 2016[2]).

Using a wide range of data sources

In general, an assessment of skill needs should build on a wide range information, including quantitative information from a variety of sources (e.g. labour force survey, employer surveys, vacancy data, graduate tracer surveys) and qualitative information gather from key stakeholders in the skills system. Box 2.1 provides examples from the Unites States and South Africa on the use of various data sources to determine local and national needs.

Box 2.1. Identifying skill needs

United States: Comprehensive local needs assessment

The Strengthening Career and Technical Education for the 21st Century Act (Perkins V) is a federal education programme that invests in secondary and postsecondary career and technical education (CTE) programmes in all states and territories of the United States. States designate an eligible agency to administer Perkins, and at the local level funds can go to CTE providers (e.g. comprehensive and technical high schools, community and technical colleges, pre-apprenticeship/youth apprenticeship programmes, tribal educational agencies) (ACTE, 2019[3]).

A requirement for local eligible recipients to receive Perkins V financial assistance is to conduct a comprehensive local needs assessment (CLNA) and to update it at least every two years. The CLNA should be completed by collaborating and engaging with a diverse group of stakeholders. The CLNA must include an evaluation of the performance of the students. It must also include a description of how career and technical education programmes offered by the eligible recipient are sufficient in size, scope, and quality to meet the needs of all students served by the eligible recipient; aligned to state, regional, tribal, or local in-demand industry sectors or occupations identified by the state workforce development board or local workforce development board; and designed to meet local education or economic needs not identified by state boards or local workforce development boards (ACTE, 2019[3]).

Data of use to the needs assessment process can come from internal sources, such as student performance data, student and parent survey findings and feedback from local industry advisory boards, or from external sources, including state labour market information and results of state or third-party evaluations of programmes. Several states have developed guides to support the development of the CLNAs (ACTE, 2019[3]).

South Africa: List of Occupations in High Demand

In South Africa, the Department for Higher Education and Training publishes every other year a List of Occupations in High Demand. The list includes occupations that experience strong employment growth and/or face shortages in the labour market. To compile the list, a bottom-up quantitative component and a top-down qualitative component are combined. The quantitative part of the exercise uses nine indicators to measure employment pressure, wage pressure, vacancy pressure, and strategic demand by occupation. The quantitative evidence was cross-checked with qualitative inputs, such as for example the sectors skills plans developed by the Sector Education and Training Alliances (DNA Economics, 2020[4]).

The list is designed to be used for enrolment planning at universities, VET colleges and other education and training institutions; for the development of new qualifications, especially to respond to new and emerging occupations and skills needs; for resource allocation processes; and for career guidance for learners and jobseekers (Republic of South Africa, 2020[5]). For example, one of the objectives of the South African National Skills Fund is to fund 190 000 learners for education and training towards occupations featuring on the list of occupations in high demand over the period 2020-2025 (National Skills Fund, 2020[6]).

Information about labour market outcomes of VET students provides interesting insights that can be used in VET policy making. To gather more detailed information on these outcomes, a tracer study can be put into place. Such a tracer study allows following VET graduates in the labour market or further education at different points after graduation. Information can be collected on aspects such as the time needed to find a job, characteristics of the jobs (e.g. occupation, tasks, wages, working time arrangements), reasons for working in jobs outside of one's field, etc. Moreover, if these tracer studies collect detailed information

about the type of VET training the graduate went through (e.g. dual programmes, other forms of work-based learning, detailed field of study, private versus public institutions), it is also possible to compare outcomes by types of VET provision. This type of information can be used to improve the quality of VET and to align programmes better with the needs of the labour market. Box 2.2 provides more details of tracer surveys in the VET sector.

Box 2.2. Tracer studies in VET

Tracer studies are widespread in higher education but also often employed in the VET sector. Research from the European Commission shows that 19 member states (out of a total of 28 member states at the time of the analysis) have implemented at least one tracer study on a regular basis. Moreover, tracking is a legal obligation in Estonia, Finland, Portugal and Sweden. Tracer studies can be the responsibility of national-level institutions or of VET providers.

Programmes or projects seeking reform of VET, which try to improve skills match and the transition from school to work, use data from tracer studies to measure their effectiveness. Education institutions are also increasingly interested in feedback from their former students to improve their study programmes, and to show new applicants how their graduates have managed the transition to employment. Graduates are usually invited to provide feedback about their experiences on the labour market one to two years after graduation.

The information required from the graduates commonly includes:

- duration of search for the first job; methods of job search
- employment status at the time of the survey (about one to two years after graduation)
- income level
- working time; type of contract
- job title; economic sector (private or public); economic branch
- required knowledge and skills (competencies)
- relationships between study and work (horizontal and vertical match)
- further education and training
- regional and international mobility
- personal background characteristics.

Sometimes this core information from graduates is supplemented with aspects of educational experiences before and during the course of study/training, such as the knowledge and skills gained, practical and work experience, evaluation of the study conditions and provisions. Such information is especially useful if the tracer study is to allow conclusions about the relevance of elements of education/training (such as the curriculum) to the labour market.

Source: ETF, ILO and Cedefop (2016[7]), Carrying out tracer studies: Guide to anticipating and matching skills and jobs - Volume 6, www.etf.europa.eu/sites/default/files/m/45A4CE81F3398029C1258048005BEFB8_Vol.%206%20Carrying%20out%20tracer%20studies.pdf; European Commission (2018[8]), *Mapping of VET graduate tracking measures in EU Member States*, https://op.europa.eu/en/publication-detail/-/publication/00d61a86-48fc-11e8-be1d-01aa75ed71a1#document-info.

To shape effective and timely VET and skills policies, decision-makers need faster and more detailed collection and analysis of information on current and future skill needs and trends. Using information available online – or 'web-based big data' – for labour market analysis and skills intelligence is currently high on the policy agenda – especially in light of the changes brought about by the green and digital transition. Such web-based big data include electronic CVs available through online platforms or social

networks, job advertisements published on job portals, and online descriptions of education and training programmes and qualifications on offer. The 'bottom up' information contained in web-based big data is its main added value. The more detailed information on skills, occupations and careers, qualifications and other job requirements and characteristics in online job advertisements and CVs opens up many opportunities to strengthen labour market and skills intelligence. Trends analysis can be undertaken because data can be collected frequently. Table 2.1 gives an overview of the potential of web-based big data on skills for government, education and training providers, employers and individuals.

Table 2.1. Potential of web-based big data for labour market actors

	Governments (national, regional)	Education and training providers	Employers	Individuals
Information potential	- More real-time monitoring of labour market trends - More detailed and regionally adapted skills anticipation - Additional insight into what broader trends mean for skills demand and supply	- Faster insight into changes in professional practice - More insight into demand for occupations and skills in the regional context - Better understanding of regional skills supply and demand imbalances	- More real-time insight into emerging trends in occupations and skills - Additional insight into regional labour market situation - Better understanding of critical skills bottlenecks	- Better understanding of skills increasingly in demand - More contextually adapted (region/ sector) labour market and skills intelligence - Increased understanding about labour market opportunities
Policy/action potential	- Stronger feedback loops - More proactive skills policy - More responsive up-/reskilling measures - More evidence-based competitiveness policy/strategy	- Increased capacity to respond to changing skills needs - More evidence-based programme offer - More effective and proactive careers information and guidance provision	- Increased capacity to map corporate skills needs - More evidence-informed recruitment policy - More forward-looking approach to training and development	- More informed education and training choices - More proactive approach to developing career and employability - More successful transitions between occupations

Source: Adapted from Cedefop; European Commission; ETF; ILO; OECD; UNESCO (2021[9]), *Perspectives on Policy and Practice: Tapping into the Potential of Big Data for Skills Policy*, https://data.europa.eu/doi/10.2801/25160.

Producing web-based big data requires a data production system for data ingestion, data pre-processing, information extraction and data use/ presentation, and developing such a system is complex. Moreover, using web-based big data for skills analysis requires a mature online job market. A well-developed internet infrastructure and good and widespread connectivity are preconditions. Statistical biases, representativeness and conceptual challenges complicate big data analysis and make drawing valid conclusions challenging. Big data are unstructured and usually non-random and tend to cover particular labour market segments (such as highly skilled or ICT occupations in public portals or lower-skilled positions in some public employment service sources) better than others. As such, when analysing and presenting big data, especially to the public, researchers and policy makers must always bear in mind the nature and character of such data to avoid misinterpretation. Cedefop; European Commission; ETF; ILO; OECD; UNESCO (2021[9]) note that is not advisable to use big data as a substitute for mainstream labour market analyses, but rather to treat such big data as a complement to labour market and skills intelligence. This is the approach taken in Malaysia, for example, where the Critical Occupations List is elaborated by combining information from online job advertisements with other traditional data sources and bottom-up quantitative or qualitative inputs (OECD, 2019[10]).

Making the data accessible

Across OECD countries, results from skills assessment and anticipation exercise have mainly been used by governments to update occupational standards; design or revise training policies for workers or the unemployed; design, revise or decide on the allocation of courses provided in formal education. In addition, some governments use this information to guide migration policy, as well as their transition to a digital or green economy. Social partners (employer organisations and trade unions) also use this information to

lobby governments on education and employment policy, develop training programmes, or provide advice to their members on skill development. Both social partners and governments use the information for broad dissemination purposes to inform workers and students about trends in current or future skill demand and supply (OECD, 2016[2]).

Despite some good practices in the use of skill assessment and anticipation information in countries, governments and social partners still face several barriers when it comes to using the available information. In general, the identified barriers are twofold: i) involving and co-ordinating with stakeholders; and ii) bringing the skills assessment and anticipation exercises closer to the needs and requirements of policy makers (OECD, 2016[2]). In Australia, Jobs and Skills Australia (former National Skills Commission) was set up to provide more and better information on skill needs to government, employers and learners (Box 2.3).

Box 2.3. The Australian National Skills Commission and Jobs and Skills Australia

In recognition that understanding where the jobs in demand are, and what skills are needed to do those jobs, is of crucial importance for building a strong economy for the future, Australia set up the National Skills Commission in July 2020 to monitor, research and analyse employment dynamics across different demographic groups, industries, occupations and regions. The focus of the commission is on three long-term outcomes:

- To make an enduring and relevant contribution to labour market information.
- To improve the quality, accessibility and relevance of VET.
- To contribute to a labour market that effectively aligns skills needs with education and training.

The Commission's analyses provide students, industry and governments with information about how effective courses – and the VET system overall – are at leading students into quality jobs in areas of skill demand. This information helps students make better choices about what to study and guides government decisions about where to invest public funds.

At the end of 2022, the Australia Government established Jobs and Skills Australia (JSA), a statutory body to provide independent advice on current, emerging, and future workforce, skills, and training needs. JSA is carrying forward the work commenced by the National Skills Commission. It has a broader remit, focusing on workforce planning and fostering working partnerships with state and territory governments, unions, industry, and education providers. JSA continues to provide advice to government and publish data and other information, including on Australia's current and emerging labour market, future skills and training needs and priorities, and the adequacy of the vocational education and training system.

Source: Australian Government (n.d.[11]), *National Skills Commission*, www.nationalskillscommission.gov.au/; Australian Government (2023[12]), Jobs and Skills Australia, www.jobsandskills.gov.au/.

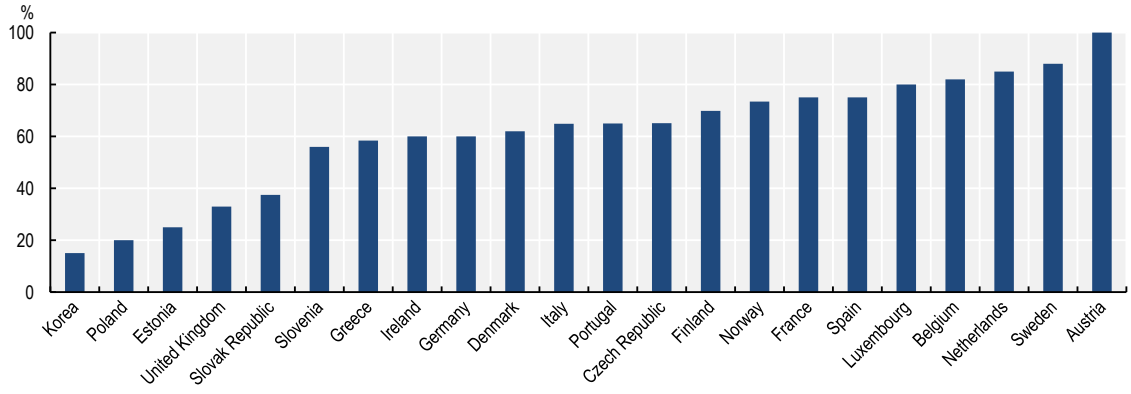
How can social partners contribute to a more responsive VET system?

The engagement of social partners (i.e. employers and trade unions) ensures that the skillsets embodied in vocational qualifications reflect occupational needs, that the mix of training provision between different occupations matches the mix of demand for jobs of different types, that programmes reflect the broader needs of workers, and that opportunities for work-based learning (see next section) are of high quality.

How employers and trade unions are involved in VET typically depends on the organisation of labour and employers and the role they play more broadly in designing and implementing policy. In places where trade

unions are weak or non-existent (e.g. South Carolina in the United States), employers are the ones to have the strongest voice in the VET system. Likewise, where employer associations are weak, it may be difficult for employers (and especially small ones) to influence VET if they fail to coordinate and agree on a common position. Figure 2.1 shows that employer organisation density various considerably between OECD countries.

Figure 2.1. Employer organisation density



Note: Latest year is 2008 for Greece, Ireland and Portugal; 2009 for Korea; 2012 for Denmark, France and Italy; 2013 for the Netherlands, Slovenia and Spain; 2014 for Belgium, the Czech Republic, Finland, Germany and Luxembourg; 2015 for Estonia and the Slovak Republic; 2016 for Norway, Sweden and the United Kingdom; and 2017 for Austria.
Source: OECD (2019[13]) *Negotiating Our Way Up: Collective Bargaining in a Changing World of Work*, https://doi.org/10.1787/1fd2da34-en.

Social partners' involvement can be described as a continuum between two extremes: on the one hand social partners run vocational education and training that is provided entirely on-the-job, and on the other hand bodies in charge of VET institutions such as national, regional and local governments keep the full responsibility for vocational education and training with no input from social partners and no training in companies. The majority of initial VET programmes targeting young people fall somewhere in between. Social partners' engagement would typically be strong in apprenticeship systems whereas in school-based VET it would be less prominent.

Countries differ substantially in the extent to which they involve social partners in VET and the mechanisms for doing so. A Swiss study attempts to measure the degree of linkage between actors from VET and employment systems across countries (Renold et al., 2016[1]), focussing on employers only and their co-operation with other stakeholders during development, implementation and evaluation of VET curriculum. The study finds that VET systems balancing the influence of the education side and social partners contribute to strong labour market outcomes among VET completers. According to the authors, in such VET systems (e.g. in Denmark and Switzerland) students receive a substantial part of their education and training in companies and social partners are involved in the design and update of qualification standards, examination and assessment requirements (Renold et al., 2016[1]).

Strong VET systems, drawing on social partner engagement, yield benefits to employers by increasing the pool of qualified labour, and benefit students by facilitating their transition to skilled employment. In Sweden, a study looking at the provision of work placements in upper- secondary VET shows that a strong partnership between the school and local councils improves outcomes from VET (Lundin, 2016[14]). Moreover, the collective involvement of social partners in VET as a valuable spin-off, can encourage innovation in firms. Social partners are able to reflect upon, and share information, new technologies, production and training methods while updating the components of VET programmes. This effect is found to be stronger for small firms, implying there is a transition of knowledge and innovation from larger companies to smaller ones (Rupietta and Backes-Gellner, 2017[15]).

Engaging social partners in the design of VET policies and programmes

The engagement of social partners in the design of VET programmes and policies often happens through employer associations and trade unions which represent the interest of groups of employers and workers. For example, Germany has a network of Chambers of Commerce and Industry that represent the majority of employers from different sectors. The membership is compulsory as all registered companies in industry, commerce or service are required by law to be a member of a Chamber of Commerce and Industry. The Chambers play a key role in provision of VET (among other things). In some countries such as Switzerland, the role of different stakeholders in defining VET qualifications and standards of VET programmes is legally defined and guaranteed (Box 2.4).

In countries where employers (and trade unions) are less well organised, involving them in VET is more challenging (Gallacher and Reeve, 2019[16]). In particular, it is more difficult to identify employers who represent interests of the entire industry, and it can be particularly difficult to engage medium and small enterprises. From this perspective, the recent Scottish efforts to engage employers in VET is informative. In Scotland (United Kingdom), employers' input into education and training has traditionally been limited - notwithstanding a clear political will of the Scottish Government to involve employers into VET policy. Gallacher and Reeve (2019[16]) show that despite financial incentives for VET providers to forge partnerships with employers, involvement of companies in VET in Scotland remained limited. To address this issue, the Scottish Government has built over recent years a framework to facilitate social partners' involvement in apprenticeships. The framework takes into account features of social partner organisations and the way they interact with educational institutions, recognising that models of social partners' involvement from countries with different characteristics may not be appropriate for Scotland. In the Scottish model, Technical Experts Groups (TEG) play a key role in the development of new and update of existing apprenticeships. These are bottom-up bodies composed of 10 to 15 people including employers and trade unions. TEGs are short-lived as they are set up with the sole aim of developing or updating apprenticeships. In a context where employers' input into VET policy has been limited, it may be easier to guarantee employers' involvement if it is done on an ad hoc basis, when specific needs emerge (Skills Development Scotland, 2022[17]). Annex 2.A provides more information on how Scotland (United Kingdom) involves social partners in the development of apprenticeship qualifications.

New Zealand is another country that has recently strengthened the position of social partners. Major VET reforms were announced in 2019 and implemented from 2021 to address a range of issues, including employer engagement (Huntington, 2022[18]) and concerns that a lack of skills availability could threaten future economic growth (Rother, 2019[19]). The reforms aimed to create a stronger, more unified, and sustainable system by reforming funding and establishing a single national public provider (*Te Pūkenga*). *Te Pūkenga* absorbed the regional public providers of off-job VET and most industry training and must "develop meaningful partnerships" with industries and communities (Ministry of Education, 2020[20]). While previously, industries had significant power over workplace-based education through New Zealand's industry training system but weak direct influence in other parts of vocational education, the reforms established six industry-led Workforce Development Councils (WDCs) with employer and employee governance. The WDCs retain the qualification and standards development function of former industry training organisations, but they have an expanded remit to cover all VET – not just workplace learning. They also give industries stronger strategic levers in the skills system, as WDCs have a formalised skills leadership function, provide advice on public investment in VET, and are explicitly expected to engage with issues such as sustainability, workforce supply, equity, and the needs of Māori.

Also in the Republic of Türkiye (hereafter 'Türkiye'), efforts have been made to increase collaboration with employers in VET. The Directorate General of Vocational and Technical Education of the Ministry of National Education (MoNE) carries out sector co-operation agreements with various stakeholders representing public institutions and organisations as well as private sector and non-governmental organisations. These agreements cover aspects such as support for improving the qualifications of VET

teachers, updating VET curricula, and transferring technological developments from industry to VET providers. The Turkish the Ministry of National Education has more than 200 co-operation agreements with institutions and organisations (status in 2023). In addition to the protocols signed centrally, protocols can also be signed by provincial and district national education directorates.

Box 2.4. Distribution of responsibilities for VET in Switzerland

In Switzerland, the federal government through its agency, the State Secretariat for Education, Research and Innovation (SERI), has overall responsibility for vocational programmes at upper-secondary and post-secondary level in terms of the content of qualifications, including curricula and assessment criteria. SERI is responsible for regulating and co-funding the VET and professional education sectors (SERI, 2022[21]; Swiss Confederation, 2003[22]). SERI fulfils the following missions:

- Ensures the quality and further development of the Swiss VET system
- Ensures comparability and transparency of courses throughout Switzerland
- Enacts VET ordinances that represent the legal basis for each upper-secondary vocational programme in Switzerland (around 245 in 2022)
- Approves regulations for federal examinations (around 420 in 2022) and core syllabuses for professional colleges
- Recognises training courses for teachers, trainers, instructors and examiners within the upper-secondary and post-secondary VET sectors as well as training courses for vocational, educational and career guidance counsellors
- Recognises foreign qualifications
- Funds the VET system
- Promotes innovation and support specific activities in the public interest.

The Confederation generally works with national professional organisations (include trade associations, industry organisations, social partners, other responsible organisations and VET providers) to carry out activities (Swiss Confederation, 2003[22]).The input of professional organisations into VET includes:

- establishing the training content of all vocational programmes
- establishing national qualification procedures for vocational programmes; imparting professional competences at tertiary level (professional education)
- developing new training courses; organising branch courses
- managing vocational and professional education and training funds.

Professional organisations can propose new VET programmes or request an update of existing ones. To this end, professional organisations must demonstrate a demand for the proposed programmes. The creation of the new programme is then confirmed by SERI after ensuring the programme does not overlap with existing ones (SERI, 2015[23]). A similar procedure applies to the amendment of existing programmes.

At the regional level, the cantons i) supervise apprenticeships, vocational schools and professional education institutions; ii) provide vocational, educational and career guidance services; iii) prepare young people for enrolment in vocational programmes; iv) issue permits authorising host companies to take on apprentices and/or trainees; and v) provide training to trainers at host companies.

Designing effective governance arrangements to involve social partners at various levels

Social partners are involved in VET at different levels. They can sit on bodies advising national and regional governments, collaborate with local VET providers, and provide input into VET programmes corresponding with their sectors. National level bodies typically coordinate and overview VET policy. Depending on the country, some of these overarching responsibilities can be shared with regional levels.[1] Germany provides an interesting example, as school-based VET is fully managed by *Länder* (regions) whereas in apprenticeships the responsibility is shared between the federal (i.e. national level) and regional administrations. Social partners are typically organised by industry sectors and provide input in VET programmes corresponding to their area of expertise. For example, social partners representing the construction sector contribute to the development and update of curriculum of VET programmes in construction.

In some countries, VET institutions (i.e. schools or providers) are also expected to set up relationships with social partners. For example, in Denmark, VET colleges and local training committees are encouraged to work closely together to ensure better coherence between school-based and work-based learning, for example through identification of specific tasks or problems that companies face and subsequent alignment of the contents of school-based education and training (Box 2.5) (National Educational Authority Danish Ministry of Education, 2008[24]).

The influence of social partners can be just consultative, or alternatively can involve full decision-making. Typically, social partners' role is stronger in apprenticeships than in school-based VET. The high level of involvement of the social partners in the former reflects the central role of the employer in apprenticeship: relative to other forms of vocational training, employers therefore have more obligations but also more control. In many apprenticeship systems social partners decide on occupational qualifications, corresponding skills, assessment requirements and methods, and the content and delivery of work placements (e.g. in countries such as Austria, Denmark, Germany, Norway and Switzerland). Norway has recently reinforced the role of social partners in apprenticeship in relation to the content of training taking place in companies (Utdanningsdirektoratet, 2017[25]).

Irrespective of the exact institutional organisation, effective arrangements should allow social partners to provide their input into VET regularly, in a timely manner, and in all relevant areas. Box 2.5 describes the form of social partner involvement in Denmark, Norway and Sweden. In the three countries, systematic arrangements give the social partners an active role either at national regional or institution level and provide them with an opportunity of shaping the content and provision of VET programmes.

Box 2.5. Involvement of social partners in VET at the national, regional and institutional level

Denmark

At the **national level**, the national advisory council on vocational upper-secondary education and training (*Rådet for de grundlæggende Erhvervsrettede Uddannelser*) meets 8-10 times a year. It advises the ministry on the establishment of new VET programmes and changes in existing ones. The council includes representatives of the social partners, local governments and regional organisations, schools, teachers, and student associations. There are 31 representatives from the employer and employees organisations in the council (Undervisnings Minsteriet, 2018[26]).

Around 50 national trade committees (*faglige udvalg*) are responsible for 106 VET upper-secondary programmes, and are composed of and funded by employer and employee organisations. Trade committees update existing courses and propose new ones, define learning objectives and final examination standards; decide the duration of the programme, and the ratio between college-based teaching and practical work in an enterprise; approve enterprises as qualified training establishments

and rule on conflicts which may develop between apprentices and the enterprise providing practical training; issue journeyman's certificates in terms of content, assessment and the actual holding of examinations (Andersen and Kruse, 2016[27]).

At the **institution level**, each vocational college (providing school-based education and training) work with at least one local training committee that includes representatives of local employers and employees appointed by national trade committees, and representatives of staff, management and students appointed by colleges. Local training committees work closely with colleges to adapt the content of VET programmes to local needs, strengthen contacts between the college and local employers, and support colleges with the delivery of programmes, for example by securing work placements for students. They also serve as a link between local and national levels, ensuring that national committees have a good overview of local circumstances and that local policy is aligned with national objectives. For example, they assist and advise national trade committees in approving local enterprises as qualified training establishments and in mediating conflicts between apprentices and enterprises (Andersen and Kruse, 2016[27]). The National Committees can hand over obligations to the local trade committees if they are better taken care of at the local level.

Norway

At the **national level** there is a National Council for VET (*Samarbeidsrådet for yrkesopplæring*), appointed by the Ministry, and ten Vocational Training Councils (*Faglige råd*), one for each VET programmes, where social partners are represented. These bodies have an advisory role in respect of the first two school-based years of apprenticeships but play a more active role as regards the last two work-based years of apprenticeships. The government has to take into account the proposals of the social partners unless they are against the law or involve a substantial increase in public spending.

The National Council is responsible for the overview of the overall VET policy whereas Vocational Training Councils are busy with development of VET programmes corresponding to their field of specialisation. Among others, they suggest new programmes and ensure the existing VET programmes content is up-to-date, act as a link between the world of work and school. The Norwegian Directorate for Education and Training is the secretariat for the national and the training councils and has a co-ordinating role (Utdanningsdirektoratet, 2021[28]).

At the **regional (county) level**, social partners sit on 11 Vocational Training Boards (*Yrkesopplæringsnemnda*), one for each region.[2] They provide advice on quality, career guidance, regional development and the provision in the county to meet local labour market needs (Norwegian Centre for International Cooperation in Education (SIU), 2016[29]). County authorities are also responsible for approving enterprises that provide apprenticeship training. While counties are free to develop their approval procedure they typically involve social partners from the relevant sector in the process.

Sweden

In Sweden at the **national level** there 18 national upper-secondary programmes 12 are vocational, all offered either as a school-based programme, or as an apprenticeship. Since 2007, Sweden has developed a permanent national framework for social partners' involvement. In 2010, programme councils for each national upper-secondary VET programme were created (Statens offentliga utredningar (SOU), 2015[30]) Thirteen sectoral National Programme Councils (*nationella programråd*) concern themselves with the 12 national vocational programmes. Each council has 8-10 members representing industry, social partners, and sometimes national and regional authorities, and meets around six times a year (Ministry of Education Sweden, 2018[31]) Councils advise the National Agency for Education (the government agency that manages, on behalf of the Ministry of Education, the Swedish school system for youth and adults, including upper-secondary VET) on the quality, content

and organisation of upper-secondary VET for youth and adults, aiming to match VET provision to labour market needs. The councils advise on proposals for new subjects or courses submitted by the National Agency, which may lead to modification of the proposals, or possibly even their abandonment (Equavet, n.d.[32]). Social partners reported to the visiting OECD team that they were generally satisfied with this framework. This is a major achievement, as international experience shows that establishing employer engagement in VET systems can be extremely challenging.

At the **institution level**, schools are expected to set up collaborative arrangements with one or more Local Programme Councils (*lokala programråd*) in areas corresponding to the VET programmes available in the school. Local Councils are expected to include representatives from local working life, other stakeholders and social partners, and their role is to advise schools on how to adjust VET programmes to local labour market needs and support VET provision, for example by finding work placements for students. But the influence of local council varies greatly (Lundin, 2016[14]; Statens offentliga utredningar (SOU), 2015[30]). Local councils are not legally regulated (Ministry of Education Sweden, 2018[31]), and schools are free to organise local councils to fit their needs, so that there is much variation in the quality of local partnerships.

Providing more and better opportunities for work-based learning

In most countries, schools share the responsibility for delivering VET with companies, i.e. some vocational education and training is provided in schools and some by companies. Employers' provision of training to students, i.e. work-based learning (WBL), represents their largest contribution to VET. WBL refers to learning through participation and/or observation of work under the supervision of an employer. The intensity of WBL differs across VET programmes. In some VET programmes a mandatory WBL component represents an important element of the learning experience. Other VET programmes are more dependent on schools, with work-based learning being an optional and sometimes minor element. In programmes with longer periods of WBL students typically contribute with some productive work, whereas the amount of productive work performed by students in shorter WBL is limited. Table 2.2 compares work-based learning in apprenticeship and school-based vocational programmes – recognising that it provides a simplified picture since VET programmes are very diverse.

Table 2.2. Comparison of work-based learning (WBL) in apprenticeship and school-based programmes

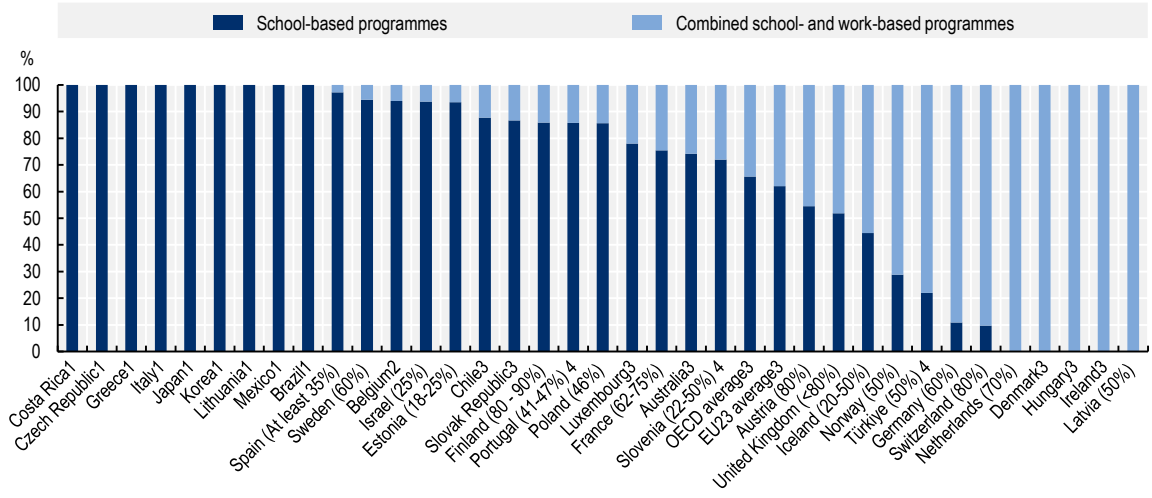
	Apprenticeship	WBL in school-based VET
Is WBL mandatory?	- In most OECD countries WBL is mandatory (e.g. Denmark, Finland, Germany, Israel, the Netherlands, Norway, Sweden, Switzerland, and Türkiye). - In countries such as Australia and the United Kingdom, apprentices have to be employed but whether apprentices receive any training on-the-job in addition to their regular work is not always specified.	- Can be mandatory (e.g. Finland, the Netherlands, Sweden, Türkiye) - Or optional (e.g. Estonia, Korea)
What is its duration?	Apprentices spend most of their programme time in companies.	VET students spend most of their programme time in school
What is the status of participants?	- In many OECD countries, including Sweden, apprentices have a special apprentice contract. - In some countries such as Australia, Canada and England (UK), apprentices are regular employees.	Typically participation in WBL does not involve any change in the status of VET students
Do participants receive a wage/allowance from the employer providing WBL?	-In the majority of OECD countries apprentices receive a wage. -In few countries such as Sweden employers are not obliged to pay a wage to apprentices	Most of the time VET students do not receive any compensation from the employer.
What is the role of social partners?	Often they have a decisive role on many aspects of the programme, and in particularly on elements of work places.	Typically an advisory role.

Source: Adapted from Kuczera and Jeon (2019[33]), *Vocational Education and Training in Sweden*, https://dx.doi.org/10.1787/g2g9fac5-en.

As shown in Figure 2.2, in some countries, such as Denmark, Germany, Hungary, Latvia and Switzerland nearly all upper-secondary VET students receive WBL, while in Italy, Japan, Korea and Spain, VET is provided mainly in schools. In countries with apprenticeships such as Austria, Germany, the Netherlands, and Switzerland students spent most of their time while in WBL (i.e. 60-80% depending on the country).

Figure 2.2. Distribution of upper-secondary vocational students by the provision of work-based learning (WBL) in vocational programmes (2018)

Full- and part-time students enrolled in public and private institutions



Note: Figures in parentheses refer to the most typical duration of the work-based component as a percentage of the total programme duration for combined school- and work-based programmes. For example, in Germany, more than 98% of students in combined school- and work-based programmes are enrolled in a programme where the duration of the work component accounts for about 60% of the total programme duration.
1. Data on typical duration of the work-based component are not applicable because the category does not apply.
2.The most typical duration of the work-based component is at least 46% for the Flemish Community of Belgium and 60% for the French Community of Belgium.
3. Data on the most typical duration of the work-based component are missing.
4. The share of students enrolled in combined school- and work-based programmes as a percentage of all students enrolled in upper secondary vocational education is estimated based on the results of the INES ad-hoc survey on VET.
Source: OECD (2020[34]), *Education at a Glance 2020: OECD Indicators*, https://dx.doi.org/10.1787/69096873-en.

Learning in a workplace is an essential part of VET and can yield benefits to students and employers. The benefits depend on both the length and quality of work placements and together these factors define how effective WBL is in developing the skills required in target jobs, and in transitioning people, particularly young people, into the labour market.

- Workplaces provide a strong learning environment. WBL allows students to acquire practical skills on up-to-date equipment and supported by trainers familiar with the most recent working methods and technologies. Rapidly changing technologies mean that equipment quickly becomes obsolete, and VET schools are sometimes unable to afford modern equipment. Workplace training will therefore often be more cost-effective since it makes use of equipment already available in enterprises.
- WBL improves school-to-work transition. There is some evidence that VET graduates who have experienced more WBL (such as apprentices) have stronger labour market outcomes, in terms of lower duration of job search, fewer unemployment spells and higher wages, than those who choose another type of upper-secondary education. Overall, countries with a high share of youth in

apprenticeships have lower rates of disconnected youth and youth experiencing a difficult transition to employment (Quintini and Manfredi, 2009[35]).

- WBL is beneficial to employers. WBL yields useful work for the employer and is a means of recruitment (Kuczera, 2017[36]; Walther, Schweri and Wolter, 2005[37]; Muehlemann, 2016[38]). In 2016, Switzerland estimated that Swiss companies involved in VET programmes enjoyed an average net benefit of CHF 3 170 per apprentice per year (SEFRI, 2019[39]). These companies gained an additional benefit of about CHF 10 700 on average per apprentice if they hired the trained apprentice after completing the apprenticeship. The benefits varied by the firm size, sector and apprenticeship duration. In Sweden, a study evaluating the employer benefits of WBL shows that WBL of 20-40 weeks in total in school-based programmes lasting three years facilitates future recruitment and lowers its cost, and increases the skills and motivation of company staff, especially for those employees who supervise students (Höghielm, 2015[40]; Karlson and Persson, 2014[41]).
- WBL ensures VET provision matches labour market needs. Employer willingness to offer work-based learning is an indicator of their support for the associated vocational programme. Employers can influence the number and mix of places in VET through their willingness to offer workplace training. In programmes dominated by school-based provision, with little or no WBL, the mix of provision may be biased towards the training that schools and colleges can easily provide, based on their existing equipment and teaching staff.

A study by Renold et al. (2016[1]) argues that collaboration between public authorities responsible for education and training and employers yields optimal outcomes, as all the involved parties benefit. Education authorities are best placed to teach as they have access to teachers, curriculum designers, and students. Employers, on the other hand, possess the latest equipment and technology and the most qualified trainers, and can provide students with real world experience (Renold et al., 2016[1]).

When individual VET schools play an active role in reaching out to employers they may need support in developing their links with employers and their capacity to foster WBL. Sometimes this support may come from organised bodies, such as the SBB in the Netherlands (*Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven*). It will often also be helpful for schools to find means to share their experiences. In Finland, a manual has been developed by the Finnish National Board of Education for fostering the transfer of innovative work-based learning practice. Box 2.6 provides further details about the Dutch and Finnish experience.

When employers are reluctant or unable to offer WBL places, the government and social partners may want to promote it through a range of incentives. These incentives include financial incentives such as rewarding employers who train with additional funding or by making employers who do not train to pay. Employers' capacity to train can also be supported with measures other than financial ones. Provision of training requires additional efforts from the employer such as filling administrative duties, organising training on the site, appointing and often training employees who are responsible for trainees. Some employers may not feel able to train students as they lack training capacity. Training capacity depends on the quality of trainers, training methods and training equipment. It is typically less well developed in small companies that do not have dedicated training arrangements hindering their capacity to offer training to students. Figure 2.3 shows that companies with fewer employees are indeed less likely to engage in VET. Small companies may therefore particularly benefit from measures designed to enhance training capacity, such as training for trainers, assistance with administrative work and sharing responsibility for training.

Box 2.6. The role of schools in WBL

The Netherlands: sharing responsibility for WBL between schools and social partners

Responsibility for WBL, including in school-based programmes, in the Netherlands is shared between The Foundation for Cooperation between Vocational Education, Training and the Labour Market (SBB) and VET schools.

The role of the social partners

The Foundation for Cooperation between Vocational Education, Training and the Labour Market (SBB) (*Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven*) is organised in eight 'sector chambers' with social partners and representatives from the VET sector equally represented (ECBO, 2016[42]).

In the Netherlands, all companies offering work placements (both in apprenticeship and school-based programmes) have to be accredited and the accreditation has to be renewed every four years (ECBO, 2016[42]). One of the criteria for accreditation is the availability of a trained supervisor or tutor (*praktijkopleider*). Tutors must be qualified at least at the same level for which he/she is supervising workbased learning. Furthermore, tutors must be able to share their working expertise with students and be pedagogically competent (validated by diplomas/ certificates). In addition, the company has to offer sufficient training opportunities allowing students to develop the skills and competences prescribed in the curriculum. The company has to agree to cooperate with the VET school and workplace tutors have to contact the school on a regular basis. The work environment has to be safe for VET students.

SBB is responsible for maintaining the qualifications for secondary VET, for accreditation and coaching companies offering work placements, and collecting relevant labour market information. SBB also works on themes with a cross-regional and cross-sector focus (Smulders, Cox and Westerhuis, 2016[43]).

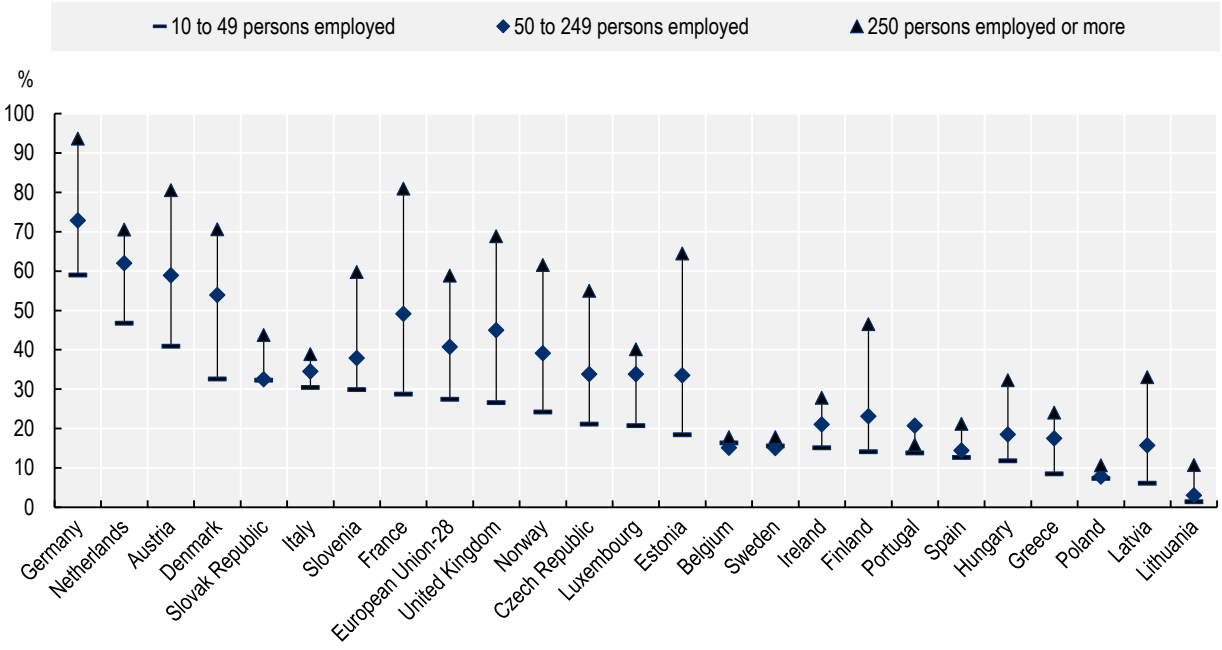
The role of the school

VET schools co-ordinate workplace learning by developing or selecting workplace training course books, the planning of education and training offered in school, and facilitating sessions allowing students to reflect on their work experience. The school also keeps track of student progress by means of regular visits to the workplace (ECBO, 2014[44]).

Finland: Fostering knowledge sharing between VET providers

In August 2010, the Finnish National Board of Education with partners, published a manual for transferring innovative work-based learning practices, designed to help the many providers and stakeholders that are unsure of how to select the most appropriate model of WBL and how to transfer it into their context. The manual is targeted at a range of different audiences including VET providers, colleges, training centres and employers. The manual focuses on the process of transformation and innovation of VET programmes and WBL practices. The manual encourages VET providers to carry out a needs assessment, using measures such as a SWOT analysis and peer review, to identify what needs improvement. It encourages providers to identify good practice in other providers by identifying those aspects that are not-context dependent and can be transferred. The manual also offers practical examples of how a VET school (as an illustration) can identify where improvements to WBL are required, how to plan to make such improvements and how to deal with changes that have been made (Väyrynen, 2010[45]).

Figure 2.3. Share of employers engaged in the provision of initial VET, by firm size, 2015



Note: Initial Vocational Education and Training within enterprises is defined as a formal education programme (or a component of it) where working time alternates between periods of education and training at the workplace and in educational institutions or training centres. The survey covers enterprises with at least 10 or more employed persons for all sectors excepts agriculture and related, public administration, education, and health and social work.
Source: Eurostat (2023[46]), Continuing Vocational Training in Enterprises, Enterprises employing IVT participants by size class - % of all enterprise, (TRNG_CVT_34S), https://ec.europa.eu/eurostat/cache/metadata/en/trng_cvt_esms.htm.

To ensure that training in firms is beneficial to students, regulations can define the competencies that students should develop, how work-based learning should be delivered, qualifications of VET teachers in schools and trainers of learners in companies. The regulations and WBL standards are more important in programmes with longer periods of WBL as that is where students spend most of their time. While regulations ensure WBL develops in students the required skills, they may impose additional burden on employers and discourage them from offering training to students. Countries apply different approaches to the quality control of WBL. In Denmark, the Netherlands and Norway, for example, bodies involving social partners set up the standards and assure the quality of WBL. In some countries VET schools play a more active role in the delivery and quality control of WBL. For example, in Estonia, the school designs a plan for apprenticeship study and may also set up an individualised curriculum for the apprentice (Estonian Ministry of Education and Research, 2017[47]). In Sweden, similarly to Estonia, only recently work-based learning has been promoted and expanded in upper-secondary VET, and schools play an important role in arranging and supervising work placements with companies (Ministry of Education Sweden, 2018[31]).

Supporting companies with the training of trainers

Trainers in companies, who are typically company employees, are at the forefront of education and training as they are in charge of conveying knowledge and developing skills in trainees. In general, in-company trainers are expected to have a relevant education background and work experience. In Canada, Denmark, the Netherlands and Norway, for example, trainers are expected to have a relevant vocational qualification and several years of relevant work experience. In Norway, the company needs to appoint a training supervisor who bears the overall responsibility of the apprenticeship as well as one or more trainers. A few countries also require in-company trainers to have a specific education or training related to their training duties. In Germany and Switzerland, for example, there are specific requirements regarding a training

qualification to ensure trainers have the necessary teaching skill. In Germany, trainers must have a relevant professional qualification and pass a trainer aptitude examination to demonstrate one's vocational and pedagogical knowledge. Training companies need to be accredited in order to offer work-based learning for VET students and they must have at least one 'qualified' trainer (i.e. a trainer who passed the trainer aptitude examination). In Switzerland, trainers at companies providing apprenticeships have to have a special qualification that is awarded upon attending 100 hours of training in pedagogy, VET law, VET system knowledge, and problem-solving methods for adolescents. VET trainers for intercompany courses have to complete 600 hours of pedagogy preparation and there are also special requirement for examiners (Hoeckel, Field and Grubb, 2009[48]).

Many countries provide access to training by trainers without making it mandatory. Governments may also facilitate networking among employers to share knowledge and experience on how best to support, develop and make use of the skills of learners. Box 2.7 provides examples of initiatives targeting training of trainers.

Box 2.7. Skills development for in-company trainers

Estonia

In Estonia, VET teachers are responsible for the training of in-company trainers. They organise seminars and training courses, supervise and support in-company trainers. The purpose of the training is to raise the quality of supervision during work placement and the efficiency of such training. The course is between 8 to 40 academic hours long and participants receive a certificate. Training topics are about preparing, administering and evaluating work practice, and include for example didactics, supervision and training provision; curriculum objectives and assessment principles; work practice and supervision for special education needs students. In the past, VET institutions could apply for additional funding to develop training of trainers (Estonian Ministry of Education and Research, 2017[47]).

Norway

The Norwegian Directorate for Education offers free resources for apprentice instructors on their website, including short movies showing how instruction can be carried out in practice (Utdanningsdirektoratet, 2011[49]; Utdanningsdirektoratet, 2022[50]).

Denmark

In Denmark, trainers can participate on a voluntary basis in adult vocational training courses (AMU) that help them in their trainer role (Appretniceship toolbox, 2019[51]) The course duration varies from one day to a couple of weeks. These AMU-courses are primarily used in the social and healthcare sector. AMU-courses that can prepare trainers for their role provide training on various aspects of apprenticeship, including, how to organise and provide work-based training, motivate students and ensure quality of the training. For example, a course for trainers who work with students who have special needs lasts five days. During the course trainers learn about youth culture, including young people's different values and norms, and how to support and motivate the individual student's professional and personal development taking into account the student's special academic, linguistic, personal, social and learning competencies. Adult vocational training programmes (AMU) are partially publicly funded (OECD, 2022[52]).

England (UK)

Within the English context, a guide prepared by the Chartered Institute of Personnel and Development (CIPD) offers a range of advice to employers on best practice in mentoring and developing apprentices – but its use is almost entirely voluntary (CIPD, 2021[53]).

Companies working together to provide training

To support employers that on their own would not be able to deliver WBL, many countries have arrangements that allow employers to share responsibility for it. Small companies may particularly benefit from such measures, as they are less able to benefit from the economies of scale that can reduce the unit cost of apprenticeship training. Such economies are realised when, for example, a trained instructor provides training to a few students at the same time, or the company bears the fixed cost of understanding the administrative and other requirements associated with apprenticeship. Small companies may also be unable to train for the full range of skills required by a specific qualification, which is particularly important in apprenticeships.

Examples discussed below are mainly for apprenticeship but they can be easily transposed in the context of WBL of shorter duration. In Germany "apprenticeship sharing" includes the following models (Poulsen and Eberhardt, 2016):

- Lead enterprise with partner enterprise model: the lead enterprise bears the overall responsibility for training, but parts of the training are conducted in various partner enterprises.
- "Training consortium" model: several small enterprises work together and take on trainees.
- "Training association" model: the individual enterprises establish an organisation for the purpose of the training that takes over the organisational tasks (contracts, etc.), while the master enterprises offer the training. The organs of the association are the general meeting and the honorary committee. A statute regulates rights and obligations of the members.

In Austria, companies that cannot fulfil certain standards (for instance because they are too small or too specialised to provide their apprentices with required training) may form training alliances (*Ausbildungsverbünde*) to share apprentices. Alliances of training firms are supervised at the state level by the Apprenticeship Offices (*Lehrlingsstellen*) appointed by Economic Chambers. The Economic Chambers help to find partners for firms willing to create new training alliances. Lachmayr and Dornmayr (2008[54]) show that training alliances help to improve the quality of apprenticeship provision. In 2008, at least 5 000 training firms, or 15 000 apprentices, were organised in training alliances.

In Norway, Apprenticeship Training Agencies (ATA) (*opplæringskontor*) are owned by companies and aim to establish new apprenticeship places, supervise companies with apprentices, train staff involved in the instruction of apprentices, provide career guidance and recruit apprentices. Many ATAs organise the theoretical part of apprentices' training. While county authorities must approve each individual company with apprentices, ATAs often sign the apprenticeship contracts on behalf of enterprises providing apprenticeship, thereby becoming accountable for completion of the apprenticeship and its results. About 70-80% of companies with apprentices are associated with ATAs. These bodies are indirectly funded by the state, as typically companies pay half of the amount received from the state for apprenticeship training to ATAs. The prices of ATA services are set in an agreement between ATAs and the member companies (Kuczera, 2017[55]). Recent reforms as part of the new Education Act (June 2023)[3] have brought changes to the ATAs, which are now called "samarbeidsorgan for lærebedrifter (opplæringskontor)" in the law. The ATAs can now be part of the apprenticeship contract, and they can receive funding on behalf of the apprenticeship enterprise.

Financial incentives for employers to provide work-based learning

Several countries provide financial incentives to encourage and support employers to provide work-based learning to VET students. Such incentives can come directly from the public purse (e.g. tax breaks and subsidies), flow from VET schools to employers, or take the shape of a training levy on employers.

First, the cost of financial incentives for companies to offer training can come out of general public expenditure, and therefore from taxpayers, as: 1) a reduction in the tax base or tax due by companies providing apprenticeships; or 2) a subsidy to firms with apprentices. These incentives are mainly targeted

at companies providing apprenticeships as they incur a much higher cost than companies providing shorter work placements for students. Often they include an element of targeting, e.g. focussing on SMEs or on specific sectors or learners. Some examples include:

- In Austria, tax incentives were abolished in 2008 and replaced by direct subsidies for apprenticeships. The Ministry of Economics and Labour considered the tax incentive scheme failed to target companies that would benefit most from additional support for apprenticeships (Cedefop, 2011[56]). Since 2016, every training company gets a direct public subsidy for each apprentice. This basic subsidisation is linked to the apprenticeship wage and is gradually reduced over time to compensate for the low productivity of apprentices in initial years. Criteria-based subsidies in Austria intend to increase quality (e.g. coaching, building training alliances, providing extra preparation for the final examination or the qualifications of trainers), and/or foster provision for specific target groups (e.g. by employing apprentices from supra-company scheme). Companies must apply at their local apprenticeship office, provide proof of their expenses, and will get them partly reimbursed up to a certain amount. Finally, employers have non-labour costs related to apprenticeships (such as social security contributions, unemployment and insurance), waived.
- The Slovak Republic introduced a new form of dual education in initial VET in 2015. WBL accounts for approximately 60% of the programme duration, with VET schools providing theoretical education. Tax incentives are provided to companies offering dual education, with the amount of the tax benefit for the entire period of study depending on the programme duration. Employers meeting certain requirements can claim EUR 9 600 and EUR 12 800 of tax benefit for a 3-year and 4-year studies, respectively (BusinessEurope, 2016[57]). Dual education has expanded over time[4] (Slovakia State Institute of Vocational Education and Training, 2019[58]), however, it is unclear if the subsidy contributed to the increase in apprenticeship provision by employers as the effect of the subsidy has not been evaluated.
- France provides subsidies for companies employing apprentices. The subsidy equals EUR 6 000, which employers receive in the first year of the apprenticeship. While no conditions apply to employers with less than 250 employees, larger companies can only receive the subsidy if they have at least a specific share (3-5%) of apprentices among their workforce.
- In Türkiye, apprentices and VET students in other forms of work-based learning receive a salary of at least one-third of the national minimum wage (increasing to 50% for apprentices in their final year, i.e. grade 12). In the case of apprenticeships, the entire wage is subsidised by the government in the form of state support to the enterprise. In the case of work-based learning for VET learners in Vocational and Technical Anatolian High Schools,[5] one-third of the salary is subsidised by the government (and the rest is covered by the enterprise). This goes up to two-thirds of the salary in enterprises employing less than 20 employees.
- In Ireland, subsidies target gender imbalances in apprenticeships. Employers who recruit female craft apprentices are eligible for a EUR 2 667 bursary per female apprentice registered. This female craft apprenticeship bursary has recently been expanded to all programmes with greater than 80% representation of a single gender.
- During the COVID-19 pandemic, some countries provided additional support to firms with apprentices. Germany, which does not provide subsidies to firms offering apprenticeship on a regular basis, put in place a temporary financial scheme “Secure apprenticeships”. It targeted small and medium-sized companies that were particularly affected by the crisis to maintain or even increase their level of training. In 2021 only, the country disbursed EUR 500 million for this purpose.

Second, some countries transfer funds that would otherwise be channelled to schools to employers with WBL opportunities - in recognition of the role of employers in education and training of young people. For example, in Norway, apprenticeships are part of upper-secondary VET (which starts for most learners at age 16) and they are typically organised on a 2+2 basis, with learners spending the first two years in

full-time school-based education and the last two years in full-time work-based learning (Utdanningsdirektoratet, 2020[59]). As such, these programmes are one year longer than most other upper-secondary programmes (which last three years). However, public funding for the apprenticeship programme is in line with other three-year programmes: the state funds the two years of school-based education and provides grants to employers who train apprentices of an amount approximately equivalent to one year of school-based education. As such, this model allocates resources from schools to firms without increasing the total cost of provision. It is thus a special type of subsidy based on the cost of VET provision (Cedefop, 2019[60]). In countries without a tradition of employer engagement in VET, schools sometimes play a more active role in initiating and organising work placements and sometimes in funding. In Estonia, for example, the school finances the training at school, supervisors' training and salary for the school supervisor. Based on the apprenticeship contract between the school, the company and the student, the school can transfer up to 50% of the funding for the cost of the study place to the enterprise to cover the salary cost of workplace supervisors (Estonian Ministry of Education and Research, 2017[47]).

Third, the costs of financial incentives can also fall on employers, with either all employers or some employers contributing, typically through a levy on turnover or payroll. Under levy schemes, funds from contributions may be used to support VET or training more broadly. Levy training funds can span across all sectors at a national and regional level. They can also be set up to address skills needs of a specific sector (or a few sectors). For example, in Denmark and France, all employers share the costs of apprenticeships, while in England (United Kingdom), only large employers contribute. In Austria, Brazil (Box 2.8), Germany and Switzerland, levies are collected by sector.

Box 2.8. The Brazilian training levy scheme

Brazil has well established sectoral levy funds, whereby firms from the sector share responsibility for training. The scheme has been in place since 1940s. Contribution rates for the levy-scheme are different across sector of activity.

Similar to some other Latin American countries (INA in Costa Rica, INATEC in Nicaragua, SNPP in Paraguay, SENATI in Peru), in Brazil sectoral associations, called Sistema S, established their own training facilities to train their workers and future recruits. The Brazilian Sistema S is a group of 10 non-profit private institutions specific to an economical sector and carrying out activities of public interest. Two of the Sistema S institutions, SENAI (National Service of Industrial Education) and SENAC (National Commercial Training Service), cater to 38% of the VET students enrolled in private institutions. A significant share of their revenue comes from the levy funds (Souza et al., 2015[61]).

Employer perception of the training levy funds in Brazil is positive. Employers consider that their employees educated by SENAC perform well at work: 95% of Brazilian companies that hired people trained by SENAI were satisfied. SENAC and SENAI also conduct studies to evaluate the effect of training on employability of their graduates. More than 90% of SENAC graduates feel more prepared to perform their activities after completing the course and 80% have improved their career options; 73% of people trained through SENAI found a job within one year of training completion. Given that the existing training levy funds seem to function relatively well, professional organisations running them should be included in the discussions on how to expand provision of initial VET (OECD, 2022[62]).

Levy training funds are often set up to correct market failures by spreading the cost of training across a large group of employers and decreasing the individual employer's risk of investing in training. For example, employers do not provide training because they fear that the workers they train will be recruited by other employers and they will not be able to recoup their investment. Training levies thus support training that is in the collective interest of employers and society. Employers benefit from a well-trained pool of potential recruits and should therefore contribute to the cost of the training (rather than, or in addition to, contributions from general taxation). Levy funds can also be used to reduce inequalities by targeting

training of disadvantaged populations, or support of small employers in the informal economy (UNESCO, 2022[63]). Overall, the effectiveness of the levy fund and employers' support of the fund depends on how it is designed, managed and evaluated. Employers tend to be more sceptical of universal levy schemes, often perceived by as a tax (UNESCO, 2022[63]; Müller and Behringer, 2012[64]). Levy training funds receive limited support from employers when the funds are diverted to purposes other than training, and when employers (and in some cases social partners) have little control over how the money is spent. Palmer (2022[63]) argues that some cross-subsidisation of non-levy payers can be beneficial (e.g. funding of training in small enterprises). However, too much cross-subsidisation may result in disengagement of the levy paying companies with the scheme. For example, levy payers may consider that their contribution is wasted if funds are diverted to low quality initial VET where the provision is driven by school capacity (e.g. available equipment and VET teachers) rather employers' needs.

As argued by Palmer (2022[63]), evidence on training levy funds is too scarce to draw conclusions on their effectiveness. Westergaard and Rasmussen (1999[65]) found a significant positive effect of public subsidies in Danish firms, but only in manufacturing, business and retail. In Austria, subsidies appear to have had a limited impact (Wacker, 2007[66]). In Switzerland (where there are no subsidies of this type), a simulation exercise suggested that subsidies would have an impact on firms not involved in apprenticeships, but would have no effect on the supply of apprenticeship training in firms that train already (Muehlemann, 2016[38]). An evaluation of the Australian scheme shows that the subsidy had only a small impact on the decision of employers to train. This was mainly because the subsidy covered only a small part of the company cost of offering an apprenticeship (Deloitte, 2012[67]). Another Australian study evaluates the impact of the withdrawal of a subsidy on employers (Pfeifer, 2016[68]), showing that it had no effect on employers using apprenticeships as a recruitment tool. However, the withdrawal of the subsidy led to a decline in apprenticeship provision in sectors where employers could not count on the long-term benefits of apprenticeships. These employers were not able to break even by the end of the programme without the subsidy. Muehlemann (2016[38]) argues that in Australia the reduction in apprenticeships was particularly strong in the service sector, where the quality of apprenticeship provided was often low (as measured by graduation rates and employment outcomes). The subsidy may therefore have been promoting apprenticeships that were of limited value to individuals.

The overall implication is that financial subsidies will typically involve a significant amount of "deadweight", i.e. training that employers would have funded anyway, even in the absence of the relevant incentive. Some element of deadweight is inevitable, usually the objective is to minimise its scale so that incentives increase the number of trainees. A further risk is that financial incentives may succeed in engaging employers who are primarily interested in the subsidy, rather than in training. Countries where employers have not been traditionally involved in training of students are more likely to subsidise employer provision of work placements.

Large employers tend to benefit disproportionately from financial incentives (Müller and Behringer, 2012[64]). For employers to benefit from the subsidy they need to be informed about the scheme, e.g. on the existence of the measures, the criteria of eligibility, and procedures of application. Access to accurate and timely information may be easier for larger employers that often have training departments and staff dedicated to training issues. The provision of training and the use of subsidies also involves costs. The cost of these procedures may be less significant for bigger enterprises, relative to their overall training costs. Small enterprises may lack the capacity to determine training needs, plan accordingly and file applications for cost reimbursement or grants. It is therefore important to assist small companies with access to and the processing of available funding in parallel to providing financial incentives for training (as discussed above).

How can higher vocational and professional tertiary education programmes satisfy the demand for higher-level professional skills?

Medium-term projection exercises, including for the European Union (EU), Canada and the United States, suggest that employment growth in some of the common occupations for VET graduates will be modest or even negative in the coming decade(s). This is especially the case for craft and related trades occupations, which have already seen declining employment relative to other occupations in recent years. By contrast, employment levels are projected to continue to grow in high-skill occupations (professionals and technicians). According to projections from Cedefop and Eurostat (2018[69]), the sectors that are projected to have the strongest employment growth in the EU in the period 2016-2030 are R&D, consulting services, computer programming and advanced manufacturing. Managers, service and sales workers, and elementary occupations will also experience growth, but at a slower pace. Employment levels are projected to go down for craft and related trades workers, clerks and skilled agricultural workers. These changes imply that there is an increased need for higher-level professionally oriented qualifications and for easy pathways between medium-level VET and these higher-level qualifications. Higher level professionally oriented programmes include those at postsecondary, short-cycle tertiary and bachelor's level, and some countries also identify some programmes at master's level as "professional" (i.e. levels 5 and above in the International Standard Classification of Education, ISCED). In addition to helping meet the demand for high-level skills, effective learning pathways can help increase the attractiveness of VET, support lifelong learning, reduce inequalities and promote social inclusion and mobility (Field and Guez, 2018[70]).

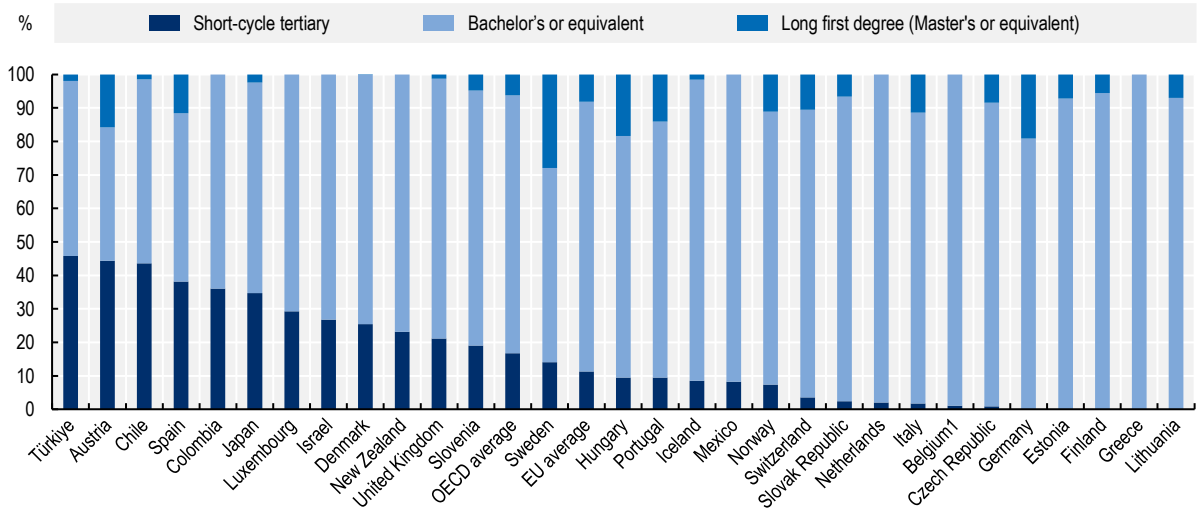
Providing a diverse offer of professionally-oriented programmes at the tertiary education level

Professionally-oriented programmes at different levels

At short-cycle tertiary level, a wide range of qualifications exist across OECD countries. Many countries offer associate degrees or short higher vocational programmes, like for example associate degrees taught in universities of applied science in the Flemish Community of Belgium, associate degrees (BES qualifications) in the French Community of Belgium, Higher National Qualifications and foundation degrees in the United Kingdom, and college diplomas in Canada. Business academies in Denmark, and higher vocational programmes in Norway and Sweden offer an opportunity for upper secondary VET graduates to acquire advanced technical skills. Some programmes are closely connected to upper secondary education and are provided within the same institutions as upper secondary VET programmes. For example, in Austria year 4 and 5 of *Berufsbildende höhere Schulen* (BHS) programmes follow-up on three-year upper-secondary programmes and are delivered within the same colleges. In countries like Austria, Chile, Colombia, Japan, Spain and the Republic of Türkiye, over one third of new entrants into tertiary education enter at the short-cycle level (Figure 2.4). There are sometimes articulation arrangements between short-cycle tertiary programmes and bachelor-level programmes. For example, in Denmark some business academy programmes allow graduates to continue to a 1.5 year top-up programme to obtain a professional bachelor's degree. In the United Kingdom, those who hold a Higher National Certificate may enter the second year of a degree programme (while those holding a Higher National Diploma can enter the third year of a degree programme).

Figure 2.4. Entrants into tertiary education programmes, by programme type

Distribution of new entrants by tertiary level



1. Data for Belgium for short-cycle tertiary programmes refer to the Flemish Community only.
Source: OECD (2020[34]), *Education at a Glance 2020*, Figure B4.2, https://doi.org/10.1787/69096873-en.

At bachelor's level, it is harder to describe the international landscape due to the lack of internationally agreed definitions.[6] Around half of OECD countries do not report data by programme orientation at this level due to various potential reasons (because the distinction is less relevant to their system, it is difficult to implement because they have a unified tertiary system, or because they prefer not to report a distinction that is possible ambiguous given the absence of agreed definitions). Several countries have established designated professional bachelor's programmes, which involve professional training through a bachelor's degree (see Box 2.9 for some examples). They are often taught in dedicated institutions, such as universities of applied sciences or university colleges. They have seen rapid growth in several countries, where enrolment now rivals or exceeds the level of academic bachelor's degrees (e.g. Belgium, the Netherlands). While some programmes prepare for a single occupation (e.g. nurse, teacher), many take as their point of departure the applications of a particular type of science – for example food technology or business management. This means that they provide the knowledge and skills associated with a family of professions or a particular sector, linked to the application of that type of science.

Professional examinations are a distinct form of professional qualifications. One of their key characteristics is that they usually do not require any specific programme of preparation, although having several years of relevant work experience is a common requirement. In several countries such examinations are led by industry at the national level, leading to a qualification that is standardised and unique across the country. Examinations have traditionally led to *meister* or master craftsman qualifications for traditional VET occupations, preparing for example qualified electricians and plumbers to run their own business and train apprentices. Mirroring developments within the VET system, qualifications have diversified in terms of targeted sectors and are now available in sectors like healthcare, ICT and finance. Depending on the country and target occupation, the qualifications obtained are equivalent to a short-cycle tertiary degree, bachelor's or master's qualification. For example, in Austria VET graduates may prepare for the examination in a *Meisterschule* and obtain an ISCED 5 qualification. At the same level, Germany offers meister qualifications in a range of occupations (e.g. optician, plumber, heating engineer). Equivalent to bachelor's degrees, in Germany examples of professional examinations at ISCED level 6 include mechatronics meisters or certified accountants. In Switzerland, most professional examinations are situated at this level and examples of qualifications include audiprothesists, international trade experts or cyber security specialists.

Box 2.9. Professional bachelor's programmes

Denmark

Professional bachelor's programmes are typically provided by university colleges and some business academies, and take three or four years to complete. Most programmes lead to public-sector employment as teacher, nurse or social worker, but programmes are also offered in engineering, information technology, business and media and communication, targeting private sector jobs. Work-based learning is mandatory and accounts for about a quarter of the programme.

Latvia

Professional bachelor's programmes may be delivered by universities or university colleges. Their content must be designed according to approved professional standards established at national level. These standards are developed by expert groups, including employers and experts in the relevant field. Fields of study include management and administration, teacher training, ICT, travel, tourism and leisure, elderly care, social work and engineering trades. All programmes include a mandatory internship or one semester of practice.

Slovenia

Professional first cycle study programmes provide students with the skills and expertise to apply scientific methods to the resolution of complex professional problems. Practical training in a working environment is mandatory. These study programs are based on legislation designed to implement reforms linked to the Bologna process. They take three to four years to complete and consist of 180 to 240 ECTS (European Credit Transfer and Accumulation System), similarly to academic first cycle programmes. They may be offered by universities, academies or professional colleges.

Source: OECD (2022[71]), *Pathways to Professions: Understanding Higher Vocational and Professional Tertiary Education Systems*, https://doi.org/10.1787/a81152f4-en.

Different functions of professionally-oriented tertiary programmes

Postsecondary or tertiary programmes with a professional orientation may play different functions in national skills systems. These different functions are associated with different patterns regarding the age of students, the use of part-time participation, both across countries and between programmes within individual countries.

Younger adults dominate in programmes providing initial preparation for labour market entry. Programmes are designed to equip recent upper secondary graduates with occupational skills. Short-cycle tertiary programmes in Austria, France, Italy and Slovenia usually play this role. Similarly, professional bachelor's programmes across various European countries (e.g. Belgium, France, Lithuania and Slovenia) tend to enrol young adults and prepare them for a first skilled job.

Older adults dominate in programmes offering other functions, including:

- Upskilling for existing professionals: Programmes build on a relevant prior vocational qualification and several years of relevant work experience. Students often combine studies with employment in a relevant sector. For example, professional examinations in Germany and Switzerland often have this function.

- Reskilling for adults:[7] Programmes are used to support a career shift. While students may have work experience and work part-time, their employment is not necessarily related to the targeted field of study. A programme may serve as a tool for reskilling if it does not require relevant work experience – instead participants may obtain such experience during their studies through work-based learning. For example, in Denmark professional programmes may be pursued full time (with an internship) or part time for those with relevant work experience.

Making higher vocational and professional tertiary education programmes accessible and relevant

Creating strong linkages with employers

Close connections with the world of work are important for all tertiary programmes, especially for programmes with professional orientation. A series of case studies of professional tertiary education in Europe found that strong links with social partners represents one of the strengths of this sector. Strong employer engagement appears to be facilitated by looser regulation compared to upper secondary VET, making it easier to adapt provision to changing needs, and employer interest in the type of skills provided by this sector (Ulicna, Luomi Messerer and Auzinger, 2016[72]).

As described in the previous section, the institutional framework underpinning employer engagement typically includes bodies at national and regional level (sometimes involving different bodies for different economic sectors) and/or at the level of individual institutions. For higher vocational and professional tertiary education, advisory committees at the national (or sectoral) level commonly include social partners and provide strategic guidance regarding policy development and implementation in the light of skills needs. Examples include the Advisory Council for Technical Professional Training in Chile, the Assembly of Councillors of state-owned higher education institutions in Estonia, National Professional Advisory Commissions in France, the National Council of Vocational College Education in Norway, the Council for Vocational and Professional Education in Slovenia, and the General Council for VET and Regional Councils for VET in Spain. Several countries also require individual institutions to have systematic engagement with employers through institutional education boards or committees. For example, in France employers are members of higher education institution boards, in Denmark each provider institution is required to have employer panels or education committees with labour market knowledge and in Estonia institutions must include employers in the committees associated with each study programme.

Primarily at national level, but also sometimes regionally, most countries report systematic involvement of social partners in the development and updating of higher vocational or professional tertiary education programmes and curricula, through their involvement in advisory bodies such as those set out above and/or accreditation criteria, which require support from social partners for the proposed programmes and curricula. For example, in the Czech Republic the Accreditation Commission for Tertiary Professional Education includes representatives of the world of work and in Luxembourg accreditation committees are composed of 50% national experts or professionals and 50% international experts in quality assurance. At a more local level, employers and practising professionals also often play an important role in the delivery of professional programmes. Several countries report that professionals often work as regular teaching staff or guest lecturers (e.g. France, Israel, Italy, Luxembourg, Norway). Spain has a specific category of teaching staff, “specialist teachers”: these are experienced practitioners who completed some pedagogical training and teach certain modules part-time. In addition, Spain also encourages teachers to regularly pursue job-shadowing for short periods of time to update their technical skills. More directly, employers may also deliver training themselves through work-based learning, when they host interns or apprentices. They may also support their employees (financially and/or by granting them release from work) who pursue part-time programmes.

Finally, in some countries industry representatives take an active role in the design and delivery of final assessments. Their engagement is fundamental in professional examinations – in Switzerland, employers are involved through their professional organisations, which set up examination regulations and employers participate in examinations as examiners. In other types of professional programmes (not professional examinations), industry representatives are less often involved. In Italy, they are systematically engaged, as the final assessments of courses in higher technical institutes are led by examination boards that include experts from the world of work. In addition, a few other countries report that employers may participate in assessments – such as in examination boards in tertiary professional programmes in the Czech Republic.

Using work-based learning

In all types and levels of programmes designed to prepare for the labour market, work-based learning is a powerful way of aligning the content of programmes with labour market needs, developing both technical and broader employability skills and connecting learners with potential employers (as described in the previous section). One important difference with upper secondary VET, which in most countries tend to serve young people in initial education, is that higher vocational and professional programmes engage a more diverse group of learners. Some programmes are specifically designed for adults with several years of work experience (e.g. professional examinations often require relevant experience). Part-time programmes commonly enrol students who work part-time, often in a related occupation. As a result, past work experience sometimes replaces the work-based learning component in some programmes, or coursework may build on past or ongoing work experience. At the same time, there is often a need to include an element of work-based learning in programmes. In some countries and programmes a large share of learners are young and have little or no work experience. Others might have held previous jobs, but seek a career change and therefore need to acquire work experience in their new chosen occupation.

The development of work-based learning has been highlighted as one of the main trends shaping the professional tertiary landscape in Europe (Ulicna, Luomi Messerer and Auzinger, 2016[72]). Yet various barriers mean that not all professional programmes make effective use of work-based learning. For employers, providing high-quality work-based learning is demanding, requiring the capacity to manage partially skilled workers and integrate them into work processes, as well as dealing with the associated administrative burden. There are often barriers on the education provider side too, as integrating work-based learning into programmes requires a different organisation of the learning process and different ways of assessing learning outcomes. As a result of these barriers, work placements are sometimes optional additions to programmes or lack quality assurance.

In short-cycle tertiary education work-based learning is very common, either a mandatory component for all students, or more selectively, in some programmes and for some of the students (see OECD (2022[71]) for details by country). Several countries have made work-based learning mandatory for all students and specify its minimum duration. Associate degrees in Belgium (both French and Flemish community) include at least a third of the programme spent in work-based learning. In Denmark full-time business academy programmes include a mandatory internship, while in part-time programmes there is no work placement but relevant work experience is an entry requirement and programmes build on it. In France short-cycle tertiary programmes either include a mandatory internship or may be pursued via a dual pathway with alternating periods of school-based and work-based learning. Many other countries use work-based learning in short-cycle tertiary programmes, but not necessarily in all programmes and by all provider institutions.

At bachelor's level, the use of mandatory work-based learning is less common (see OECD (2022[71]) for details by country). Work-based learning is systematically used in professional bachelor's programmes in Denmark, bachelor of technology or professional bachelor's programmes in France (which may also be pursued through dual training), professional examinations in Germany, professional examinations and professional education and training (PET) colleges in Switzerland, professional higher education in

Slovenia (though its duration may account for less than 25%) and higher VET in Spain. Many countries report using work-based learning but not for all students, with some variation across programmes and provider institutions. Some countries have also introduced apprenticeships at the bachelor's (and/or short-cycle tertiary) education level. This is the case, for example for graduate apprenticeships in Scotland (United Kingdom) (levels 8 – 10 in the Scottish qualifications framework, equivalent to ISCED levels 5 - 7) (OECD, 2022[73]), as well as degree apprenticeships in England (United Kingdom) (levels 6 and 7 in the English qualification framework, equivalent to ISCED levels 6 and 7). In some cases, this has allowed the expansion of apprenticeship to new sectors or fields, see Box 2.10 for an example of cybersecurity apprenticeship in England (United Kingdom).

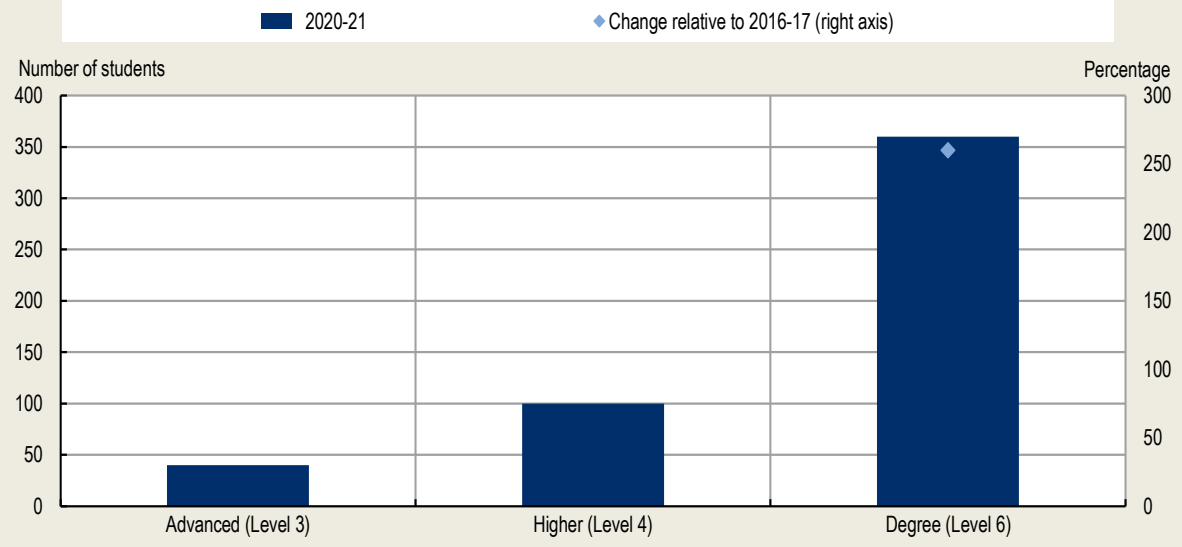
Box 2.10. Cybersecurity apprenticeships in England (United Kingdom)

There are three cyber security apprenticeship qualifications approved: Cyber security technician at Level 3 (consistent with ISCED level 3), cyber security technologist at level 4 (ISCED level 5), and cyber security technical professional at level 6 (ISCED level 6). They were introduced for the first time in 2014. Most apprentices participate in higher-level programmes (level 6), see Figure 2.5. Enrolment in apprenticeships increased strongly in the last five years (Figure 2.5). Nonetheless, the absolute numbers remain relatively low – especially at the lowest level.

Further Education (FE) providers and Higher Education (HE) institutions provide the off-the-job component of the apprenticeship. Academic entrance requirements to apprenticeships are broadly similar to those of classroom-based FE or HE programmes, with typically additional criteria added by employers as part of the recruitment process.

Figure 2.5. Apprenticeships starts in cyber security in England (United Kingdom) by the level of qualification

Number of apprenticeship starts in cyber security in 2016-17 and 2020-21



Note: Advanced and Higher apprenticeships in cyber security have only been on offer since 2018-19. The term 'starts' refer to number of new people starting an apprenticeship each year.
Source: UK Government (2022[74]), Education statistics: 'Subjects and levels - detailed series' from 'Apprenticeships and traineeships', https://explore-education-statistics.service.gov.uk/data-tables/permalink/765f8afa-19b3-4fb3-c74d-08dac7ae389f.

Employers work with the Institute for Apprenticeships to create and develop occupational standards, which describe duties and 'Knowledge, Skills and Behaviours'. For instance, IfATE approved the 2021 'cyber security technologist', a level 4 apprenticeship standard, which involved the participation of multiples employers such as QineitQ (i.e. high-tech company focused on defence), Siemens (i.e. company focused on industry, infrastructure, transport, and healthcare), FoxRedRisk (i.e. Information Security and Data Protection consultancy), as well as the DCMS (IfATE, 2021[75]). In 2018, Global Knowledge UK, a worldwide leader in IT and professional training, in partnership with relevant cyber security players, including QUFaro (i.e. IT training provider) and GKA (i.e. IT and business training provider), collectively formed a trailblazer group for creating a level 3 apprenticeship standard to address the need for a broader choice of qualifications to fulfil the skills gap in the cyber security profession and meet the demands of employers (Global Knowledge, 2018[76]).

Source: OECD (2023[77]), *Building a Skilled Cyber Security Workforce in Five Countries: Insights from Australia, Canada, New Zealand, United Kingdom, and United States*, https://doi.org/10.1787/5fd44e6c-en.

How can VET teachers be equipped with the right skills?

Responsive VET systems that adapt to the needs of the labour market also require teachers who have up to date knowledge and skills. VET teachers require multiple layers of skills and experience: they need to have both theoretical and practical knowledge and skills and have the capacity to effectively transfer their knowledge and skills to students. VET teachers usually acquire their knowledge and skills through years of study and practice, leading to a VET teaching qualification. Most VET teachers have a tertiary degree, although in most OECD countries their level of attainment is lower compared to general education teachers. However, the majority of countries require VET teachers to have teaching qualifications of at least ISCED level 5 (short-cycle tertiary) or above (OECD, 2021[78]).

Given that students in VET are often very diverse (see Chapter 3) – including young people in initial education and adults who are upskilling or reskilling – VET teachers also need to be able to work with students with very different backgrounds, motivations and aspirations. Often VET attracts learners who are more interested in practical skills rather than academic study, who are not motivated by traditional forms of teaching and learning, or who are at risk of dropout – VET teachers need the pedagogical knowledge and skills to effectively engage with these learners. In many countries, learners in VET have weaker basic skills – such as literacy or numeracy – than those in general education, and thus VET teachers need to be able to identify possible basic skills gaps, contribute to closing them and engage strong performers. Moreover, VET teachers increasingly need to develop transversal skills in their students, as these are in growing demand in the labour market (see Chapter 4). To do this, teachers need to have knowledge of innovative pedagogical approaches that foster the development of these skills (as discussed in Chapter 5). They also need to have strong digital skills themselves, to be able to use new technologies in teaching and training and remain up to speed with technological innovations in the workplace (OECD, 2021[78]).

Attracting industry professionals to the teaching profession

Many countries struggle to attract and retain VET teachers with relevant skills, which has translated into significant shortages. Despite a lack of comparative data, evidence suggests that several OECD countries or several fields are facing VET teacher shortages. An ageing VET teacher population could reinforce existing shortages in the coming years if the supply of new teachers does not increase. Teacher shortages may hamper the sustainable provision of VET, especially if they result in an increased reliance on teachers who are not well prepared for their role or a reduced VET offer (OECD, 2021[78]).

One strategy to avoid or overcome VET teacher shortages is attracting industry professionals to teach in VET. These industry professionals can bring practical skills and up-to-date industry knowledge to the classroom and strengthen co-operation between VET systems and the world of work. However, they often lack the necessary teaching qualifications and pedagogical skills, and therefore need access to flexible qualification and training opportunities. Moreover, flexible working arrangements could also make it easier for industry professionals to combine their job in industry with teaching responsibilities in VET (OECD, 2021[78]).

Relaxed entry qualification requirements can smooth the path from industry into teaching in VET but should not come at the expense of quality. Several countries attract industry professionals to enter the teaching profession without the required teaching qualification, but still require or encourage them to obtain the qualification afterwards. Relaxing entry qualification requirements for industry professionals can be particularly helpful in fields for which no relevant teaching qualification or training for VET teachers exist yet, to meet rapidly changing labour market demand (OECD, 2021[78]). In the Netherlands, for example, 'Lateral entry' (*zij-instroom*) into the teaching profession allow individuals coming from another profession (or another subject) to teach in VET – provided that they complete a shortened teacher training within a certain period (typically the Pedagogical didactic certificate, PDG) and are deemed suitable for the teaching profession (OECD, 2022[52]). Industry professionals hired through the PDG route are generally well regarded and considered as key players in VET, especially to bring in industry expertise and to prepare teachers for those VET programmes for which no dedicated regular teacher qualification exists (Regioplan/ECBO/ROA, 2021[79]).

Moreover, flexibility and support to help industry professionals obtain necessary teaching qualifications is crucial. For example, countries can provide flexible, modular initial teacher education and training (ITET), which allows prospective VET teachers to focus on skills and knowledge gaps without having to go through a full ITET programme (OECD, 2021[78]). In Denmark, for instance, the Diploma in VET Pedagogy (DEP) programme can be organised in different ways according to individual needs. Courses can be provided full time or part time, and can be delivered on the site of the college, in school premises or virtually. Participants also have an option of completing the DEP as a self-study (OECD, 2022[52]). In Saskatchewan (Canada), post-secondary teachers should take Adult Teaching and Learning courses, which are offered online and on campus and combine theory and practice. Instructors who have a degree in education may apply for exemption of the programme, and it is possible to receive transfer credit or a prior learning assessment and recognition credit if the instructor has gained the knowledge provided by the programme through other formal or non-formal training (OECD, 2022[52]).

Financial barriers can also be important, in which case financial support can be helpful for prospective ITET participants. In Sweden, state grants, administrated by the Swedish National Agency of Education, are available for VET teachers to combine work and studies to obtain a vocational teacher degree. This grant addresses training needs for VET teachers who lack pedagogical training, since most VET teachers are recruited from the relevant industries. To receive the grant, the principal must reduce the teacher's working hours by at least 25% to facilitate the teacher training (OECD, 2021[78]).

In addition, flexible arrangements such as part-time teaching and co-teaching with fully qualified teachers (e.g. guest lectures or practical demonstrations) can help industry professionals to combine working in industry and teaching in VET. To fully take advantage of the benefits of these flexible arrangements, the teaching quality and job quality of these industry professionals with teaching roles need be ensured (OECD, 2021[78]). Flexible work arrangements for industry professionals to teach in VET can also be further promoted and facilitated through close collaboration between VET institutions and industry. Industry and the VET sector can co-ordinate in terms of exchanging personnel between industry and VET schools, and this can be facilitated, for example, by making it easier for in-company trainers to become VET teachers and vice versa (OECD, 2021[78]).

Providing relevant labour-market related training to VET teachers

Integrating work-based learning in initial teacher education

Work-based learning (WBL) is as important for VET teachers as it is for their students. There are two aspects to WBL in the context of training VET teachers. First, part of their initial teacher education and training (ITET) can take place in a VET institution to give them direct experience of teaching students in a classroom. Second, part of their ITET could be organised as an internship, externship or secondment to a company to equip future teachers with industry-relevant skills. Both forms are equally important as VET teachers need to be well prepared not just in terms of pedagogy in VET, but also in terms of industry knowledge and experience related to the subjects they teach. In countries that have minimum industry experience requirements, the need for internships or other forms of work-based learning in industry is less pressing (OECD, 2021[78]).

In order to ensure that future VET teachers build their industry knowledge, partnerships between ITET providers and employers are crucial. Through such partnerships, trainee teachers can spend time in industry. For example, in 2014-15, Denmark initiated VET teacher traineeships in enterprises with 25 participating VET colleges, as part of its VET reform to strengthen the links between school-based and work-based learning. This initiative provided VET teachers with the opportunity to have a short period of in-company training to develop relevant teaching skills (OECD, 2021[78]).

Providing professional development opportunities to keep VET teachers' skills up-to-date

Professional development (PD) is critical in the face of change. Not only are the skills that need to be taught in VET changing, but so too are the pedagogical approaches and technology used in the classroom. Therefore, VET teachers need to regularly update their pedagogical and industry knowledge. In this context, PD can be a tool for improving their skills, changing how they teach or putting research results (such as proven pedagogies aimed at making VET schools more competence-based) into practice. Across the six OECD countries/regions with available data from the Teaching and Learning International Survey (TALIS),[8] 78% of VET teachers perceived PD as having a positive impact, similar to general education teachers (80%) (OECD, 2021[78]).

Effective professional development for VET involves a wide range of stakeholders. Making sure that VET teachers receive the necessary training – whether it be on pedagogical, industry or technological aspects of teaching – requires collaboration and co-ordination of multiple stakeholders at different levels (OECD, 2021[78]):

- **VET institutions and relevant associations** play a key role in facilitating access to PD for their teaching staff. Institutional leadership is often a key factor in the provision of and participation in PD and enables institutions to take a systemic approach to teachers' PD. In Denmark, large VET schools often have a department dedicated to PD for teachers and offer PD services while connecting key stakeholders. Such services include improving the skills and performance of middle-level leaders in assessing teaching quality and providing additional coaching support for underperforming teachers.
- **Teachers' and school networks** can be an effective means of sharing experiences and encouraging participation in PD. In England (United Kingdom), collaborative forms of PD such as peer observations, formal and informal networks, coaching and mentoring, and action research, are most valued by teachers in further education colleges. Japan uses a cascade model whereby trained teachers disseminate professional skills and knowledge to colleagues.
- **Local companies and industry associations** can provide and encourage PD. They can provide industry placements for VET teachers, just as they do for students from VET programmes. They may already be in close communication with VET teachers through setting up and improving

students' apprenticeships. In Denmark and Germany, VET teachers participate in work placements in industry to update their knowledge. Companies in these countries are interested in offering work placements to VET teachers to help improve how they train their apprentices under the dual VET system. England (United Kingdom), Spain and the United States also have several initiatives to foster this type of work-based PD. There are also other more indirect ways VET can benefit from exchanges with industry, including VET teachers shadowing workplace trainers for periods of time and in-company trainers teaching in VET institutions.

- **Local universities and relevant associations** can provide PD for VET teachers, but can also improve the quality of PD by sustaining the connections between practice and research. Partnerships with VET institutions can lead to joint research, for example action research by VET teachers with support from university research mentors. Partnerships may also be critical for informing universities about areas of need as well as changes in practice that need to be reflected in VET teacher education courses, and allow the development of coherent work-integrated teacher education programmes. In countries where universities provide PD, such as Austria and Germany, universities often have a strong connection with VET institutions and their practice.

VET teachers need the right, the support and the resources to participate in professional development. In many countries, participation in professional development is voluntary or dependent on senior management decisions. However, some countries give teachers the right to PD or make it mandatory by law in order to ensure their participation. In Slovenia, for example, PD is both a right and a duty for teachers by law and each teacher is entitled to five days of it per year. Teachers who participate in specific programmes, receive points which are necessary for career advancement. In Finland, participation in in-service training is compulsory for teachers in most VET fields and funded by the National Board of Education. In Bavaria (Germany), teachers are obliged to undertake regular, formal training, which is considered as part of their regular teacher assessment. In Italy, the 2015 reform of teacher training established compulsory, structured continuing in-service training for all teachers, including those in VET. Following this, the 2016-19 plan for the professional development of teachers identifies the motives, principles, governance mechanisms, quality aspects, ICT-based information systems, and – more importantly – content, priorities and financial resources for teachers continuing PD. To further enhance their professional development, the plan provided for skills needs analysis, incentives, more flexible training arrangements and a substantial increase in financial resources. Funding was increased from EUR 18.5 million in 2013-16 to EUR 270 million in the period 2016-19 (OECD, 2021[78]).

Even in countries where training rights or duties are not included in legislation, mechanisms can be put in place to foster access to PD. In Nordic countries, for example, PD is often personalised and based on negotiations between teachers and their employers. In Sweden, the time allowed for PD is regulated in collective agreements between unions and employers. The current agreement concerning teachers employed by municipalities grants them 102 hours of training per year. Providers (in practice, school leaders) and teachers plan what content should be included in the training. In Denmark, VET schools map the present levels of their teachers' pedagogical and vocational competence, evaluate their need for skills improvement, and provide the relevant professional development opportunities. A large VET school may have a department working on this. In Finland, schools and teachers generally draw up a professional development plan whereby teachers can plan and seek training opportunities; 43% of VET teachers have such a professional development plan, which is a larger share than for teachers in other levels of education in Finland (OECD, 2021[78]).

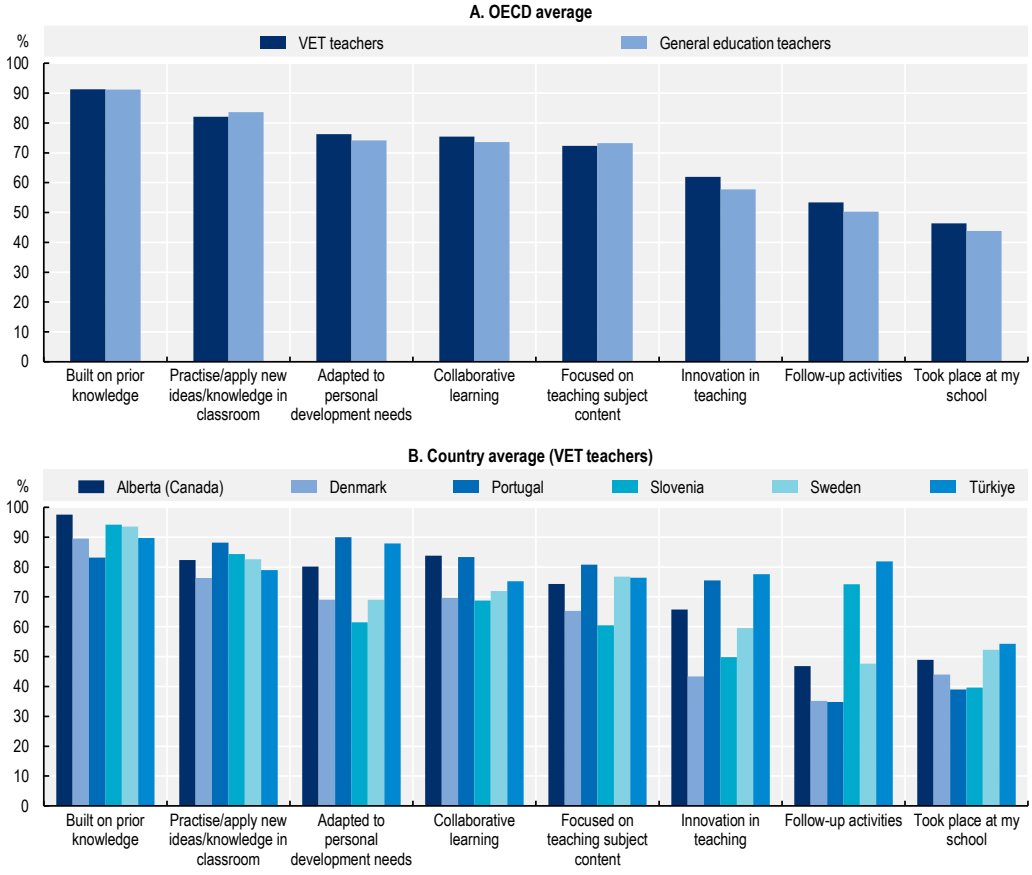
Teachers are more engaged in professional development when it is relevant to their teaching practice, curriculum and subjects. 2018 TALIS data confirm that teachers consider personalised approaches to training to be helpful. Across TALIS countries/regions with available data, 91% of VET teachers who considered a positive impact of their PD on their teaching reported that PD built on their prior knowledge, while 76% reported that PD was adapted to their personal development needs (Figure 2.6). Practical and collaborative learning (82% and 75%, respectively) were also identified as a characteristic of PD by a large

share of VET teachers who reported that their PD had a positive impact on their teaching. Collaborative learning can have many benefits, as involving teachers within the same VET institution or across different VET institutions can motivate them to learn new practices, and plan and implement putting their newly learned techniques into practice. Collaborative approaches to PD enhance motivation, responsibility and professionalism. Teacher networks or unions are an important source for self-organising professional development activities (OECD, 2021[78]).

Support measures for VET teachers' professional development activities include time off work, access to materials needed to participate in the activities, financial support and career incentives. In addition, identifying VET teachers' training needs enables relevant, customised and engaging professional development to be provided. Teachers are more engaged in professional development when it is relevant to their teaching practice, curriculum and subjects. Linking professional development programmes directly to the planning of VET programmes for coming terms and years can be useful for teachers. Customising PD to teachers' needs may require a training needs analysis. To keep their programmes relevant and up to date, PD providers should regularly seek inputs from industry, VET institutions, teachers and leaders (OECD, 2021[78]).

Figure 2.6. Characteristics of successful teacher professional development (PD)

Share of teachers who reported positive impact of PD on teaching during the last 12 months, by characteristic of PD



Note: VET teachers are those who reported in TALIS that they were teaching practical and vocational skills in the survey year in upper secondary programmes (ISCED 3), regardless of the type of school where they teach. The OECD average represents the unweighted average of the six countries/regions.
Source: OECD (2021[78]), *Teachers and Leaders in Vocational Education and Training*, dx.doi.org/10.1787/59d4fbb1-en.

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Annex 2.A. Employer engagement in apprenticeship in Scotland (United Kingdom)

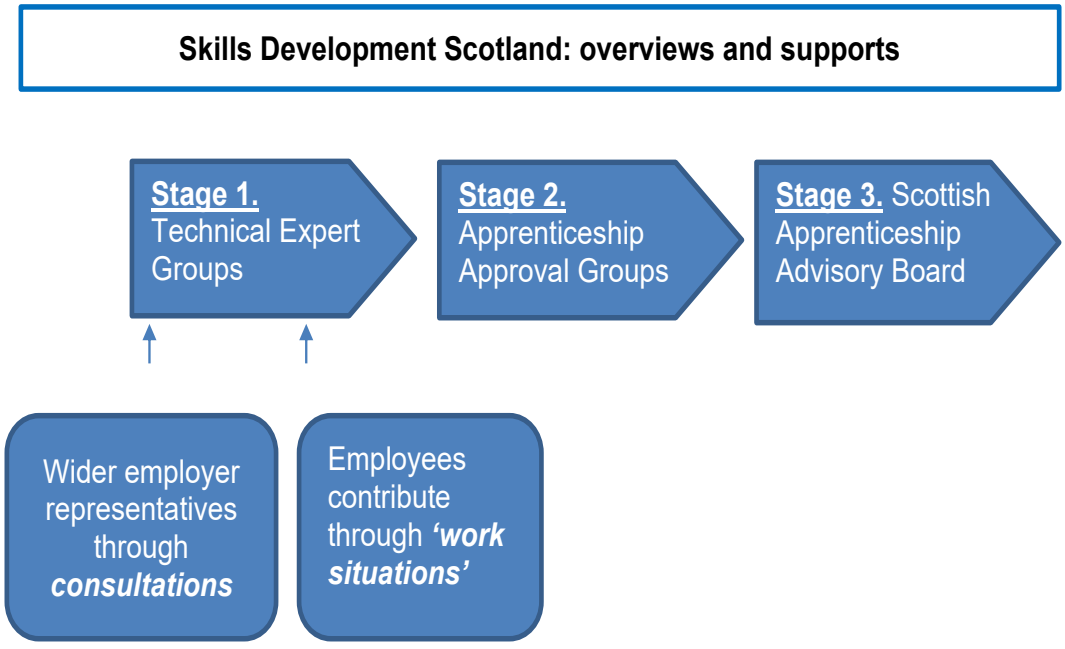
Employer engagement in the different stages of apprenticeship development

One of the main tasks of social partners (employers and trade unions) in Scotland is to ensure that apprenticeship qualifications provide skills in demand on the labour market. The diagram below shows the process of development (or update) of apprenticeships (standards, frameworks and qualifications) and the bodies taking part in this process. Social partners are key actors in these bodies and their engagement spans across different levels. The process of revision or development of new apprenticeship can be divided into three stages:

1. The process is initiated bottom-up by the Technical Expert Groups before being passed on to Apprenticeship Approval Groups for approval.
2. Apprenticeship Approval Groups ensure apprenticeships meet the Principles of Apprenticeships as agreed by the Scottish Apprenticeship Advisory Board (SAAB) Standards (Skills Development Scotland, 2022[17]).
3. SAAB scrutinises, challenges, and approves all apprenticeship frameworks for use in Scotland. It oversees quality assurance in apprenticeships (Skills Development Scotland, 2022[80]).

In 2021, SAAB approved 18 new and updated apprenticeships (Ruth, 2021[81]).

Annex Figure 2.A.1. Development and update of apprenticeships in Scotland (United Kingdom)



Stage 1

Technical Experts Groups (TEG) are bottom-up bodies that work and develop new or update existing apprenticeships. Technical Expert Groups are composed of 10 to15 people with relevant experience and represent employers, industry and professional bodies qualification and education experts, social partners such as trade unions. Members of a group take part in a minimum of four half-day meetings over a six-month period and an initial induction. The group refines and validates apprenticeship by identifying the skills, knowledge and behaviours needed to do the job effectively. The group also develops guidance on how to deliver the apprenticeship. The process usually takes around six to eight months (Apprenticeship.scot, 2022[82]).

The process also involves consultations, through which representatives of the sector/occupation and VET providers can provide feedback on the draft apprenticeship and ensure that it meets their needs. Consultation happens via an online survey, which is circulated widely to networks within industry once the apprenticeship is in draft form. Survey links are included on pertinent industry websites and highlighted within social media channels (Skills Development Scotland, 2022[17]). After the apprenticeship is developed, discussed, checked and agreed, it is issued to the Apprenticeship Approval Group for approval.

An interesting feature of TEGs is that they are short-lived as they are set up with the sole aim of developing or updating apprenticeships. In a context where employers' input into VET policy has been limited, it may be easier to guarantee employers' involvement if it is done on an ad hoc basis, when a specific needs emerge (Skills Development Scotland, 2022[17]).

Annex Box 2.A.1. How are apprenticeships developed in Scotland (United Kingdom)?

Occupation profiles contain details about the knowledge, skills and behaviours an apprentice needs to demonstrate to competently perform their entire job.

Work situations, managed by the Skills Development Scotland, are used to define 'what actually happens' on the job. The definition of work situations involves experienced employees (ideally with at least 3 years of work experience after having completed an apprentice or similar who can display "conscious competence" in their role) who are currently doing the job. These individuals first define the key work activities they perform individually and then agree collectively on the key work situations defining their job role. Employees participating in the definition of work situations also determine the amount of meta-skills that are required to perform the job tasks. Meta-skills, as defined by Skills Development Scotland, are skills required to increase resilience, performance and productivity (see Chapter 4).

These key work situations are then validated by the Technical Expert Group. A Technical Writer experienced both in the occupation and in developing standards is commissioned by Skills Development Scotland (SDS) to write the work situations in the Apprenticeship development quality standard based on the information provided from the employees and TEG.

In defining occupational skills and competences, information from the 'work situations' is combined with other data sources to reduce the risk that apprenticeship standards are biased towards a single source of evidence. A range of data sources can be considered: online jobs vacancy, insights from data science; other industry and professional standards; existing National Occupational Standards; and existing qualification structures.

Source: Skills Development Scotland (2022[17]), Apprenticeship Approval Groups, www.skillsdevelopmentscotland.co.uk/what-we-do/apprenticeships/apprenticeship-approvals-group/.

Stage 2

Apprenticeship Approvals Group (AAG) reviews the documentation submitted by the TEGs. Membership consists of the chair representing employers and 13 other organisations, including employers, trade unions, Scottish Government, and governmental agencies concerned with qualifications. Individuals are proposed by their organisations and appointed as members of AAG by SAAB. The Group meets approximately every month. AAG provides assurance and recommendations to SAAB in relation to Scottish Apprenticeship development, gives feedback and reports on AAG performance to SAAB, Scottish Government officials and minister. Concerning the development of apprenticeship frameworks, apprenticeship documentation submitted by the Technical Expert Groups is reviewed by the AAG subgroup for technical checks. AAG ensures apprenticeships meet the Principles of Apprenticeships as defined by the Scottish Apprenticeship Advisory Board Standards. Since 2020 AAG approves all Scottish apprenticeships. In the process of creation or revision of apprenticeships consideration is given to the needs of the Scottish economy, the preparedness of the sector to deliver new or revised apprenticeship frameworks and budgetary constraints (Skills Development Scotland, 2022[83]).

Stage 3

The Scottish Apprenticeship Advisory Board (SAAB) is a high-level group with a mandate covering various aspects of apprenticeships policy and providing recommendations and guidance to the government. The Group Board comprises a minimum of 20 members with a membership that consists for the majority of employers. Members should occupy senior roles within their respective organisations and represent a wide range of sectors. Representatives from Scottish Government, the Scottish Funding Council and Skills Development Scotland attend scheduled meetings as observers. SAAB covers policy, standards and frameworks, communications, and funding. SAAB is composed of the Group Board and four other groups working on specific topics such as standards and frameworks, employer equalities, employer and apprentice engagement. Each group is chaired by an employer. The chair of the group on apprenticeship engagement represents employers and is at the same time also a former apprentice (Skills Development Scotland, 2022[80]). The Board meet twice during the financial year. The Board engagement activity and communications are supported by Skills Development Scotland and the Scottish Funding Council (Skills Development Scotland, 2022[80]).

Overview and support

Skills Development Scotland (SDS) – the national skills body- reviews and improves the approach related to apprenticeship development and overviews the related processes. SDS also works to engage employers and other stakeholders to identify members of Technical Expert Groups. In case there are more employers willing to participate in Technical Expert Groups than places available, SDS have developed a modified lottery to ensure a good representation of TEG members by geographical location, business size and sector (public/private). SDS also works with the Federation of Small Business and the Scottish Chamber of Commerce to engage small and micro business (Skills Development Scotland, 2022[17]). SDS reviews internally all new and updated apprenticeships to ensure that language is unbiased. It provides guidance and supporting resources to carry out assessments of apprenticeships.

Avenues for further strengthening employer engagement

There is no direct evaluation of the impact of the described framework for social partner's involvement in Scotland on the provision of apprenticeships. Implicit indicators include changes in the provision of apprenticeship places by employers and outcomes from apprenticeship, bearing in mind that both provision and outcomes can be affected by a rage of various factors not related to the social partner's organisation.

According to the Scottish Employer Perspectives Survey, 19% of employers took on apprentices in 2021, as compared to the 16% in 2019 (Scottish Government, 2019[84]; Scottish Government, 2021[85]).

A recent OECD report (OECD, 2022[73]) suggests that Scotland (UK) can build upon the successful establishment of SAAB, the TEGs and AAG and their products and achievements, including the key principles, standards and frameworks, to further strengthen employer engagement in the apprenticeship system. Specifically, the report recommends that Scotland (UK):

- Provide incentives and support mechanisms for employers to offer workplace training and engage in the governance of apprenticeships. Targeted financial support can be offered to encourage employers who would not otherwise take on apprentices to do so and compensate for the costs involved. In addition, non-financial support, for example, for setting up training alliances or intermediary agencies and offering guidance and tailored advice, can also make it easier for employers to take on apprentices and build and strengthen training capacity.
- Establish a legal framework that not only ensures consistent policy and financial support for apprenticeships and employers but also defines the role of employers in the apprenticeship system. The aim should be to increase systemic, stable employer engagement and reduce the burden of time and resource costs involved in updating principles and guidelines. It will require a whole-of-government and stakeholder consultation to agree on the form and content of such a framework. This legal framework does not necessarily need to focus solely on apprenticeships but should in some form achieve the goal of supporting apprenticeships and increasing employer engagement covering the entire apprenticeship family and all learners.
- Increase the capacity and influence of the Scottish Apprenticeship Advisory Board (SAAB) to help strengthen the role of employers in the apprenticeship system. This can be done through better co-ordination and co-operation with the relevant stakeholders, in particular employer groups. SAAB should focus on consolidating fragmented activities by different employer groups and individual employers. SAAB should also increase co-ordination with and among non-employer actors, including unions and providers. These efforts can build upon existing sectoral and regional networks, with the assistance of SDS.
- Strengthen the training capacity of SMEs and better integrate them into SAAB to increase their representation in the apprenticeships system. After assessing where SMEs need the most support, they can be given targeted financial and policy support, such as the option of collective or inter-company training.

Notes

[1] Depending on the country nomenclature the regional level refers to regions, provinces, states, municipalities, etc.; It thus designates a level or multiple levels between the national level and the institutional (school/provider) level.

[2] Due to a reform of the regions in Norway, from January 2024 there will be 15 regions and 15 vocational training boards (Norwegian Government, 2022[86]).

[3] Further regulations on the ATAs will be on hearing in the autumn of 2023.

[4] Between 2018/2019 and 2019/2020 the number of participating companies doubled from 353 to 725, and the number of VET institutions providing education and training to students increased from 95 to 176 over

the same period. In 2019/2020 the companies offered 5 055 apprenticeship placement, 2 000 places more than in 2017/2018 (Slovakia State Institute of Vocational Education and Training, 2019[58]).

[5] Apprentices in 9-12th grade attend one day of theoretical and vocational training a week in Vocational Training Centers, and four days a week of on-the-job training in enterprises. Students attending Vocational and Technical Anatolian High Schools in the 12th grade receive two days of theoretical and vocational training at school and three days on-the-job training in enterprises.

[6] For ISCED level 5 it has been agreed to use the definition adopted for “vocational” programmes at lower levels. For ISCED levels 6 and above countries have been able to report a breakdown by orientation based on their own definitions of “professional” and “academic” or report programmes as having “unspecified orientation”.

[7] The definition of ‘adults’ differs across countries. ‘Adults’ may refer to individuals who are eligible for VET programmes targeting adult learners. However, the age and other requirements the person should meet to enter VET for adult learners vary across countries. For example, in Norway. according to a recent reform, students in initial VET have the possibility to choose programmes designed for adults from the age of 19, In Denmark, upper-secondary VET programmes for adults (EUV) are designed for those 25 years-olds and above.

[8] Alberta (Canada), Denmark, Portugal, Slovenia, Sweden, Republic of Türkiye.

3 Making vocational education and training more inclusive through increased flexibility

This chapter discusses how to make vocational education and training (VET) work for all, with a particular focus on young people at risk, migrants and refugees, and adult learners. It discusses the need for flexibility in VET programmes to be able to adapt to the needs of learners from different backgrounds, and with diverse preferences and aspirations.

Introduction

VET has the potential to cater to the needs of a wide range of learners. Typically, it has been seen as a route to skilled employment for young people in or right after upper-secondary education. As discussed in Chapter 1, young adults with a vocational qualification indeed have relatively strong labour market outcomes, and the VET pathway is therefore a valuable option for learners who are interested in preparing for skilled employment. Through its focus on more practice-oriented learning, VET can also be an interesting choice for learners who are less academically inclined. Moreover, as the demand for higher-level skills grows and countries expand their offer of professionally-oriented programmes at the tertiary education level (as discussed in Chapter 2), VET can increasingly be seen as a stepping stone into further learning. As such, VET can attract learners with various abilities and aspirations.

At the same time, as changing skill needs in labour markets and societies increase the importance of lifelong learning, VET can play a crucial role in providing relevant opportunities for upskilling and reskilling to adults who are already in the labour market. As shown in Chapter 1, the use of VET by adult learners differs strongly between OECD countries and between types of VET programmes. An increased focus on adults in VET will imply even greater diversity in the background and needs of learners.

Such a diverse student population calls for flexibility to adapt to the various needs and preferences of the learners. This may involve offering different types of VET programmes, for example of different duration and with a different focus on vocational versus general content. It may also involve flexibility in terms of the delivery, for example through online learning and modular provision. Flexibility may also mean additional support for those who need it. Such flexibilities will help ensure that VET can truly be a vehicle for more inclusive education and training systems.

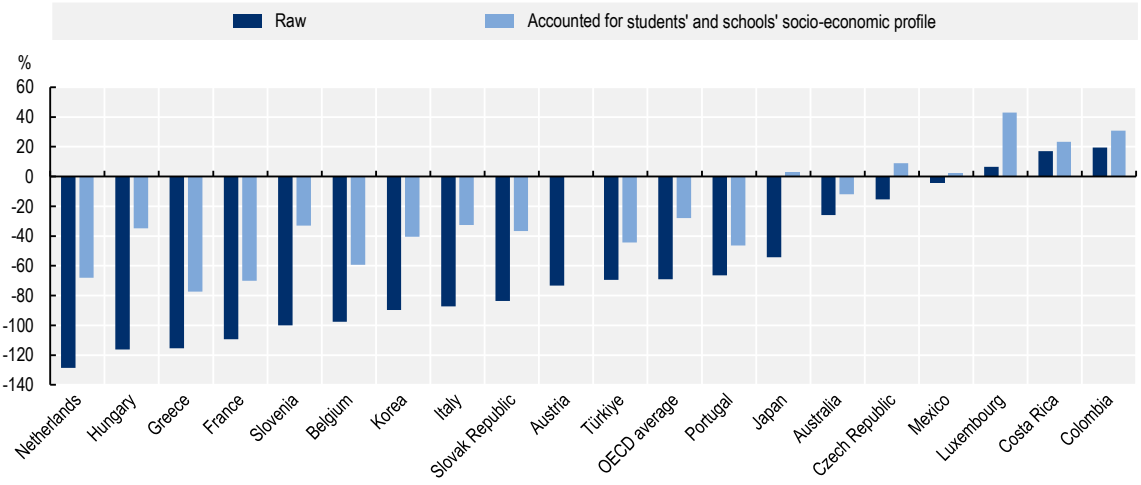
This chapter focuses on three types of VET learners. First, it discusses the role VET can play in catering to the needs of learners who are at risk of dropping out of the initial education system. Second, it looks a migrants and refugees and discusses how VET can support their integration in labour markets and societies of the host countries (and offer relevant skill development for a potential return – when this applies). Third, the chapter zooms in on adult learners in VET and the flexibility that is needed to overcome the typical barriers to training that they face. These three groups are of course only a subset of the full diversity in the VET target population, but the insights from these groups of learners can provide valuable lessons for policies and practices that target other groups.

How can VET serve young people at risk?

In many countries, VET plays an important role in engaging learners in education, including those who are less attracted by or struggle with academic content. Indeed, data from the Programme for International Student Assessment (PISA) show that 15-year-olds who are in (pre-)vocational programmes have weaker performance in reading, mathematics and science than their peers in general programmes (Figure 3.1), reflecting that learners with weaker academic skills often select into (or are selected into) VET programmes. As Figure 3.1 shows, differences between learners in different programme types are smaller when accounting for socio-economic differences between the learners, as learners in VET programmes are more likely to come from less advantaged background and more likely to attend a socio-economically disadvantaged school.

Figure 3.1. Reading score differences for 15-year-olds in general and vocational programmes

Percentage difference between learners in vocational and general programmes



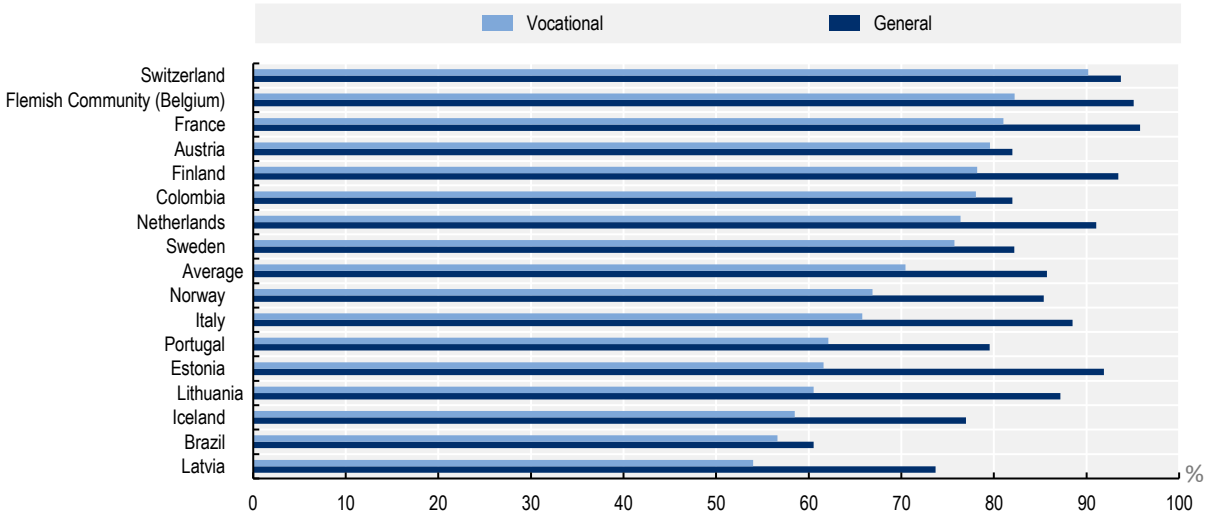
Note: Vocational programmes also include pre-vocational programmes. Only OECD countries with at least 5% of 15-year-old learners in VET included. Insignificant differences displayed in different shades of blue.
Source: OECD (2020[1]), *PISA 2018 Results (Volume V): Effective Policies, Successful Schools,* https://doi.org/10.1787/ca768d40-en.

By providing a more practice-oriented pathway, VET can play an important role in engaging learners who have limited interest in or struggle with academic learning and can as such contribute to lower overall dropout. In the United States, Kulik (1998[2]) shows that high–risk students are eight to ten times less likely to drop out in the 11th and 12th grades if they enrol in a Career Technical Education (CTE) programme. Also for the United States, Plank, DeLuca and Estacion (2005[3]) find that students who enrol in some CTE courses have a lower risk of dropping out, but that students who enrol in curricula that are too heavily focused on CTE courses have a higher probability of dropping out. For Portugal, Henriques et al (2018[4]) show that take-up of vocational courses is linked to a lower probability of dropout for low-ability students, but increases the dropout probability for high-ability students. Analysis of international cross-sectional data finds that nations enrolling a large proportion of upper-secondary students in vocational programmes have significantly higher school attendance rates and higher upper-secondary completion rates (Bishop and Mane, 2004[5]). While most of the research points towards a negative association between VET and high-school dropout, some research also finds no effect of VET on dropout (e.g. Agodini and Deke (2004[6]) for the United States).

Efforts continue to be needed to ensure that at-risk learners can be successful in VET. Additional support may be needed to ensure that learners in VET successfully complete their programmes to increase their chances of smooth labour market entry or further learning. Completion rates in VET are typically lower than in general education (Figure 3.2). Interpreting such differences between general and vocational dropout rates risks painting an overly negative picture of VET; and it should be taken into account that in the absence of VET options overall dropout rates might have been even higher.

Figure 3.2. Completion rates in upper secondary education, by programme orientation at entrance

Share who completed upper secondary education by theoretical duration plus two years (2018)



Note: The data presented in this table come from an ad-hoc survey and only concern initial education programmes. The reference year (2018) refers to the year of graduation by the theoretical duration plus two years.
Source: OECD, (2020[7]), *Education at a Glance 2020: OECD Indicators*, https://doi.org/10.1787/69096873-en.

Designing programmes that serve as a bridge into further learning and employment

Various countries have established programmes that target learners who are at risk of dropping out, or focus on re-engaging drop-outs in education. Some of these programmes are relatively short and aim to provide a bridge into a longer upper secondary programme, or focus on occupational skills and prepare for entry into the labour market. The risk of providing a programme that targets disengaged students is that those programmes, and perhaps VET more broadly, may be perceived as a programme for those who failed at school. To address this risk, VET programmes for youth at risk should not in any case be a dead-end. They should lead to a qualification that is recognised on the labour market and allow students who successfully complete this stage to continue seamlessly to a more advanced programme.

In Sweden, introduction programmes target students who do not meet admission requirements to upper secondary vocational programmes. Programmes are individualised, designed to prepare students for entry into an upper secondary programme or the labour market (Skolverket, 2023[8]). In Hungary the "vocational training bridge programme" targets drop-outs or students at high risk of drop-out. It aims to provide a bridge into regular vocational training programmes, or alternatively prepare students for entry into the labour market (NIVE, 2023[9]). In Austria, integrative apprenticeships (IBA) are upper-secondary VET programmes that target youth at risk of poor outcomes, including dropouts from basic schooling. IBA accounted for 6% of apprentices in 2014. IBA participants receive support both during work placements and at school and can take an additional year or two to complete their apprenticeship, or may choose to obtain a partial qualification. Switzerland introduced two-year EBA apprenticeships (*Grundbildung mit Eidgenössischem Berufsattest*) in 2005, designed for youth who face difficulties at school, struggle to find a three or four-year apprenticeship, or risk dropping out. Those who complete a two-year EBA apprenticeship programme may progress to three- or four-year apprenticeships (typically joining the second year of the programme) in a related occupation – for example moving from a plasterer qualification to qualify as plasterer and drywall installer. It has proved successful in both helping young people find a job upon completion and allowing for progression to more advanced qualifications, while allowing companies that offered work placements to break even financially by the end of the programme (Fuhrer and Schweri, 2010[10]).

Offering practical training when work-based learning is inaccessible

One potential reason for dropping out in vocational programmes that include compulsory work-based learning is that some learners are unable to find a placement with an employer. This problem might arise at two different stages, depending on whether the challenge of finding a work placement arises before the start or in the course of the programme. On the one hand, in the German or Swiss model of apprenticeship, learners can only start their vocational programme once they have secured an apprenticeship contract with an employer. The advantage of this approach is that it creates an automatic alignment between enrolment in particular vocational programmes and the availability of work-based learning, which signals labour market needs. Under this approach, young people who cannot find an apprenticeship place cannot start their vocational programme. To keep them in the education and training system, both Germany and Switzerland offer bridging programmes, which typically take one year to complete and are designed to lead into an apprenticeship (see next subsection).

On the other hand, in the apprenticeship models found in Denmark, Hungary or Norway, students start their vocational programme and look for a work placement afterwards. In Demark students enter a basic course for a year and then progress into the main course to pursue dual training in the occupation of their choice (Andersen and Helms, 2019[11]). Under Norway's "2+2 model" (or a slightly different split in some occupations) students pursue two years of predominantly school-based VET followed by two years spent in a company (Cedefop, 2019[12]). In Hungary, students initially chose a sector and choose a specific occupation after the foundation year(s). Under these models, students benefit from some career exploration before choosing a specific target occupation. The downside is that this model leaves some room for misalignment between enrolment in vocational programmes and the availability of work placements in companies. In such contexts, enforcing "mandatory" work-based learning would risk leaving some learners without opportunities to complete their training.

In countries where school-based alternatives are readily available, students may simply transition to a school-based programme. In Norway, a considerable share of VET students transition to a general upper secondary programme after two years. But in many cases, transition to a school-based vocational or a general programme is not a readily available option. Then it is important to offer a safety net to students who are unable to find a work placement. In Austria, ÜBA (*Überbetriebliche Ausbildung*, intercompany apprenticeship training) courses allow young people who are unable to find a regular apprenticeship placement to obtain their qualification in accredited training centres. These training centres include workshops that simulate an in-company environment and there is also an element of in-company training. Countries that have these types of back-up options also heavily relied on them during the COVID-19 pandemic, when the offer of work placements was limited. Various countries also introduced (temporary) school-based alternatives during that crisis period (OECD, 2021[13]).

The challenge is to find a delicate balance: offer a safety net, but avoid that the widespread availability of back-up options undermines efforts to promote the use of work-based learning. Several countries use data on work placements to progressively adjust the size of specific programmes, constraining the number of admitted students. For example, in Sweden a mandatory 15-week work placement is required in all upper secondary programmes. While a relatively small part of the overall programme (about 15%), this measure helps adjust programme sizes in the light of the availability of work placements (Skolverket and ReferNet Sweden, 2019[14]). Similarly, in Denmark students first complete a basic programme and progress into one of the associated main programmes. Students must secure an apprenticeship contract with an approved training company before starting the second half of the basic programme. Exceptionally, and within a pre-defined quota, students who are unable to find a placement may pursue practical training in school workshops. The quota ensures that the number of students is aligned with labour market needs (Andersen and Helms, 2019[11]).

Facilitating access to work-based learning opportunities

Work-based learning is a powerful way of engaging learners and preparing them for work by developing both technical and broader employability skills, while connecting them with potential employers. Securing sufficient places for work-based learning is a key challenge for policy makers. While the safety-net solutions described above may be useful as a last resort, the focus should be on making work-based learning accessible to all, including learners at risk of dropping out. Otherwise there is a risk that the most disadvantaged students systematically miss out on the benefits of work-based learning. That would be unfortunate, as they are the ones most in need of boosting motivation through training set in real-life work contexts, and they would benefit particularly from obtaining a first work experience and building connections with employers.

Despite its compelling benefits, making work-based learning happen is often difficult. Some firms may offer work-based learning to learners at risk out of social responsibility. But employers, understandably, also need to run business and generate profits and some may not be able to afford to hire an apprentice if that would generate losses for their company. Therefore, fully exploiting the potential of work-based learning for learners at risk requires programmes that are carefully designed in a way that aligns with business interests. Finding suitable placements for learners at risk is often particularly challenging. Extensive research on the costs and benefits of apprenticeships (see also Chapter 2) shows that employers are more willing to offer apprenticeships when the benefits obtained (in terms of productive contributions by apprentices, as well as benefits that result from saving money by retaining former apprentices instead of costly external recruitment) outweigh the costs. Apprentice characteristics affect that cost-benefit balance: apprentices with stronger skills will be more productive throughout apprenticeship than those with weaker skills, generating a more favourable balance for employers. Employing youth at risk is likely to be less appealing financially to firms, as many have weaker skills than their peers. In addition, apprentices with weaker skills will be slower learners (it is easier to learn with sound literacy and numeracy skills) and therefore their productivity will increase more slowly. In recognition of the potentially worse cost-benefit balance, firms taking on young people in the Austrian IBA programme receive higher subsidies than other firms, and public resources cover additional training needed by apprentices and trainers in the firm. Various other policy tools may be used to facilitate participation in work-based learning among youth at risk, in particular to make sure they are ready for work-based learning and they receive adequate support during their work placement.

Better preparing youth for work-based learning

Various countries have implemented initiatives designed to provide a bridge between schools and work-based learning, or allow NEETs to return to education and subsequently pursue an apprenticeship. Such programmes typically include a component of general skills (e.g. literacy, numeracy, foreign languages), helping learners to address weaknesses they might have. In addition, programmes tend to include a component of vocational skills, often basic vocational skills related to a particular sector or occupation. In some programmes the purpose of the vocational component is to allow for career exploration and help match learners to suitable occupations and work-based learning opportunities. Finally, programmes commonly target broader employability skills, such as teamwork, resilience and time-keeping.

Examples of such programmes include pre-apprenticeships in Australia (typically lasting 6-12 months) and the United States. In Germany and Switzerland, where upper secondary VET is largely apprenticeship-based, a variety of programmes are offered to young people who could not find an apprenticeship and without such opportunities would drop-out. In Germany, programmes under the umbrella term “basic vocational training year” serves young people who have completed lower secondary school that was preparing for entry into VET, but have been unable to secure an apprenticeship contract with an employer. Basic vocational training year programmes enrol nearly 10% of upper secondary VET students and are recognised as the equivalent of the first year in the dual system. Norway’s Apprenticeship Candidate

Programme (*lærekandidatordningen*) serves learners who lack the pre-requisites for an apprenticeship programme. It focuses on developing skills needed in working life. An evaluation of the programme shows that it facilitates development of skills among students with poor academic performance (as measured through grades in the last year of lower secondary education). However, only a very small share of programme completers manage to complete a VET upper secondary programme (NIFU, 2023[15]). In Switzerland bridging measures are designed and funded by cantons and communities. France introduced pre-apprenticeships in 2019 (*prépa-apprentissage*), designed to provide youth with sound basic and transversal skills needed for participation in an apprenticeship (Ministry of Labour, 2021[16]).

Providing support during work-based learning

Some learners may struggle to complete their programme, because of difficulties with coursework or problems that might arise in the workplace. For example, in Germany a quarter of apprenticeship contracts were dissolved in 2020 – in line with the shares of previous years (due to various potential reasons, including drop-out or change of occupation) (BIBB, 2022[17]). A recent report in England (United Kingdom) found that nearly half of apprentices drop out before completing their training (Richmond and Regan, 2022[18]). Drop-out is a problem for young people as they miss out on an opportunity to obtain a vocational qualification, which in many cases leaves them without an upper secondary qualification. It is also costly for employers who tend to invest heavily in training at the initial stages of apprenticeship and when the apprentice drops out, are not able to benefit from the productive contributions of skilled apprentices. Employers may anticipate high drop-out rates by screening candidates and identifying those at high risk of drop-out, which may ultimately reduce the availability of work-based learning opportunities to youth at risk.

Some factors, including individual characteristics, are associated with higher rates of drop-out from apprenticeships. A large-scale study of Australian apprentices (Powers and Watt, 2021[19]) found that initial levels of interest and anxiety were important predictors of drop-out considerations, suggesting that early detection and warning may help prevent drop-out. In addition, the training received, job security and perceptions of occupational expertise were associated with higher levels of workplace interest, suggesting that measures may also target these factors. Research in Germany found that migration background, lower levels of prior education and holding a secondary job (to earn extra money) are linked to higher rates of contract cancellation (Seidel, 2019[20]).

Offering learners support during work-based learning can help them learn faster and overcome difficulties, whether they may concern academic coursework, technical subjects or relationships with their employer. The availability of additional support can increase the chances of completion and encourage employers to take on learners at risk of dropping out as apprentices. In academic education, there is a relatively well understood set of approaches designed to support those who struggle in the classroom. In strong school systems, those facing the greatest challenges receive extra coaching, formally or informally; mentoring is offered; wider personal or social problems affecting school performance are addressed. Several countries have implemented similar supportive measures for apprentices. For example, in Austria, learners have access to training assistants, who can provide support in various ways: tackle problems that may arise (e.g. offering psychological or pedagogical support), set up a personal learning plan, or assist in case of a conflict with the employer (Sozialministerumservice, 2023[21]). In Switzerland, apprentices in the two-year initial VET programmes (EBA) are entitled to publicly-funded individual coaching and remedial courses, mostly to tackle weak language skills, learning difficulties or psychological problems. Most coaches are former teachers, learning therapists or social workers, and receive targeted training in preparation for their job (e.g. 300-hour training in the case of Zurich).

Similarly, in Germany apprenticeship assistance is available to those at risk of dropout, as well as to dropouts - to support transition into another apprenticeship or training programme. The German public employment service offers Assisted Apprenticeship (*Assistierte Ausbildung*, AsA) and Training Assistance (*Ausbildungsbegleitende Hilfen*, abH) to support all learners at risk of dropout during apprenticeship programmes. Assisted Apprenticeship (AsA) is designed to support both apprentices who completed preparatory programmes and their employers in the completion of upper-secondary VET. Training Assistance (abH) is available to young people during their apprenticeship, and supports dropouts seeking to transition into another apprenticeship. Assistance also includes remedial education and support with homework and exams, which helps to overcome learning difficulties. Socio-pedagogical assistance (including mentoring) is available, and this includes support with everyday problems and mediation with the apprentice's employer, school trainers and family. Another proactive measures in place to prevent dropout in Germany is the VerA (*Verhinderung von Ausbildungsabbrüchen*) that is initiated by the German Federal Ministry of Education (BMBF). Within the VerA programme, voluntary senior experts (e.g. retired professionals) counsel apprentices who are experiencing difficulties and are considering terminating their training. Apprentices who are struggling financially may also be eligible for grants to support completion (Bergseng, Degler and Lüthi, 2019[22]).

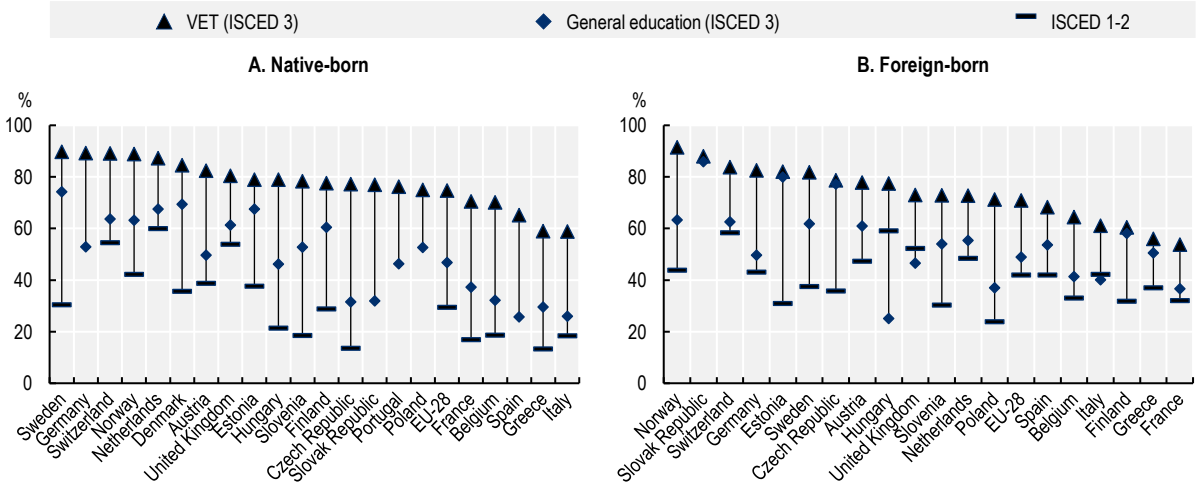
How can migrants and refugees be supported in their VET journey?

Migrants and refugees are one particular group of learners who could potentially face barriers to VET entry and successful completion. At the same time, it has many potential benefits, as it can support their integration in the labour market of their host countries, and enable them to continue learning and developing relevant skills for their return (in cases where a return is possible and desired). Building strong, flexible and inclusive VET systems where migrants and refugees can succeed results in broad benefits – not just for migrants, but also for the wider group of students with disadvantaged backgrounds (Jeon, 2019[23]).

Upper-secondary VET graduates – both native and foreign-born – are more likely to be employed compared to both upper-secondary general education graduates and people without upper-secondary qualifications (Figure 3.3). The benefits of VET appear to be stronger for disadvantaged students. For example, migrants and refugees are more likely to continue working in the same firm where they did their apprenticeship than their native peers (Jeon, 2019[23]). Evidence suggests that work-based learning, in particular apprenticeship, is one of the most effective ways for young refugees to integrate. Several OECD countries have invested in VET for enhancing integration and responding to skills shortages and ageing populations while at the same time taking the opportunity to improve VET systems for a wider group of students (Jeon, 2019[23]).

Figure 3.3. Employment outcomes of native- and foreign-born upper-secondary VET graduates

Share of employed people (15-34 years old), by their highest qualification attained, programme orientation and place of birth, 2018



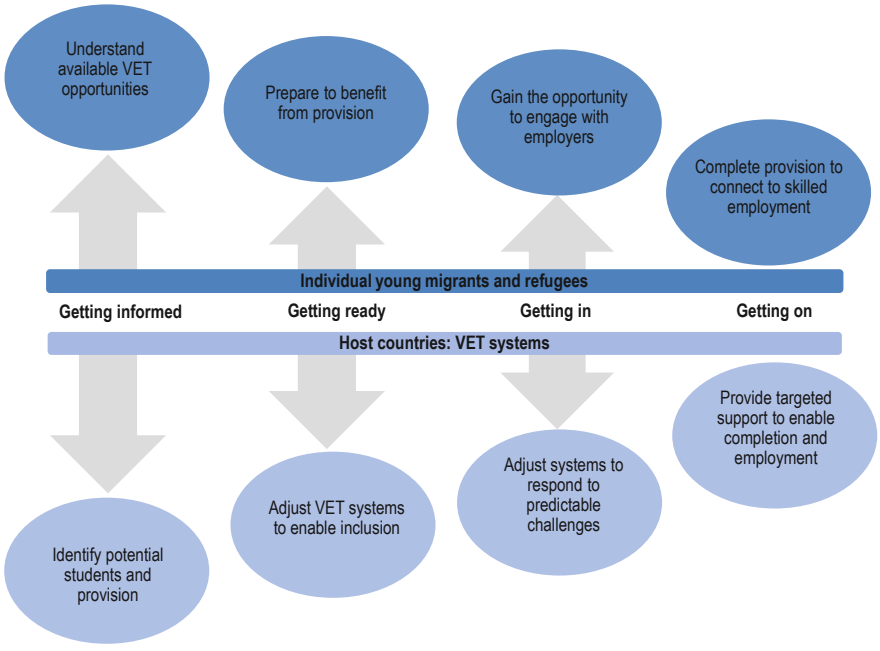
Notes: ISCED 3 refers to upper-secondary education, ISCED 1-2 to primary education and lower-secondary education.
Source: Jeon, S. (2019[23]), *Unlocking the Potential of Migrants: Cross-country Analysis* , https://doi.org/10.1787/045be9b0-en (using the EU Labour Force Survey).

Support measures to integrate young migrants and refugees into VET and the labour market

Migrants and refugees face a number of predictable challenges in navigating VET systems which can be grouped into four areas. The four barriers can be summarised as getting informed, getting ready, getting into and getting on in VET (Figure 3.4). Previous OECD work has identified ways in which VET systems responded to these challenges, enabling greater inclusion in VET, while maintaining the standards expected by employers.

Countries can support the engagement of these young people by making relatively small adjustments to their VET systems. Ultimately, such actions serve to strengthen VET systems by making them more flexible and more inclusive in ways that work not only for young migrants, but also for other disadvantaged and vulnerable groups. This means that countries may need to take different approaches to the systemic design and delivery of the VET system and consider long-term national strategies that involve effective and efficient co-ordination and peer-learning mechanisms across relevant stakeholders, in particular social partners. Programmes that can last over the long term and be compatible and closely connected to existing programmes are more sustainable and efficient, and easier to evaluate, compared to operating short-term, temporary programmes. Appropriate adjustments for the needs of refugees can be expected to result ultimately in a more flexible and inclusive VET system for the benefit of all learners, employers and for society in general (OECD, 2022[24]; Jeon, 2019[23]).

Figure 3.4. Support measures to integrate young migrants and refugees into VET and the labour market



Source: Adapted from Jeon, S. (2019[23]), *Unlocking the Potential of Migrants: Cross-country Analysis*, https://doi.org/10.1787/045be9b0-en.

Getting informed: Understanding VET opportunities

Refugee and migrant populations are heterogeneous, including young people of different ages and different levels of interest and experience of VET. It is important therefore for host countries to engage with students in a personalised and co-ordinated way in order to assess their needs and capabilities and to better engage them in VET. This also implies a need for upfront assessment of prior learning and skills (Jeon, 2019[23]).

Young refugees are often unfamiliar with or have a poor opinion of VET, based on experience in origin countries where VET is not popular or common. Familiarisation of refugees with the VET system and subsequent career opportunities requires proactive provision of personalised career guidance and mentoring services, with basic information in different languages, and mobilising existing information mechanisms established for the general population such as schools, career guidance services, public employment services as well as reception centres, social services centres and non-governmental organisations (NGOs). In this, it is important to provide a clear understanding of both the degree of labour market readiness and the implications of continuing in education (Jeon, 2019[23]). In Sweden, for example, multi-lingual, online career guides on different occupations help refugees assess their own interests, skills and qualifications against different occupations. The guides were developed together with employers' organisations, and counsellors from public employment services can assist refugees in using the guides (Jeon, 2019[23]).

Pro-active approaches to career guidance respond to circumstances where students and their families have poor understanding of options available and are still dealing with the results of traumatic experiences, as is likely the case for many refugees. Refugee students can be expected to be suffering from post-traumatic stress due to enforced displacement, family bereavement and separation and daily material

stress (Spaas, 2022[25]). In such circumstances, counselling approaches that recognise the individual student and their story before beginning to explore the right educational and training options are likely to be more effective. In Denmark, for example, career counsellors have used a five-step approach to recognise the individual stories of refugee students, using creative means to explore preferences, hopes and perceived barriers within career aspirations, leading to co-construction of a plan of action (Petersen, 2022[26]).

Getting ready: Preparing for VET, including apprenticeships

Even if upper-secondary VET becomes a goal for young migrants, they often face a number of barriers. Effective preparatory programmes can enable smooth progression into mainstream upper-secondary VET by combining language, vocational and academic learning, engaging social partners, emphasising work-based learning and providing career guidance. In Sweden, for example, where upper-secondary VET is primarily delivered through school-based programmes, Swedish for Immigrants (SFI) and Swedish as a Second Language (SVA) programmes help migrants acquire basic to advanced knowledge of the Swedish language. SFI is combined with vocational adult education, including apprenticeships, in different occupations. In some municipalities, the SFI offer is tailored to particular professions. Targeted pre-vocational programmes that include work-based learning play particularly important roles, allowing students to build social networks and familiarity with the host-country education system and the labour market (Jeon, 2019[23]). Box 3.1 provides an example of a Swiss pre-apprenticeship programme tailored to migrant learners who are also in need of language learning.

In countries where upper secondary VET provision is primarily delivered through apprenticeships, preparatory programmes (as described in the previous section) can provide potential apprentice employers with greater confidence that migrant youth will contribute productively through the whole duration of their apprenticeship, so balancing out the costs to the employer of taking on the apprentice.

Box 3.1. INVOL – Pre-apprenticeship Programme for individuals with migrant background

In Switzerland, a programme to facilitate the integration of migrants into regular VET and the labour market has been in place since 2016. The INVOL programme was developed by the federal office responsible for migration (SEM), and has been implemented in most cantons. Professional training organisations (PTOs) and a large number of employers are also involved in the organisation of the training activities (Aerne and Bonoli, 2021[27]).

The programme is a one-year long preparatory training course (*Integrationsvorlehre*) designed to facilitate enrolment in apprenticeship programmes (dual VET) by adults aged 18-35 with previous work experience. It includes in-company training (lasting at least eight weeks, usually three days a week), teaching of practical skills and technical knowledge in a given occupational field, and language training with the goal of achieving an A2 level certificate (from the Common European Framework of Reference for Languages) (Kuczera and Jeon, 2019[28]). The programmes is available in most occupational fields and focuses not only on the acquisition of technical competencies, but also soft skills, with an emphasis on cultural aspects (UNHCR, 2022[29]).

The INVOL programme opens 800 –1 000 places a year, and it was recently renewed until 2024. In 2018, around 800 refugees were able to start the programme, usually based in professional schools and companies. Around two-thirds of them continued into regular VET upon completion of the INVOL programme (Aerne and Bonoli, 2021[27]).

Getting in: Enabling easier access for young migrants and refugees to VET

Refugees often face barriers to entering VET. Specific challenges include relatively weak language and other skills, lack of relevant social networks, lack of knowledge about labour market functioning, as well as possible discrimination in the apprenticeship market. In addition to providing preparatory programmes that can address such common barriers (as described above), countries have responded to the challenges by offering flexible VET provision, such as modular, shorter or longer programmes (e.g. the EBA apprenticeship programme in Switzerland and IBA programme in Austria, as described in the previous section) – which address the cost-benefit concerns that tend to drive employer thinking.

Governments can also provide schools and employers with reassurance by allowing legal flexibility for humanitarian migrant students and apprentices to enter into and complete upper-secondary VET as well as giving them permission to work for a period after completing an apprenticeship. In response to the 2015 inflow of asylum seekers for example, Germany introduced what is known as the 3+2 rule whereby asylum seekers are guaranteed that they will not be deported during the duration of their training and employment up to two years later, even if their asylum claim is ultimately rejected.

Getting on: Supporting the completion of VET

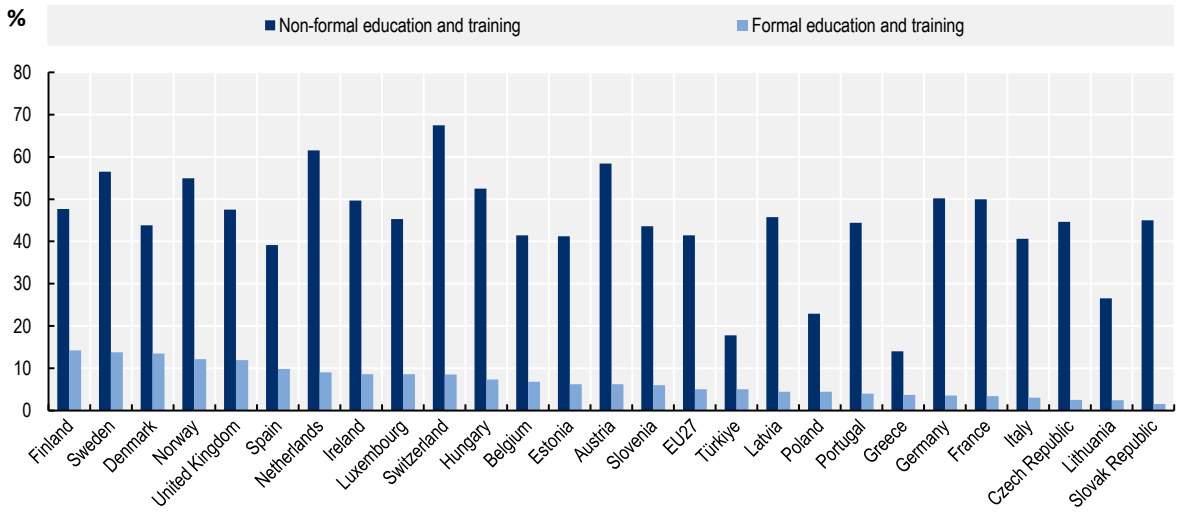
Refugee students tend to be less successful in completing upper-secondary VET than their native peers. Higher dropout rates are linked to lack of knowledge about the functioning of the labour market and the VET system, weaker language and other skills, difficulty in securing training placements for work-based learning, and inadequate connections between schools and workplaces. Dropouts are particularly problematic for apprenticeship programmes because the productive value of the apprentice emerges most strongly towards the end of apprenticeship. Work-based learning also tends to take place at the end of VET in school-based systems and early dropouts have less opportunity to apply skills in real workplaces, develop useful networks and position themselves well for the transition into work. Personalised support through the use of mentors and coaches as well as other support mechanisms to increase connections between schools and workplaces during VET can enhance the outcomes of migrant students and all students at risk of dropout (Jeon, 2019[23]) (see previous section) The majority of OECD countries have specific support measures in this respect (OECD, 2021[30]). In addition to support for learners, companies could also benefit from additional support. In Germany, apprenticeship employers must belong to a Chamber of Commerce or Crafts and many Chambers have put in place initiatives to help employers to deal with unexpected challenges encountered among refugee apprentices. Legal and practical training is available, as are employer networks to facilitate peer learning (Bergseng, Degler and Lüthi, 2019[22]).

How can VET be made more accessible to adult learners?

In a rapidly changing labour market, the ability to adapt and learn over the life course is more important than ever. Despite the increasing need for adults to continue to invest in their skills, a relatively small portion of adults participate in education and training. For instance, according to the European Adult Education Survey (2016), on average across EU countries, only 5% of adults aged 25 or older participated in formal education and training in the last 12 months, and around 40% of them took part in non-formal education and training activities (Figure 3.5). Among the more than thirty countries participating in the survey, more than 20 have participation rates in non-formal training of at least 40%, while in only five countries participation rates in formal education were higher than 10%: Denmark, Finland, Norway, Sweden and the United Kingdom. Data from the OECD Survey of Adult Skills (Programme for the International Assessment of Adult Competencies, PIAAC) for non-EU OECD countries paint a similar picture. As shown in Chapter 1, data on enrolment in formal VET programmes confirm that in many countries relatively few adults participate in such programmes.

Figure 3.5. Participation in formal and non-formal education and training

Participation rate in education and training (last 12 months), 25- to 64-year-olds (2016)



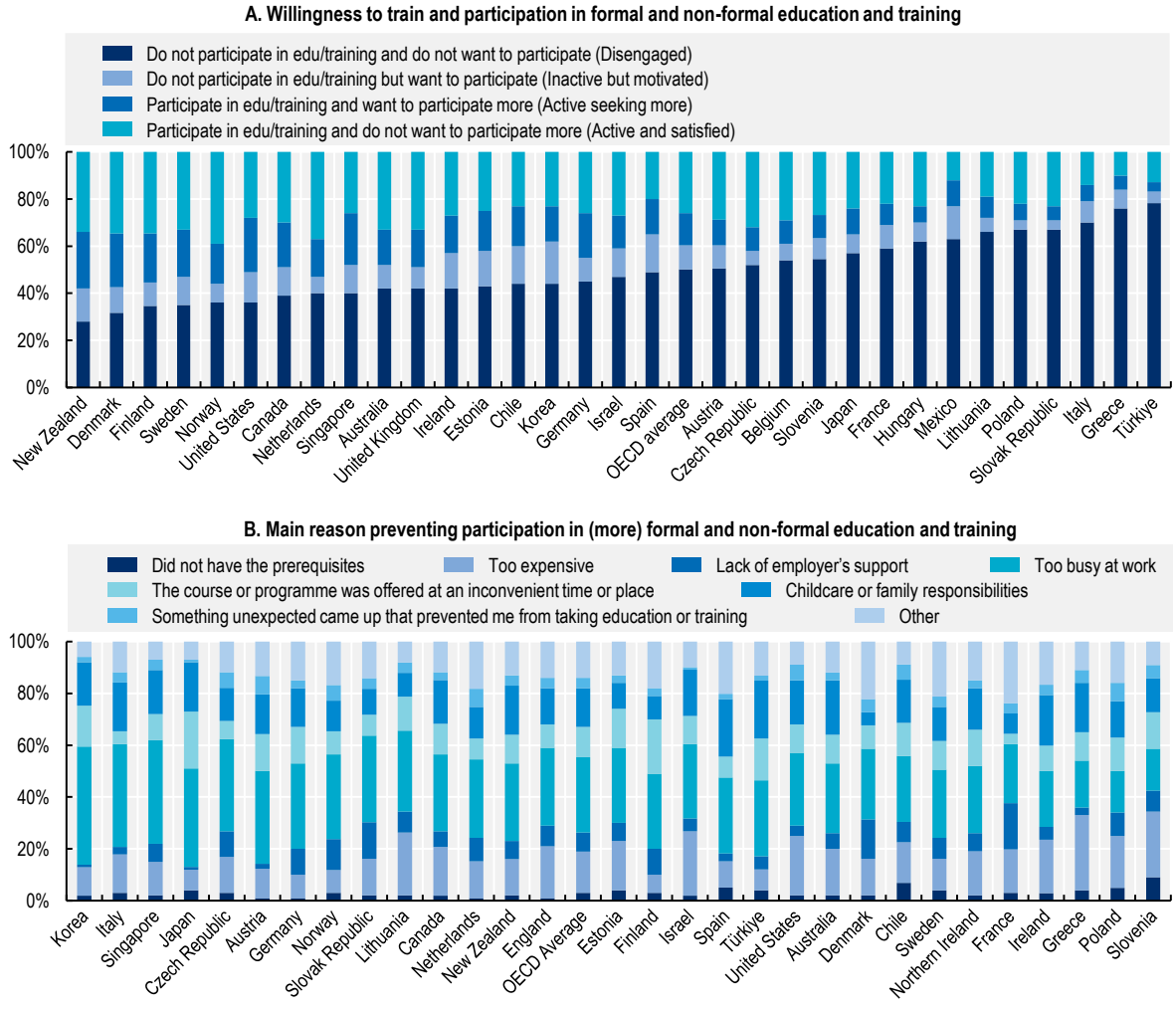
Source: Eurostat (2016[31]), Adult Education Survey 2016, https://ec.europa.eu/eurostat/web/microdata/adult-education-survey.

Moreover, in many countries a significant proportion of adults lack the basic literacy, numeracy and digital problem-solving skills needed to be lifelong learners (OECD, 2021[32]). According to data from the OECD Survey of Adult Skills, on average across OECD countries 20% of adults have weak literacy skills and 24% have weak numeracy skills[1], and about a third of adults have no ICT skills or only weak digital problem-solving skills.[2] This is especially concerning when taking into account the increasing need for these skills in the labour market and society more broadly (as discussed in Chapter 4). Moreover, foundational skills represent the starting point for successful reskilling or upskilling activities, as they allow adults to acquire new skills during their working life (OECD, 2021[32]). Indeed, the participation rate in formal or non-formal job-related training among low-skilled adults is 40 percentage points lower than among high-skilled adults (OECD, 2019[33]). When looking at differences by education level and orientation, data from the European Adult Education Survey show that adults with a tertiary education qualification have the highest participation rate in training. Adults with a VET qualification at the upper-secondary or post-secondary non-tertiary level have lower levels of participation than adults with a tertiary qualification or with a general upper-secondary qualification (Vandeweyer and Verhagen, 2020[34]).

Adults face various barriers when it comes to participation in education and training. The main reason for not participating in education or training mentioned by adults is a lack of interest (Figure 3.6, Panel A). Among those who are interested, the main reasons for not participating are shortage of time (for family or work-related reasons) and lack of financial resources to cover the costs of education and training (Figure 3.6, Panel B). Some of the obstacles are likely to be greater for formal than for non-formal education and training, as formal programmes are often lengthier, have stricter entry requirements in terms of qualifications and/or academic credentials, and can be costly in some countries.

Figure 3.6. Obstacles to participation in formal and non-formal education and training

Percentage of 25–64-year-old adults who completed initial education



Note: Belgium refers to Flanders only, the United Kingdom (in Panel A) to England and Northern Ireland. Panel B refers to individuals who are inactive but motivated and who are active and seeking more.
Source: OECD (2012[35]; 2015[36]; 2018[37]), Survey of Adult Skills (PIAAC) database, http://www.oecd.org/skills/piaac/publicdataandanalysis/.

Formal VET programmes could -in principle- play a key role in the upskilling and reskilling of adults, providing relevant and high-quality training opportunities. VET programmes are in many cases designed to respond to the needs of the labour market and can therefore provide opportunities for adults to develop the skills they need to stay current with the skill needs in their sector or occupation or to move between jobs. Moreover, formal VET programmes lead to formal qualifications and these programmes are generally supported by a well-developed and transparent quality assurance process. This allows adults to easily show to (prospective) employers what they have learnt. This is a key advantage over non-formal training, which is often difficult to navigate for learners and employers because of untransparent certification and quality assurance. Although non-formal programmes have mechanisms available for quality assurance, such as quality certificates, and (self)-evaluations, the information they convey is not always valuable, credible and accurate (OECD, 2021[38]).

However, as shown above, relatively few adults participate in formal VET programmes in most countries. One of the potential reasons is that the current offer of VET programmes does not necessarily cater to the needs of working adults searching for opportunities for upskilling and reskilling. In many cases, VET programmes are relatively long (especially compared to non-formal training), and usually delivered in a face-to-face mode, often during working hours, making them less compatible with working adults' schedules. As VET programmes usually have an important practical component – which generally requires face-to-face delivery-, it may be harder to organise these programmes in a flexible way. As discussed below, in many countries it is also difficult for individuals to have their previous learning and professional experience recognised towards a professional qualification, which makes VET and other formal education options less attractive to adults as not all of the content is relevant for them.

The lack of flexibility in VET could deter adults from enrolling in this type of programmes. While interesting innovations are appearing in the VET sector to make programmes more flexible (see remainder of this section), in many cases the sector is lagging behind compared to other parts of the education and training system. For example, education and training in the non-formal sector is becoming more flexible through the use of micro-credentials and hybrid modes of delivery (Kato, Galán-Muros and Weko, 2020[39]; OECD, 2021[40]). Likewise, higher education programmes in many institutions across OECD countries are becoming shorter, modularised and are increasingly being delivered online (European Consortium of Innovative Universities (ECIU), 2021[41]). Various countries are recognising the need to make VET more flexible to cater to the upskilling and reskilling needs of adults. In Norway, for example, the new Education Act (entering into force in August 2024) has enhanced the right to complete VET and the right to reskilling for adults, and the Act will secure more flexible pathways for adults in VET (Storinget, 2023[42]).

Modularising VET programmes

Modularisation can be beneficial to adults, employers and VET providers

By breaking up long programmes into shorter stackable pieces, the modularisation of VET programmes can allow adults to acquire the specific knowledge and skills that they are looking for in a flexible way (Box 3.2). It permits learners to have individualised training paths, which allows them to progress in training programmes at different stages of their professional life, also facilitating the mobility of learners across education and training providers (French, 2015[43]). Modularisation allows students to choose which modules to take and when to take them. They can choose to take up all the modules at their own pace to obtain the full qualification, or just to focus on one or a set of modules for which they can get part-qualifications or other forms of certification. However, in many cases some restrictions are imposed on the flexibility, especially in terms of the sequencing of modules, meaning that some modules can only be taken up by students who have completed other modules (or can demonstrate they have the skills related to those modules) (Box 3.3).

The flexibility that modularisation brings may in particularly benefit adult learners who dropped out from education and training and wish to complete the qualification at a later stage. To facilitate access of adults to education and training, Norway is currently developing new modular curricula in education and training for adults, whereby education and training is divided into smaller units – modules. Each curriculum consists of around five to seven modules. The implementation of the reform is planned for 2024 (Utdanningsdirectoratet, 2023[44]). Modularisation is also helpful for the organisation of curricula and to provide optional specialisation routes in those VET systems where the completion of a minimum number of credits leads to obtaining a VET qualification. In this case, usually each module represents a certain number of units of learning (or credits), depending on their length and complexity.

Box 3.2. What is modularisation in VET?

There is no single definition of modularisation. According to Pilz (2002[45]), in its "purest" state, modularisation has the following characteristics:

- The learning content is standardised in the curriculum, as well as the qualifications and the methods measuring their related learning outcomes. Learning outcomes are restricted, with clear boundaries in each module.
- It is possible to combine modules in a flexible way to acquire a qualification.
- Each unit and/or module can be assessed and certified. Assessment is oriented towards the output of the learning process.
- Participants have the possibility to freely enter and exit different modules at different stages of their training.
- VET providers, such as schools and training providers, can offer different types of modules.

A module in this context is a unit of work in a course of instruction that is usually self-contained. It is normally delivered by a method of teaching that is based on the building up of skills and knowledge in discrete units (Dejene, 2019[46]). Modules are usually stackable, so a module is a course that together with other related courses can constitute a particular area of specialisation (Dejene, 2019[46]). Modules normally lead to one or more possible qualifications, for which a number of units or modules are required to be completed, sometimes following a pre-specified sequence.

Different conditions in VET systems across countries could result in different meanings of modularisation and different shapes of modular systems (Pilz, 2002[45]). In practice, in most countries that have implemented some sort of modularisation, weaker forms of modularisation are present (Box 3.3). Despite the differences across countries, when implementing modularisation there must be a clear definition of what modules are or should be, and a good understanding of the advantages and challenges of developing, implementing and running modular programmes under that shared definition.

Modularisation provides flexibility not only to learners, but also to employers and training providers. When modular programmes are available, employers have more flexibility to train the workforce in those areas that suit their needs. Modularisation allows VET providers to adapt qualifications more easily to rapid changes in the labour market, for example to incorporate the utilisation of new equipment in line with industry standards for practical training (Cedefop, 2015[47]).

The introduction of modular and credit-based structures in VET is closely linked to the implementation of recognition and validation of non-formal and informal learning (Cedefop, 2015[47]), by which learners may be able to skip certain modules if they already have the relevant skills (see next subsection). This increases the flexibility of VET systems and the attractiveness of VET programmes to adults with relevant work experience.

Box 3.3. How does the sequencing of modules work when implementing modularisation in VET?

The defined sequencing of training modules in a VET programme can vary importantly across programmes of study. In some cases, when there are mandatory modules or units to acquire a qualification, these may need to be completed in a pre-specified order. For instance, in countries with strong dual systems, such as Switzerland, the off-the-job training provided in VET institutions is often highly structured, with modules following a pre-specified sequence, and optional modules are not always available. In some situations, one module works as a prerequisite for other more advanced modules in a similar subject. This is also the case when seeking specialisation within a specific trade.

In other cases there is more flexibility, but still a number of credits or units of learning must be completed when moving from one training stage or qualification level to another. In these cases, pre-requirements for the core modules exist, but there is more flexibility in taking standalone optional modules or even in choosing a specific "path" among core modules. For example, in Scotland (United Kingdom), each module is usually assessed separately, and a minimum number of credits or learning units (modules) per qualification need to be completed. The Scottish Credit and Qualification Framework (SCQF) articulates this modular approach, ensuring consistency and transparency across different types and levels of awards (Pilz and Canning, 2017[48]).

Fully flexible modular systems are usually not possible to implement, as core modules work as pre-requirements, for instance, when following a specialisation. However, some systems are aiming to make their programmes as flexible as possible, mostly through personalisation of learning paths and recognition of prior learning, on top of modularisation. For example, in the Finnish VET system, the goal is to have the least possible number of modules that work as prerequisites of others, to give students the largest possible flexibility when choosing their training options (although in practice, there are always some basic modules that work as pre-requisites). Competence modules can work as standalone courses, but can also be "stacked" to acquire a qualification, as Finland also operates a credit based system.[3] One or more competence modules can be recognised as achieved as part of an initial competence assessment, and each additional module can be taken with different providers or even prepared through self-study. VET providers are obliged to recognise prior learning, so in practice individuals can "mix and match" competence modules approved. Competence modules are also integrated in the Finnish National Framework for Qualifications and Other Competence Modules (Finnish National Agency for Education, 2021[49]).

Modularisation in VET can be challenging

There are complexities associated with the implementation of modularisation, including the question of sequencing (as described in Box 3.3). Designing a VET programme in a modular system is more complex, as learning outcomes and training activities must be described in a detailed way to avoid overlap between modules and ensure that individuals have the required competences to progress into higher-level modules. When implementing the modularisation of VET programmes, there must be a clear study path for learners. In this regard, the skills and knowledge that constitute a professional qualification, and the available pathways in terms of modules –or units of learning- that make up for them, should be explicit and easy to understand and navigate by (prospective) students. In several countries, this has been done by implementing competence-based programmes, where modules are designed around groups of verifiable competences. Competences are usually divided into technical competences –including practical and theoretical knowledge and skills- and generic competences, which are usually more transversal in nature and can be acquired across different modules. Competence-based programmes are often aligned to national occupational standards, which cover the expected knowledge and skills for individuals performing one or more occupations in different professional fields. In Scotland (UK), for example, vocational

qualifications are linked to minimum standards and are made up of units that reflect a set of learning outcomes (Box 3.5).

When implementing a modular system, learning outcomes in the different modules of a programme should be linked and mapped to initial requirements, as well as future or more advanced knowledge and skills, usually contained in higher-level (or specialisation) modules. A national qualification framework that recognises modules or groups of modules as valid credentials or credits towards a certain qualification allows to formalise the existing possible articulations across VET credentials and learning modules. It also simplifies prospective students' understanding about the possibilities for further studies, for instance, in postsecondary education. In Ireland, for example, the National Qualification Framework (NQF), describes what learners need to know, understand and be able to do to achieve each qualification. Each qualification is comprised of a set of modules, which can be accumulated into awards. As awards are essentially modular, a credit-based system enables learners to accumulate credit towards these awards on a gradual basis. The National Qualification Framework also sets out qualifications' pathways from one level to the next. This creates a transparent system of pre-requirements based on qualification levels.

In order to articulate modules within the VET system and with other types of credentials, modules should be self-contained, reflecting a substantive amount of knowledge and skills that can be assessed in a standardised manner (see Box 3.4 for an example from France). In a modularised system, each module needs to be assessed separately, to allow individuals to navigate the different learning paths and VET qualifications that might be available to them. Moreover, there needs to be transparency with respect to what each modules entails, in terms of both contents covered and demonstrable competences. In this regard, assessment systems must accurately reflect the achievement of those minimum standards set for each module and qualification. In order to maintain the value of VET credentials in the labour market, there must be trust across stakeholders regarding what individuals are capable of doing after completing each module and certification, regardless of the VET provider and the type of programme undertaken by the student. In Ireland, for example, assessment takes place on the completion of modules and practical activities. There are written and oral examinations, as well as practical examinations in the vocational specialisms. In Scotland, the assessment of modules can be done based on assignments, case studies, on the job performance, portfolios or practical activities and projects (Scottish Qualifications Authority, 2017[50]).

Box 3.4. France's "blocks of competences"

France started the introduction of modular programmes in professional training in 2014, when a new law on vocational training included the concept of "blocks of competences" (*blocs de compétences*) as part of professional certifications. Since then, the National Commission for Professional Certification (CNCP) and the National Joint Interprofessional Committee for Employment and training (Copanef), aimed at setting up the principles and elements allowing the traceability and use of blocks of competences. In 2018, the regulation was further modified, making the use of block of competencies the new norm for most professional training. Since then, most professional qualifications and certificates must be structured in blocks in order to be registered with the National Commission for Professional Certification (France Competences, 2019[51]).

In the aforementioned legislation, blocks of competences are defined as "a coherent and homogenous set of skills that can contribute to the autonomous exercise of a professional activity, that can be assessed and validated". Each block corresponds to a list of skills to be acquired. A block corresponds to a key professional activity of the profession (or several activities), which can be transversal or specific. There may be common core blocks and optional blocks.

To certify blocks (CPNEFSV, 2019[52]):

- Each block of competences should be assessed separately during one or more examinations. Assessments must be completed in events that are different and independent.
- The evaluation of each block requires the organisation of a jury, composed in whole or in part by professionals from outside the teaching team. Depending on the type of test chosen, the jury is not necessarily present during the proceedings.
- Before assessing a block of competences, it is possible to request previous blocks as a prerequisites (e.g. obtain block n°1 to be able to obtain block n°2).
- Candidates receive an individual certificate after the successful assessment of each block. The candidate obtains a full certification when he validates: 1) all the required blocks; 2) or, all the blocks plus one or more tests on transversal skills.
- A candidate can prepare certain blocks and apply for a validation of professional skills base on experience (*VAE, Validation des Acquis de l'Expérience*) for the full certification, or can focus on independent blocks not aiming for full certification (one or more blocks).

For instance, the Technician in Mechanical Studies (Level 4) professional certification is made up of three blocks of skills, each certified through a certificate of professional skills (CCP). According to the national directory of professional certifications (RNCP), the mechanical studies technician produces detailed study files for sub-assemblies of machines and equipment, to enable the industrialisation methods department to produce copies of the product that comply with the reference definition file. The three blocks to be completed to receive this certification are: 1) Model mechanical systems in 3D; 2) Study a mechanical system in quality assurance; and 3) Define mechanical parts in quality assurance (France Compétences, 2020[53]).

Modularisation of VET programmes can be a difficult exercise especially when implementing it for practical learning activities, for instance as part of apprenticeship programmes. Therefore, in some countries there is still some doubt regarding the feasibility and convenience of implementing modularisation in such VET programmes. As apprenticeships mainly consist of gradually developing professional skills on the job and involves a balanced combination of on-the-job and off-the-job training, structuring a learning sequence to meet a modular structure can be challenging, time consuming and sometimes costly. Ideally, the modularisation of apprenticeship programmes implies an individualised professional learning plan for all apprentices, and continuous co-ordination between VET providers and those companies offering the apprenticeships. This may increase the associated training cost for a single apprentice, and require, for example, information systems to co-ordinate the work of VET providers and apprenticeship companies to share information on learners.

On top of the practical reasons, some VET stakeholders such as trade associations, employers or VET providers consider that a modularised apprenticeship programme will not necessarily lead to the same qualified professionals than a regular apprenticeship programme. In their views, the outcome from the addition of all modules at different points in time (and sometimes with different providers) would not be the same as that of a full holistic apprenticeship programme, delivered over a fixed period of time and based on a stable agreement between a training provider and the training company. In some countries, companies are sceptical about training understood as “building blocks”. Therefore, not all training modules are recognised by training companies and employer associations which can limit students’ mobility across training institutions (Cedefop, 2015[47]).

Given these and other complexities of implementing fully modular programmes, in several countries elements of modularisation are present, but only for the elective components of VET programmes. Moreover, when modules exist they often involve many different topics or units of study, so in reality they refer more to alternative tracks as opposed to learning (or training) modules. In other cases, modules exist, but there is no assessment, credential or qualification associated to them, which may mean that they have limited value in the labour market and/or cannot be used as credits (or validated modules) to pursue further studies or acquire other qualifications.

Box 3.5. Scotland's modular apprenticeship programme

In Scotland (UK), modern apprenticeships[4] are all designed to deliver a training package around a minimum standard of competence defined by employers. There are more than 70 different Modern Apprenticeship Frameworks. Each apprenticeship programme is comprised of up to three elements: A Scottish Vocational Qualification (SVQ), a set of five core skills, and industry specific training (in some cases) (Skills Development Scotland, 2018[54]).

SVQs are normally made up of between six and ten units (modules), although some qualifications can involve more units. Units break a job down into separate functions reflecting the different kinds of activities. Each unit has its own aims and a list of learning outcomes and the assessment criteria used to verify them. For example, a vocational qualification for Vehicle Maintenance and Repair (Sottish Qualification Framework Level 5) is composed of 16 mandatory units and two optional units. For instance, there is a unit on "Skills in materials, fabrication, tools and measuring devices used in the automotive environment", with four learning outcomes,[5] each one of them with descriptors on what the learner is able to do.[6] Each modern apprentice is required to achieve the following core skills: communication; working with others, problem solving; information technology and numeracy.

While the flexibility brought by modularisation can make VET more accessible and attractive, there is also a risk that it makes the system complex and hard to navigate. Learners may need additional support to be able to select the most suitable modules and design a pathway that suits their needs and interests. In Finland, for example, a personal competencies programme is drawn up for all VET learns at the beginning of their programme. The plan charts and recognises the skills previously acquired by the student and outlines what kind of competences the student needs and how they will be acquired in different learning environments (Box 3.6) (Finnish National Agency for Education, 2019[55]).

Box 3.6. Modularisation of VET in Finland

Finland's VET system went through an important reform in recent years, moving from a supply-oriented approach into a demand-driven approach, which included the implementation of modularisation, and a competence-based framework to acquire vocational qualifications, while also updating the offer of VET programmes.

There are three types of qualifications: vocational qualifications (initial vocational qualifications, usually acquired in upper secondary education), further vocational qualifications and specialist vocational qualifications (post-secondary, non-tertiary level) (Finnish National Agency for Education, 2019[55]). Qualifications are the same for young people and adults. Qualifications are based on occupational standards which describe competence requirements. Since 2018, the Finnish system has 164 vocational qualifications, with access to different specialisations within qualifications (Cedefop, 2016[56]).

A modular approach has been implemented in most VET qualifications. The skills required to complete a module can be acquired at the vocational institution, on the job, or elsewhere (Cedefop, 2016[56]). Individuals must show the competences included in the national qualification requirements. Students demonstrate their skills in competence demonstrations at practical work (Finnish National Agency for Education, 2019[55]). The modularised approach in this cases has the following characteristics:

- All qualifications are composed of units of learning outcomes.
- Vocational qualifications consist of vocational units and common units.
- Units and the necessity for common units is assessed when preparing a personal competence development plan.
- Vocational units are either compulsory or optional.
- Further and specialist qualifications comprise only vocational units.
- Students can complete entire qualifications, parts of them or smaller units, or combine parts of different qualifications based on their needs.

For each student, a personal competence development plan is prepared. The plan is drawn up by a teacher or guidance counsellor together with the student and, when applicable, a representative of their working environment. The plan maps and recognises the skills previously acquired by the student, and outlines the type of competences the student needs and how they will be acquired in different learning environments (Finnish National Agency for Education, 2019[55]). Education and training organised at the workplace is planned as part of the personal competence development plan, taking into account the competence needs of the trainees and the workplace.

Microcredentials can make modularisation more effective

Modularisation of education and training programmes has gained traction in recent years with the introduction of microcredentials, as it provides a way to certify the learnings from the modules or even parts of modules. Micro-credentials provide learners with a certification of the learning acquired and capture their results (see Box 3.7 for a definition). They give additional flexibility to individuals to adapt learning paths to their needs, fostering inclusion and employability in the labour market, and supporting job transitions (European Commission, 2020[57]). Internationally, micro-credentials are seen as a way to support effective lifelong learning (UNESCO, 2021[58]; European Commission, 2020[57]), and their use has increased importantly in recent years - especially in higher education (OECD, 2021[59]). Many tertiary education institutions offer microcredentials and recognise them as credits or modules towards existing qualifications. This provides students with the opportunity to continue further studies in the same or other tertiary education institutions.

In many countries there is significant interest from employers in training staff using short programmes that provide micro-credentials, as an alternative to full qualifications. They are seen as being particularly useful for upgrading employees' skillset for the use of new technologies, also allowing employers to train workers for the parts of qualifications that are most relevant in the workplace at the time (Colleges and Institutes Canada, 2021[60]; Commonwealth of Australia, Department of the Prime Minister and Cabinet, 2019[61]).

Although up to now microcredentials have been mostly associated to university programmes and technology companies, they are also finding their way into the VET sector. Microcredentials can in principle be implemented in VET in most fields of study, including for transversal skills and job-related or discipline-specific skills (Colleges and Institutes Canada, 2021[60]). In some countries with a modular system that provides part-qualifications and certificates, micro-credentials have existed for several years under different names. In countries like Ireland or Scotland, for instance, part-qualifications date back to the beginning of the 2000s, when modularisation took place and national qualification frameworks were established. Today, in countries like Ireland, New Zealand and Australia, institutes of technology and

further education institutions offer microcredentials in the VET sector that may be credited towards a nationally recognised qualification. These countries have implemented them in areas such as education, agriculture, health, engineering and construction. For example, in Australia, in the construction sector, micro-credentials exist for the training of cut-off saw operators, as well as tunnelling support workers. In the engineering sector, micro-credentials are being offered by VET institutions in Canada in the area of maintenance of electric vehicles for mining operations.

Box 3.7. What are microcredentials?

There are several (proposed) definitions of microcredentials available, including the following:

- 'Micro-credential' means the record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes have been assessed against transparent and clearly defined standards. Courses leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs. Micro-credentials are owned by the learner, can be shared and are portable. They may be standalone or combined into larger credentials. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity (European Commission, 2021[62]).
- A micro-credential is a record of focused learning achievement verifying what the learner knows, understands or can do; includes assessment based on clearly defined standards and is awarded by a trusted provider; has stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition of prior learning; and meets the standards required by relevant quality assurance (UNESCO, 2021[58]).

Most definitions of microcredentials refer to them as a proof of the learning outcomes and skills that a learner has acquired following a short learning experience. Learning outcomes are clearly systematised and assessed against transparent standards using predefined examination systems. They refer to a specific set of knowledge and skills that can be stacked with other similar certifications, and sometimes recognised towards an academic degree or VET qualification.

In order to achieve the full potential of micro-credentials, there must be a common understanding of what each micro-credential entails, in terms of contents and learning outcomes. This information is essential to give employers more clarity about what is expected from the individuals holding these credentials, regardless of the institutions or companies issuing them. This needs to be accompanied by transparent and reliable assessment systems to certify that the competences mentioned have been acquired by those finalising the courses or modules. In countries like Ireland, for example, micro-credentials are recognised as part of the national framework of qualifications (NFQ). This implies that the contents, learning outcomes and related qualification levels of micro-credentials are clearly established and can be compared to other qualifications acquired in the formal education and training system (Box 3.8). Another approach is taken in Australia, where the South Australian Training and Skills Commission endorses some micro-credentials to guarantee that the learning outcomes of these programmes meet current and future industry needs, and that learners will gain the relevant skills, knowledge and attributes that are required by industry within South Australia (South Australian Skills Commission, 2021[63]). In this case, micro-credentials are comprised of accredited training components, non-accredited training, or a combination of both.

Moreover, microcredentials should be stackable and portable, and possibly mapped to national qualification frameworks as a component or complement of "full qualifications" (see, for example the case of Ireland in Box 3.8). When microcredentials are designed as part of a progressive sequence of learning achievements, learners can make progress over time and aim to achieve a full learning module or even a qualification after the completion of one or more microcredentials. Moreover, the portability of microcredentials could increase the flexibility of VET, allowing individuals to acquire knowledge and skills that can be later used to gain more advanced credentials in similar subjects elsewhere. In countries like New Zealand, for example, this has been achieved by changing national regulations for short VET programmes and microcredentials (Box 3.8). These changes in regulation, and the integration of microcredentials into national qualification frameworks, facilitate the use of microcredentials, by providing a legal framework that makes these credentials recognised and providing regulation in terms of their structure, length, contents and learning outcomes.

Box 3.8. The use of micro-credentials in VET in Ireland and New Zealand

Ireland: Including microcredentials in the national qualifications framework

While the term microcredentials is fairly new, the infrastructure for small post-secondary and tertiary qualifications has long been available in Ireland. Microcredentials can be offered as stand-alone, stackable and portable qualifications, and most of them are being included within the National Framework of Qualifications, underpinned by quality assurance mechanisms. In the current qualification framework, microcredentials are usually classified as "Minor Awards" or "Special Purpose Awards" particularly in Further Education and Training. The majority of these credentials correspond to 10-30 ECTS credits and are delivered on a part-time basis. They are mostly offered by private higher education colleges, private further education (FE) providers, universities, institutes of technology, and education and training boards. They are delivered in both vocational and non-vocational fields. The Irish Register of Qualifications (IRQ) contains more than 10 000 programmes/courses, from which more than 1 000 are higher education and further education programmes of less than 30 ECTS credits (Quality and Qualifications Ireland, 2021[64]).

By unpacking existing programmes into independent or "bite-sized" components, education providers are redesigning and expanding their offer of education using microcredentials. In recent years, there are clear signals that the tertiary sector is looking to further expand the use of microcredentials. For instance, in 2021 the Quality and Qualification Ireland (QQI) Programmes and Awards Executive Committee approved new microcredential courses for a large set of disciplines using a streamlined approach for the rapid validation of microcredentials arising from modules of previously validated programmes (Kelly, 2021[65]). Moreover, private providers have also requested that this approach to be extended to include new programmes or to modify existing modules from previously validated programmes. The movement towards smaller credentials has been boosted by COVID-19 restrictions in Ireland, which accelerated the process of adoption of blended learning delivery in educational institutions, adapting their programmes to online approaches of teaching and learning, assessment and certification, making learners experience more accessible and flexible.

A National Employer Survey in Ireland (2018) suggested that "complementary credentials" were supporting employers' efforts to address the gap between the knowledge and skills needed in the labour market and those available in the labour force.

New Zealand: Regulating microcredentials

In New Zealand, micro-credentials are now formally included in the New Zealand Qualifications Framework. Based on new regulation, the New Zealand Qualifications Authority (NZQA) introduced a micro-credential system as part of the country's regulated education and training system. The new legislation also simplified the micro-credential approval process, allowing newly established Workforce Development Councils, as well as VET providers and others, to develop micro-credentials, and replace training schemes with micro-credentials. At a minimum, micro-credentials are subject to the same requirements as training schemes or assessment standards and are also be required to: 1) be 5 to 40 credits in size; 2) have strong evidence of need from employers, industry and/or community; 3) not duplicate current quality assured learning approved by NZQA, and 4) be reviewed annually to confirm they continue to meet their intended purpose (New Zealand Qualifications Authority, 2020[66]). There are more than 200 approved micro-credentials including qualifications in the fields of farming, veterinary, administration, transport, construction, health, hospitality and IT, with most credentials between 5 and 20 credits (New Zealand Qualifications Authority, 2022[67]).

Recognising and validating prior learning

Recognition of prior learning can make VET more accessible

Recognition of prior learning is a powerful tool that permits adults to shorten their training programmes based on their already developed skills. It allows them to get their theoretical and practical knowledge and skills recognised and validated, so that their training can focus on closing remaining skill gaps. When implemented in a modularised system, RPL gives learners the opportunity to skip certain modules or units of learning included in the curriculum of VET programmes, based on their experience and subject knowledge. In some case, recognition of prior learning can be used to directly obtain the full qualification without having to go through additional training.

Skill recognition not only shortens the amount of time needed to acquire a qualification, but also reduces the monetary costs associated with training and obtaining a qualification. This cost is particularly high to working adults, as apart from the direct cost of training, the opportunity cost of not being in their current employment is higher, especially for individuals with higher qualifications (Kis and Windisch, 2018[68]). Moreover, the prospect of obtaining a qualification in recognition of skills developed while in the workplace incentivises workers to engage in acquiring new skills on the job, as they can gain benefits in terms of their employment outcomes (Kis and Windisch, 2018[68]).

Moreover, in some cases RPL allows adults to recognise or partially validate their qualifications and experience acquired abroad, facilitating workers' mobility in the labour market and the integration of workers from a migrant background. In those cases, RPL is often facilitated by initial skills assessments, which are initial screening activities performed at the beginning of RPL processes (or as part of job search or career guidance activities), that enable host countries to learn about the knowledge and skills that migrants bring with them, so they can inform their policy decisions. These assessments and further career guidance also provide valuable information that helps migrant workers make decisions about their future, including recognition of prior learning and available education and training pathways for adults (Jeon, 2019[23]).

Recognition of prior learning can make use of written examinations and/or portfolios that document prior learning and skills, as well as formal face-to-face competence demonstrations overseen by experts from industry (Box 3.9).

Box 3.9. Recognition of prior learning in practice

According to Kis and Windisch (2018[68]), recognition of prior learning usually leads to three separate possible outcomes: i) admission into an education or training programme; ii) reduced programme duration in further studies; and iii) acquiring a qualification without a required training programme. Depending on the country one or up to all three outcomes are possible.

In order to follow any of these three pathways, previous learning must be validated before being recognised by official qualification bodies. Validation is defined as the process of confirmation by an authorised body that an individual has acquired learning outcomes measured against a relevant standard. In short, validation makes learning visible and gives it value (Kis and Windisch, 2018[68]).

Different countries have different validation systems, although some common elements are usually present. For instance, in many countries the validation process usually involves the completion of a portfolio showing evidence of knowledge and skills. This could involve the provision of documentation about education and training activities undertaken in the past and their results. It could also include curricular contents covered, and examination results for one or more units of learning. In other cases the validation process requires proof of skills by means of a standardised assessment of a core set of knowledge and skills pre-specified by an official body. When assessing vocational skills, this proof of skill (or competence demonstration) usually takes place in a work environment.

Structural and practical obstacles impede effective implementation and use of RPL

In practice, in many countries the rigidity of the curricula and of the validation and assessment systems in VET, make it difficult for adults to use the qualification system to their benefit when engaging in VET. Boundaries between formal and non-formal education hinder smooth recognition and validation of skills and certificates. Because of the difficulties in implementing recognition of previous learning, those who design and deliver VET do not innovate in their offer and practices –maintaining a set of traditional programmes with rigid examination systems- so students in practice cannot necessarily benefit from the flexibility of modular programmes and recognition of prior learning.

Also on a more practical level, the design of the RPL procedures could present an obstacle to adult learners who could potentially benefit from it. In many countries, it is not possible to recognise prior learning in an easy way. Often the process requires the applicant to sit an examination and/or produce a portfolio, providing written answers by the applicant to a set of questions organised in different pre-defined forms, as well as complementary documentation as a proof of learning and competence. The administrative procedures usually involve an expert in the profession assessing each competence or subject separately. The validation is competence- and knowledge-based, and can only be completed when all competences have been shown and the practical experience component of the qualification has been completed or validated. One of the outcomes of the validation process can be that individuals need to undertake additional training in specific topics, or gain additional practical experience in the labour market covering certain occupational skills. Since the outcomes of the validation process are very uncertain, and the administrative procedures are lengthy and complex, in practice today in many countries adults decide to take the full programme instead of going through RPL. This reduces the appeal of VET as a path for professional development. When considering VET training and the option on RPL, adults need to have a clear understanding of the entire process or recognition of skills, the possible outcomes of their applications, and the expected timeline before the process is completed. Moreover, VET systems need to make sure that the process is easy, minimising the administration involved.

In most countries vocational institutions are in charge of undertaking the process, and often they have different systems in place for such purpose. To facilitate the use of RPL, a standardised system of

recognition of prior learning, that can be utilised by all institutions, can help to make the process more transparent. In countries like Finland and Portugal there are national protocols backed by information systems available to vocational institutions and individuals interested in entering RPL processes (Karttunen, 2019[69]; Guimarães, 2019[70]). Moreover, when possible, the recognition of prior learning should be centralised, so learners do not need to undertake the same process in different institutions. In Portugal, *Qualifica Centres* are in charge of the implementation of RPL (Box 3.10). In order for RPL to be successfully implemented and to ensure that the credentials issued are valued in the labour market, it is fundamental that the existing qualifications and RPL processes are underpinned by quality assurance systems. In this regard national qualification frameworks can play and important role in supporting the quality of RPL systems, as they provide an institutional structure, a set of pre-defined credentials and shared competences standards.

Another way to make the process more transparent is to make detailed competence profiles for VET courses or occupations available. This helps learners understand what skills are required to be certified at the end of the programme, and hence what skills could potentially be recognised and validated towards a qualification. In countries like Ireland and Portugal this is done by including qualifications in National Qualification Frameworks or by developing competences standards used for RPL activities (Guimarães, 2019[70]; Murphy, 2019[71]).

Box 3.10. Portugal's Qualifica Centres

In Portugal, the validation of non-formal and informal learning for adults is integrated into the national education and training system through *Qualifica Centres*. They provide information and guidance to adults, refer adults to relevant training, and also implement RPL (RVCC - *Reconhecimento, Validação e Certificação de Competências*), acquired in formal, non-formal or informal contexts (OECD, 2021[72]). The National Agency for Qualification and Vocational Education and Training (ANQEP) is the main agency responsible for monitoring the performance of Qualifica Centres and providing support and technical guidance to them. Qualifica Centres report to the ANQEP and implement its guidelines, but are independent in their daily work.

There are 310 Qualifica Centres across Portugal. Most of them are related to sectoral training organisations, as well as a wide range of education providers, including regular general schools, VET centres, town halls and local development associations. When established, the Qualifica Programme had three main goals to be reached by 2020: i) 50% of the workforce finishing upper secondary education; ii) 15% of adults taking part in lifelong learning activities; and iii) 40% of adults aged 30-34 having obtained a higher education certificate (OECD, 2021[72]).

The validation of prior learning processes (RVCC) are based on pre-defined Key Competence Standards (*Referenciais de Competências-Chave*). Adults interested in undertaking RPL usually need to produce a portfolio, which is presented to a jury during the certification assessments, and undertake an examination. For the certification of school competences, the examination consists of an oral presentation to demonstrate key-competence areas of the respective standard. For the certification of professional competences, the examination is a practical demonstration of the competences included in the professional competence standard (Guimarães, 2019[70]).

As part of their work, Qualifica Centres developed the Qualifica Passport, an online tool, that allows adults to record their qualifications and skills, assisting them in identifying possible further learning pathways. In addition, the Qualifica Programme established a National Credit System for VET, based on the European Credit System for Vocational Education and Training (ECVET) (OECD, 2021[72]).

Individuals undertaking RPL may require support to embark on the RPL process, in order to better understand their options and the RPL procedures and to be able to go thought the (sometime lengthy and burdensome) process. In Finland, a personal competence development plan is drawn up for all VET learners at the start of their programmes and this includes the demonstration and validation of skills (Box 3.11). In France, a dedicated RPL leave (*congé de VAE*) programme provides a paid absence from work, authorised by the employer, to allow individuals with more than one year of experience to prepare for the validation of learning and experience acquired on the job or elsewhere. The goal of the RPL process for which the leave can be used is for individuals to obtain a diploma, a professional title or certificate of professional qualification (MaFormation, 2021[73]).

When the outcome of the validation process involves undertaking additional training in specific topics, this should be facilitated by education and training systems that incorporate bite-sized training modules, certificates and qualifications to make the training process shorter and more efficient for the applicant. Adults may need guidance to help them find the right training and available support measures. In countries like the Netherlands, Portugal, Spain, Finland and Switzerland, the RPL process is usually accompanied by a counsellor or a tutor, provided by the educational institution where the validation process is taking place or by external public bodies (Duvekot, 2019[74]; Guimarães, 2019[70]; Vale, 2019[75]; Karttunen, 2019[69]; Salini, Weber Guisan and Tsandev, 2019[76]).

An additional issue related to the recognition of prior learning is the capacity of VET providers to develop and implement the procedures, as well as to inform the public about the options available. This involves additional costs on the side of the provider, which are usually not directly covered by public funds. Moreover, VET providers could be discouraged from broadly implementing RPL, as this could imply less funding received per student, depending on the criteria used for allocating funds (e.g. funding per module, programme credits or length of the programme). Given the economic benefits that RPL brings to individuals and society, VET institutions should be encouraged to make this service widely available. Tying public funding to the availability and use of RPL could be one way to encourage the implementation of RPL by VET providers. Likewise, mechanisms to partially cover the costs associated with the validation process could help in bringing VET providers on board. For example, in countries like Finland, Italy and Spain recognition procedures are mainly funded by national and regional public authorities or by VET providers (Vale, 2019[75]; Perulli, 2019[77]; Karttunen, 2019[69]). Also, mechanisms to offset negative financial incentives (such as funding based on the length of a students' programme or the number of students enrolled) should be in place when needed. In Finland, this is done by providing funding not only based on the number of enrolled students, but also on the number of qualifications or parts of qualifications issued, as well as on graduates' employment outcomes or continuation to further studies after their certification (Karttunen, 2019[69]).

Box 3.11. Competence demonstrations: recognition of prior learning in Finland

In Finland, the validation of prior learning has gone through important changes in recent years. In 2018, a major VET reform was implemented, which included a simplification of the qualification system via changes in legislation. As a result, there were important modifications in the RPL assessment procedures and certification processes. The new regulation established the principle that "full and partial competence-based upper secondary, further and specialist vocational qualifications can be awarded regardless of how and where the competences and knowledge have been acquired" (EURYDICE, 2022[78]).

Under this new regulation, qualifications are completed through competence demonstrations. Vocational skills are primarily demonstrated in practical work situations at workplaces, and competences are assessed per module of a qualification or preparatory education. Hence, under the revised protocol, VET providers lead RPL processes, which are mainly based on competence demonstrations (previously RPL was lead by an independent body called Qualification Committee). In competence demonstrations, the student's competence is assessed by a teacher and a representative of working life from an organisation that represents the field of the qualification in question (bipartite assessment system). These representatives are part of one of the 40 newly established Working Life Committees which are in charge of the quality assurance during the RPL process, by monitoring the results and providing feedback to VET providers (Karttunen, 2019[69]).

For most students, the recognition of skills process initiates with a personal competence development plan, which is drawn up for each VET learner at the beginning of their VET programme (both in initial and continuing education), usually within the first weeks. This plan is commonly produced by a VET teacher or guidance counsellor and the learner. When applicable the drafting of the plan can also involve a representative from the world of work (in case an apprenticeship training is part of the programme). The personal competence development plan includes: i) identification and recognition of prior learning; ii) learner's missing skills based on qualification requirements; iii) competence demonstrations and other demonstrations of skills to be organised; and iv) guidance and support that may be needed by the learner (EURYDICE, 2022[78]).

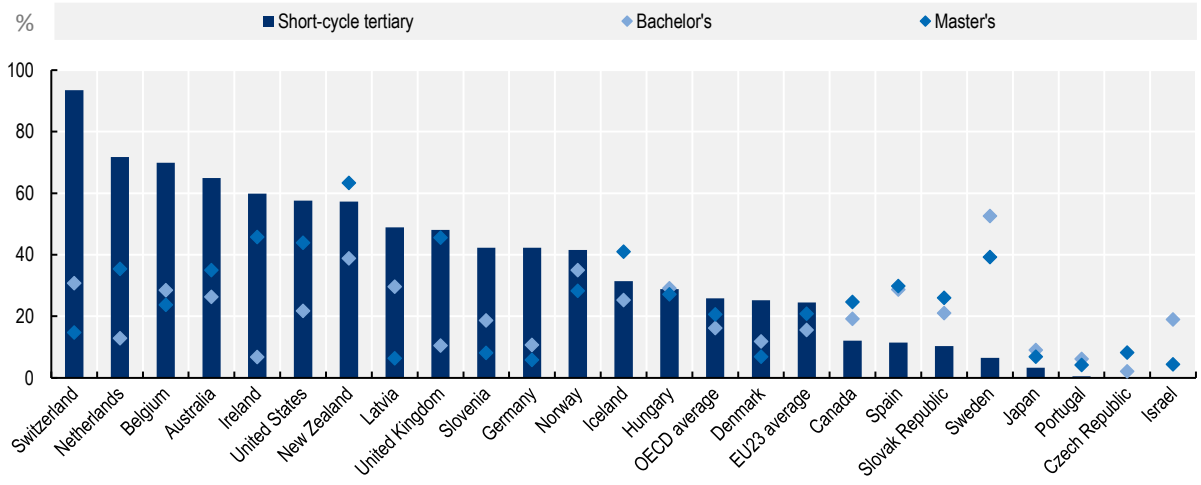
Students initially discuss the procedure for skills demonstrations with the teacher who will assess the skills. Later on, the learner completes an application using an information system commonly administrated by the VET institution, including a demonstration plan. After the application has been accepted, the assessment takes place according to the skills demonstration plan, and the teacher and work life representative provide a grade based on the skills demonstration.

Offering part-time and distance learning opportunities

As adults often face time constraints, organising training as part-time programmes and providing online or hybrid training delivery facilitates access to education and training. Moreover, online delivery can be attractive for adults living far away from training facilities, and for those who are not keen on learning in a standard classroom setting. Part-time programmes are popular among VET students in certain programmes. For example, on average across OECD countries with available data, around 28% of students in short-cycle tertiary programmes were undertaking part-time studies (Figure 3.7). In countries like Australia, Belgium, Ireland, the Netherlands, New Zealand, Switzerland and the United States, more than 50% of students in short-cycle tertiary programme studied part-time. This proportion is higher than for other types of tertiary programmes in most countries.

Part-time education allows people to work at the same time as studying, and in some cases this can create links between their employment and their training programme, enriching their learning experience. In Denmark, for example, part-time programmes require at least two years of work experience in the same sector. Students continue to work while studying, and their programme activities are linked to their employment. For instance, the assignments or projects they are involved in are based on real-life problems they experience in the workplace (OECD, 2022[79]).

Figure 3.7. Share of part-time students enrolled in tertiary education, by type of programme (2017)



Note: For Canada private institutions at short-cycle tertiary level are excluded.
Source: OECD (2019[80]), *Education at a Glance 2019: OECD Indicators*, https://doi.org/10.1787/f8d7880d-en.

Many VET programmes are designed to be delivered in a predominantly face-to-face format, and online or hybrid learning has been less common in VET than in general or academic programmes. This is mostly related to the fact that practice-oriented skills are more prominent in VET curricula, and many VET programmes include periods of training in companies or in workshops. A survey among VET providers around the world showed that only 30% of VET providers in Europe and Central Asia and in the Americas very often or regularly used online and/or distance learning before the COVID-19 pandemic (ILO, World Bank, UNESCO, 2021[81]). In Australia, only 19% of the 1 200 courses delivered in Technical and Further Education (TAFE) institutes had some form of digital delivery before the pandemic (TAFE Directors Australia, 2020[82]). The COVID-19 crisis spurred VET providers to adjust their practices and the curricula of their training programmes to deliver larger components of VET qualifications online. Although this applied mostly to non-practical learning activities, it showed that hybrid learning in VET is possible - with online learning being considered as a valuable option for vocational studies in most countries (OECD, 2021[13]). In many countries, additional support was provided during the pandemic to help VET teachers develop the skills needed to teach in an online setting (OECD, 2021[13]).

Although some of the barriers to full online VET delivery remain, it is now more common to see VET programmes with arrangements where practice-oriented modules take place in a concentrated way, and most of the theoretical knowledge and joint learning activities can be delivered remotely. Today VET institutions are in an improved position to implement distance learning, as they have developed institutional capabilities for blended learning, opening the door to a more flexible provision of VET. In Norway, for example, professional institutes offer short-cycle programs, lasting between 6 months and two years, often delivered in flexible training formats. Half of the programs are offered on line, while two-thirds of the students study part time and combine their studies with work (OECD, 2022[79]). Most of the students have a technical-professional degree at the secondary level, but adults without any qualifications can also access the programmes thanks to the recognition of the skills acquired through their previous work experience. In Chile, there is a wide variety of post-secondary and tertiary vocationally-oriented programmes available that use blended learning methodologies and part-time delivery for adults looking to upskill or reskill while on the job. These programmes are open to individuals with upper secondary VET qualifications, but also those who finished their secondary studies in general programmes (see Box 3.12 for an example). The development and adoption of new technologies, such as virtual reality, augmented reality and simulators, can further advance online or hybrid learning in VET, facilitating the delivery of

practical learning. Such technologies can therefore help increase the under-developed distance learning opportunities in VET. This is discussed in Chapter 5.

The use of online courses (including those leading to microcredentials) to respond to labour market needs and ensure continuity of VET during the COVD-19 crisis, has raised concerns among employers and policy makers regarding the quality VET delivered on line (OECD, 2021[13]). In order for VET credentials acquired online to be valid and valued by external stakeholders, especially employers, online learning courses must be subject to the same quality assurance processes as regular VET programmes included in national qualification frameworks. Moreover, governments and quality assurance agencies need to support VET institutions and promote quality assurance activities, establishing clear regulations and promoting a strong evaluation culture within institutions, which takes into account, for example, employer/trainer assessments, labour market outcomes and students' satisfaction with their online training.

Box 3.12. DUOC UC-Chile: Blended learning programmes in a modularised system

DUOC UC is one of the two biggest providers of postsecondary VET in Chile (professional institutes). It has a flexible education model, offering VET programmes in a blended learning format. The blended format (b-learning) combines face-to-face afternoon sessions with online classes. The curricula put emphasis on personalised activities, with the goal to develop various technical and transversal competences. The face-to-face time is optimised in activities of analysis, debate, reflection, demonstration and application of the skills acquired.

The students have access to support resources that facilitate and guide them during their studies, such as a tutor, and a schedule of activities for each subject. The programmes of study have a modularised approach, which allows students to obtain one or more professional certificates after a group of modules of a specific vocational subject are completed. The completion of predefined mandatory modules and electives modules also leads to a technical degree (involving two or four years of study).

Source: DUOC UC (2021[83]), Carreras en Formato Semipresencial, www.duoc.cl/oferta-academica/formato-semipresencial/.

Providing preparatory courses and increasing the flexibility of entry requirements

To be able to enter VET programmes, individuals are usually required to have completed a certain level of education or possess minimum foundational skills. This may disincentivise adults to participate in VET, especially those with lower levels of qualifications and skills – who are arguably most in need of upskilling and reskilling (OECD, 2019[84]).

As previously discussed, across OECD countries a large proportion of adults have foundational skills gaps. These skills are fundamental in the labour market and in society more broadly, and they are crucial for developing higher-level skills. In this context, VET systems should meet the needs of adults with foundational skills gaps. One way of approaching this issue is to provide short introductory training programmes, specifically tailored to those adults who are interested in VET. These programmes are usually focused on building the foundational skills that are essential for successful engagement in VET. These training courses can include basic maths and language skills (see Box 3.13 for the case of Denmark), and also basic digital skills. Basic skills programmes can be delivered before the learner starts a VET programme, but can also delivered alongside the VET programme to avoid increasing the duration of training. In some cases, these programmes lead to basic certifications that can later be used to access higher-level VET programmes. The certifications can also work as a "taster" for adults who are disengaged from lifelong learning activities, including formal training. By allowing adults with lower skills to acquire key basic competences while they are undertaking their VET studies, the VET system can be made more inclusive and accessible.

Box 3.13. Admission to vocational education and training for adults in Denmark

In Denmark, adults over the age of 25 can achieve a basic VET qualification (equivalent to upper secondary level), through a VET programme for adults, called EUV. The main advantage of these programmes is that learners can skip the practical or basic component of their course depending on their personal situation. This can shorten the length of their programmes significantly.

The two main requirements for adults to enter EUV programmes are: i) having achieved the equivalent of lower secondary education, ii) having at least two years of work experience. In addition to lower secondary education, applicants must document their maths and language skills. Learners applying for admission are required to achieve an exam grade average equivalent to 2.0 or higher in the subjects of mathematics and the language of instruction (usually Danish or English). However, applicants not meeting this requirement can have access to a course in Danish, Danish as a second language and/or mathematics at the VET institution where they are applying for admission.

Source: Ministry of Children and Education (2019[85]), Vocational education and training in Denmark, https://eng.uvm.dk/upper-secondary-education/vocational-education-and-training-in-denmark; Ministry of Higher Education and Science (2022[86]), Admission to vocational education and training (VET), https://ufm.dk/en/education/recognition-and-transparency/recognition-guide/admission-vet.

Several countries provide "pre-apprenticeship programmes", where students can also learn basic job-related skills in an industry setting associated to the professions of their future vocational studies (as also discussed in one of the previous sections). In some cases, dedicated pre-apprenticeship programmes are set up for learners with a migrant background as a way to simultaneously close language skills gaps (see the Swiss INVOL programme described in Box 3.1).

Providing VET programmes dedicated to adults

The strategies described above for making VET more flexible can be applied to any type of VET programme. Indeed, countries can choose to make their entire VET system more flexible, which can make it more accessible to adults but also have benefits beyond that. Alternatively, countries may opt for a separate system or offer of VET programmes for adults that are more flexible than the programmes on offer for young learners. For example, Denmark has built a separate adult learning system, with different VET programmes and/or providers, but leading to the same qualifications as for youth. In this case, the course content, duration and delivery methods of a VET programme are specially tailored to adults.

VET programmes for adults come in many shapes and forms, and include full-time apprenticeships programmes for adults, short-cycle tertiary evening VET programmes, or short specialisation courses for adults. Box 3.14 provides examples of dedicated adult VET programmes in Denmark and Sweden. Moreover, some VET programmes are designed for those who already have relevant work experience, hold a VET qualification or a higher education degree. One particular example of such programmes are professional examinations, which exist in several OECD countries and yield qualifications at several tertiary levels depending on the country and target occupation (Chapter 2).

Box 3.14. Examples of adult VET programmes

Denmark: A separate adult VET track

Denmark provides VET courses to adults aged 25 and older (named, EUV or *Erhvervsuddannelser for voksne*). These are part of a separate track of VET provision designed for adults but leading to the same vocational qualifications as those for younger learners. Courses are organised on the basis of a prior learning assessment, which is implemented during the admission process. The outcomes of the assessment can result in: i) a shortened main course and no on-the-job training; ii) a basic course of up to 20 weeks and a main course with shortened school-based time or iii) a course equivalent to a VET programme for young people. If adults enter a training agreement (such as an apprenticeship) with a company, the company pays their salaries during the training (Ministry of Children and Education, 2021[87]).

Sweden: Municipal adult education

In Sweden, municipalities are the main provider of adult education. Municipal adult education (*komvux*) is targeted at adults aged 20 and over who have not completed primary or upper-secondary education. Municipalities are legally obliged to offer this type of education. If a municipality does not provide a relevant course and the person attends adult education in another location, the home municipality pays its cost to the municipality or county council offering the education (Barnes et al., 2020[88]). Students in municipal adult education can work towards a diploma that is equivalent to upper-secondary school diploma, supplement earlier education to gain eligibility for higher education, and get vocational training (including apprenticeships). Learning goals of municipal adult education are the same as in upper-secondary education for youth but there are no nationally determined programmes. Instead, adults study one or more courses based on their specific needs and preconditions. Municipal adult education is free of charge for participants (Skolverket, 2021[89]; Eurydice, 2020[90]). In 2019, 4,3% of 20-64 year-olds or 387 000 students were enrolled in municipal adult education. Over 175 000 students studied at upper-secondary level (Barnes et al., 2020[88]).

Ensuring financial support is available for more flexible VET programmes

Adult learners often face financial barriers to access education and training opportunities. Although workers' training activities are sometimes supported by employers, there are many scenarios where this is not the case. For instance, when compared to large companies, SMEs are usually less likely to provide training opportunities to their employees (OECD, 2019[33]). Moreover, adults working on a part-time basis, or under temporary or other non-standard arrangements, have often lower support from their employer to engage in education and training. In many countries public funding is available for individuals to engage in training and for employers to provide or fund training, and often these financial support measures target particular groups of adults who have particular training needs (e.g. adults with low levels of qualifications, employers or workers in sectors undergoing structural changes) (OECD, 2019[33]). However, in some cases this funding is only available to pursue traditional VET programmes consisting of a certain minimum number of credits or hours of training (OECD, 2020[91]), which could mean that certain flexible programmes (such as modules) may not be covered.

Government and companies should provide financial support for a wide variety of education and training opportunities, as long as those opportunities are relevant for workers' skill development and meet minimum quality standards, regardless of their duration and mode of delivery. For instance, in countries like Denmark and Switzerland working adults are entitled to receive funding from the government to cover their part-time studies while they are in the labour market. In Switzerland, the Federal Act on the Taxation of Job-Related

Training and CET Costs stipulates that if an upper secondary-level leaving certificate has been obtained, working adults can access tax incentives for up to CHF 12 000 to cover the cost of training, with each canton setting their own limits (OECD, 2017[92]). This regulation covers all type of approved vocational training, regardless of duration, subject or mode of delivery (EURYDICE, 2021[93]).

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Notes

[1] Meaning that they score at or below level 1 in the OECD Survey of Adult Skills (PIAAC).

[2] Meaning that they had no computer experience, failed the ICT core test, or scored below-level one in the assessment of problem-solving skills in a technology-rich environment in the OECD Survey of Adult Skills (PIAAC).

[3] In a credit-based system each completed module (or finalised activity) represents a certain number of credits (the number of credits usually depends on the module's length and complexity). Qualifications are issued after completion of a minimum total number of credits, including core modules (usually mandatory), elective modules and additional examinations.

[4] Modern Apprenticeships offer those aged over 16 paid employment combined with the opportunity to train for jobs at craft, technician and management level.

[5] The learning outcomes in this unit are: 1) the correct selection, care and use of key hand tools and measuring devices for modification, fabrication and repair in the automotive environment; 2) the correct preparation and use of common work environment equipment ; 3) the correct selection and fabrication of materials used when modifying and repairing 4) the correct application of automotive engineering fabrication and fitting principles (City and Guilds, 2018[94]).

[6] For the learning outcome "the correct selection, care and use of key hand tools and measuring devices for modification, fabrication and repair in the automotive environment", the following selected assessment criteria are used: 1) maintain and use suitable hand tools safely when fabricating and fitting in the automotive workplace 2) select, maintain and use suitable measuring devices safely when fabricating and fitting in the automotive environment 3) select, maintain and use suitable PPE for fabrication, repair and fitting in the automotive environment; 4) select, maintain and use suitable electrical measuring tools safely when repairing vehicles and components (City and Guilds, 2018[94]).

4 Vocational education and training to support transitions

This chapter looks at how vocational education and training (VET) can support transitions of learners, both into the labour market and into further learning. It discusses the importance of solid foundational and transversal skills that make individuals adaptable in light of changing skill needs in labour markets and societies. It also looks at pathways between VET and higher levels of education and how such pathways can be made most effective to enable progression and lifelong learning. Lastly, the chapter discusses the importance of career guidance for informing young people and adults about learning and career opportunities.

Introduction

Structural changes in the labour market increase the chances that workers will need to change jobs or are faced with significant changes within their job. As discussed in Chapter 1, many jobs are likely to be impacted by the digital transition, as a variety of tasks can potentially be automated. Likewise, the green transition will change production and working methods, as well as lead to job losses in certain (polluting) sectors. As such, most individuals will not be doing the exact same job for their entire career. Such changes call for individuals who are resilient and can adapt to new circumstances. This requires a solid set of transversal skills and a willingness to learn.

VET typically prepares individuals for the labour market, and in particular for one field, sector or occupation. VET programmes differ in how broad or narrow they are. Broader programmes have the advantage of preparing individuals for a number of different job roles, which can also make them more adaptable in light of change. However, in contrast to more narrow programmes, they may not make learners job-ready and therefore make the transition from school to work less smooth. Related to this, VET programmes also differ in terms of the transversal content they include, with some focussing fairly narrowly on occupation-specific skills, and other also developing a range of transversal skills – including foundational skills. Such transversal skills can help individuals navigate changing labour markets and societies.

Being adaptable necessarily also implies being able and willing to continue to learn. As discussed in the previous chapters, lifelong learning becomes increasingly important. This requires individuals to have sufficient opportunities to participate in learning – including in VET-, as well as a readiness to learn. Without solid foundations to build on, adults cannot effectively engage in upskilling and reskilling. Therefore, all individuals need to have strong foundational skills, like literacy and numeracy, including those who come from VET. In addition to this solid basis, individuals also need to have a lifelong learning mindset, i.e. an understanding of the importance of lifelong learning and interest to engage in it.

Navigating change can be difficult. Helping individuals, both young and older, understand ongoing and expected changes, and the implications they can have for them, is essential. Making sure they understand which tools are available to help them navigate these changes is equally important. As such, career guidance can be a powerful to help individuals understand how labour markets and societies are changing and how this affects skill needs, and support them in making informed education, training and career choices.

This chapter looks at how VET can contribute to developing strong transversal skills, including foundational skills. It also looks at pathways between VET and higher levels of learning to ensure that individuals who want to further develop their skills -potentially later in life- have the possibility of doing so. Lastly, the chapter also takes a close look at career guidance for young people and adults, and in particular how career guidance can be integrated into VET and guide future learners towards VET options.

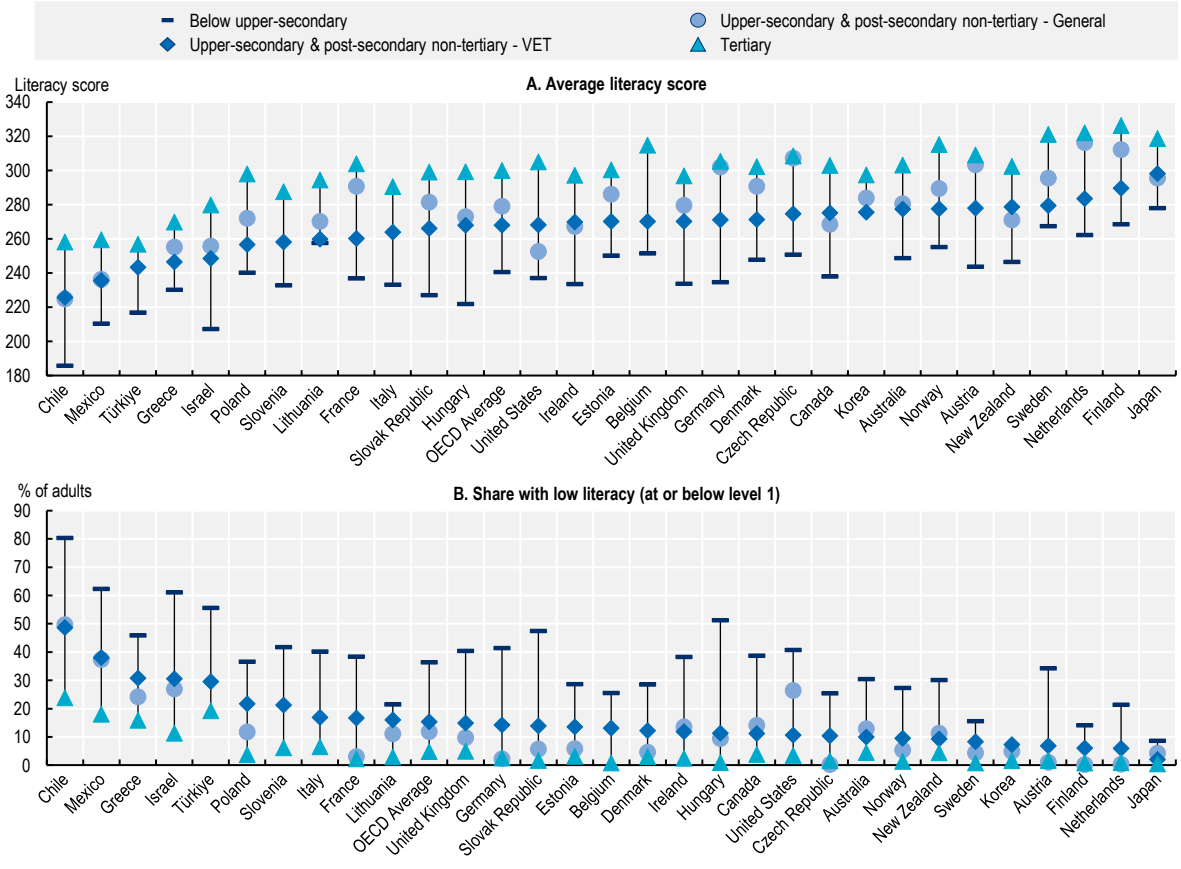
How can VET develop transversal skills?

As learners in VET typically prepare for a specific occupation, set of occupations or sector, transversal skills may be less prominent in VET curricula than in general education programmes. This could have implications for their adaptability and resilience down the line. Data on transversal skills are hard to come by, given the complexity of defining and assessing many of those skills. Nonetheless, the OECD Survey of Adult Skills (Programme for the International Assessment of Adult Competencies, PIAAC) sheds light on three important transversal skills: literacy, numeracy and digital problem-solving. Evidence from that survey shows that among young adults, those without an upper-secondary degree and those with upper-secondary or post-secondary non-tertiary VET qualifications (as their highest qualification) have the weakest literacy, numeracy and digital problem-solving proficiency (OECD, 2020[1]). For example, across OECD countries on average 15% of young adults with a vocational qualification lack basic literacy skills

(Figure 4.1), compared to 12% among those with a general qualification at the same level and only 5% among those with a tertiary qualification. Only in Canada, New Zealand and the United States young adults with VET qualifications are slightly more proficient in literacy than their general education counterparts. In these countries, fully fledged VET programmes mostly exist at the postsecondary level, implying that these graduates have been through more years of education and therefore had more exposure to general subjects than VET graduates in most other countries. Data from the Programme for International Student Assessment (PISA) (as shown in Chapter 3) also show that 15-year-olds in pre-vocational or vocational programmes have weaker reading performance than those in general programmes.

Figure 4.1. Literacy proficiency of VET graduates vs. graduates from general programmes (PIAAC)

Literacy proficiency of young adults (aged 16 to 34 not in formal education)



Note: Belgium refers to Flanders only, the United Kingdom to England and Northern Ireland. The sample includes graduates aged 16 to 34 who are not enrolled in formal education. OECD is an unweighted average of the countries shown.
Source: OECD (2020[1]), *OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis*, https://doi.org/10.1787/1686c758-en.

As such, the PIAAC data suggest that VET graduates may have weaker transversal skills than those coming from other parts of the education system. This could be due to transversal skills getting limited attention in VET curricula, but also because of gaps in these skills when learners enter VET. The gap could also be partially explained by young adults having more limited opportunities to develop these skills after having left the education system and entered the labour market. All of these potential reasons call for increased attention to transversal skills development, at various stages of the life cycle.

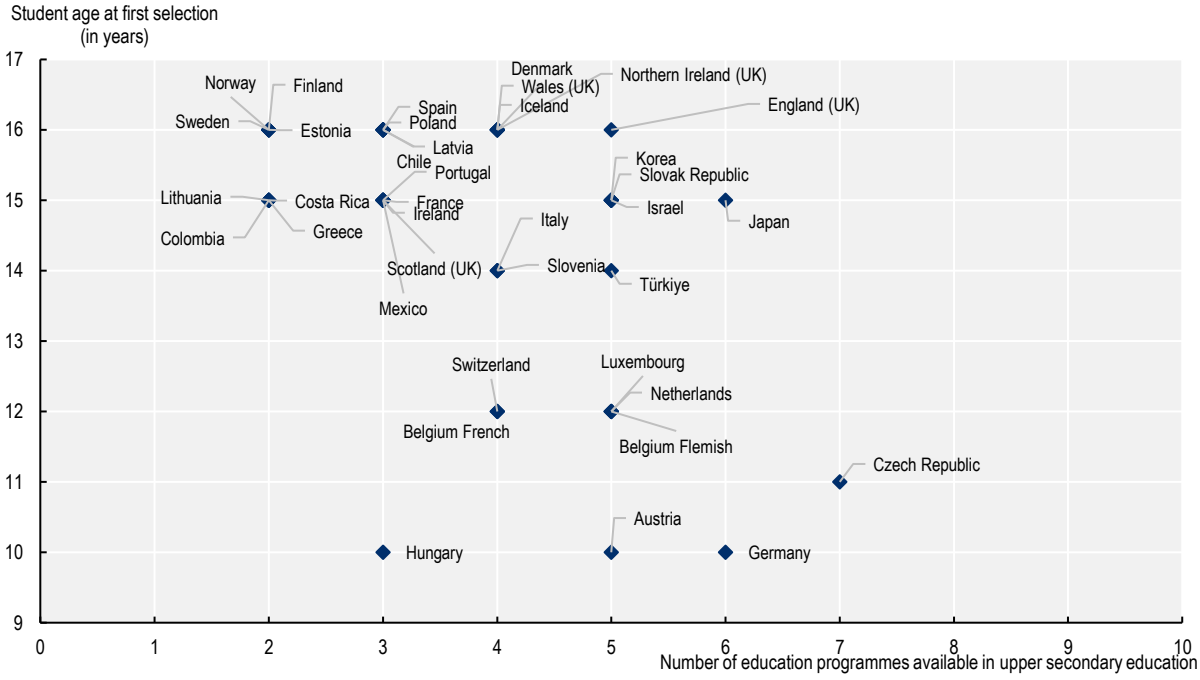
Designing upper secondary VET programmes that allow learners to succeed and be adaptable

Upper secondary education is the last time the full student cohort is in a highly structured school setting where policy makers have considerable responsibility for the curriculum (Stronati, 2023[2]).[1] At this stage, countries have a duty to ensure that, by the time they leave school, all young people have been supported to develop the competencies they will need to succeed in the adult world and working life. At the same time, upper secondary systems need to be responsive to students' interests and abilities, to keep young people engaged and enable them to succeed in their final stage of schooling. To meet these objectives, countries need to provide some degree of specialisation and choice in upper secondary education.

Stratification or diversity across programmes entails students being separated into one, two or multiple different upper secondary programmes, usually classified by orientation (general or vocational). Most countries that distinguish between general and vocational education offer multiple upper secondary programmes. The most frequent number of programmes across OECD countries is three, and the most common combination is one general programme and two vocational programmes. In countries where vocational education is well-developed, as in Austria, the Netherlands and Switzerland, upper secondary education offers more than one vocational programme. These systems have a high level of stratification or diversity across programmes. Countries with a comprehensive system, such as Canada and the United States, have a low level of stratification across programmes, since they do not sort students into different programmes. Even in these countries, students are able to choose vocational options within their comprehensive upper secondary education.

OECD countries most frequently start selection at the beginning of upper secondary education, with the most frequent age of selection being 15. Selection into different pathways might occur very early, as in Austria and Germany (at around age 10), or, as is most common, not until the end of lower secondary education, as in Finland and Norway (at around age 15 or 16). In other countries, such as New Zealand and the United States, there is no formal differentiation between programmes at the upper secondary level, although students in these countries may pursue different levels, options and specialisations within programmes. There is a correlation between when selection occurs and the number of programmes in upper secondary education (Figure 4.2). In most countries offering a higher number of upper secondary programmes, the age at first selection is lower, as in Austria, Italy and the Netherlands. On the other hand, countries with little or no difference between programmes select students at a later age or not at all, as in Chile, England (United Kingdom), Finland, Norway, Sweden and the United States.

Figure 4.2. Education programmes available to students in upper secondary education and age at first selection



Source: Stronati (2023[2]), The design of upper secondary education across OECD countries: Managing choice, coherence and specialisation, https://doi.org/10.1787/158101f0-en - based on OECD (2022[3]), *Education at a Glance 2022: OECD Indicators*, https://doi.org/10.1787/3197152b-en; OECD-INES data collection on ISCED programmes.

Finding a suitable balance between general and vocational content

Irrespective of the number of programmes and the age of selection, all learners in upper-secondary education need to be able to develop the foundational skills required in labour markets and societies. As such, curricula of upper secondary programmes typically contain some compulsory or core content. The core represents those subjects or competencies that are compulsory for all students at the upper secondary level. Countries can define the core by using compulsory subjects that all students must take or by embedding competencies in the curriculum across different disciplines. The core aims to ensure that all students complete upper secondary with a specific and coherent set of skills and competences. In nearly all countries, all upper secondary students are required to study the mother-tongue language and mathematics. Some upper secondary systems provide core content at different levels. In Sweden, for example, all upper secondary programmes require a set of core subjects, such as English, history, physical education and health, mathematics, science, knowledge of religion, civics and Swedish, and students can choose courses at different levels, each of which deepens and advances a particular subject. Providing subjects at different levels enables systems to cater to different learning levels and reflect different aspirations for the future.

While a small number of countries define a small core curriculum or requirements based on minimum competences in literacy and numeracy, as in Ireland, New Zealand and the United Kingdom, the majority of countries have established a wider set of core subjects or content that students need to cover at the upper secondary level (see Table 4.1 for some examples). A wider core tends to limit choice and ensure that students study a broad range of subjects. In contrast, in countries where students study fewer subjects, they tend to go into greater depth.

In countries where students are tracked into general and vocational programmes, core subjects may be the same across the programmes or they may differ substantially. In France, Italy, Japan, Korea, Mexico and Sweden, the core curriculum covers the same subjects for students studying in general and vocational education. A common practice for countries in this group is to offer general and vocational programmes with the same common core and then add a group of compulsory subjects according to the specialisation of each programme (Le Métais, 2002[4]). The additional group of subjects varies depending on the orientation. In vocational education, it often includes professional subjects such as mechanics, health, tourism and technology, depending on the area of specialisation. In Sweden, for example, 30% of the content across vocational and general programmes is the same, which corresponds to the core or compulsory content across both programmes. Providing this degree of shared content across the programmes increases permeability between pathways since students share the same subjects, and it ensures that all students complete upper secondary with the same base of skills and competencies (EURYDICE, 2022[5]).

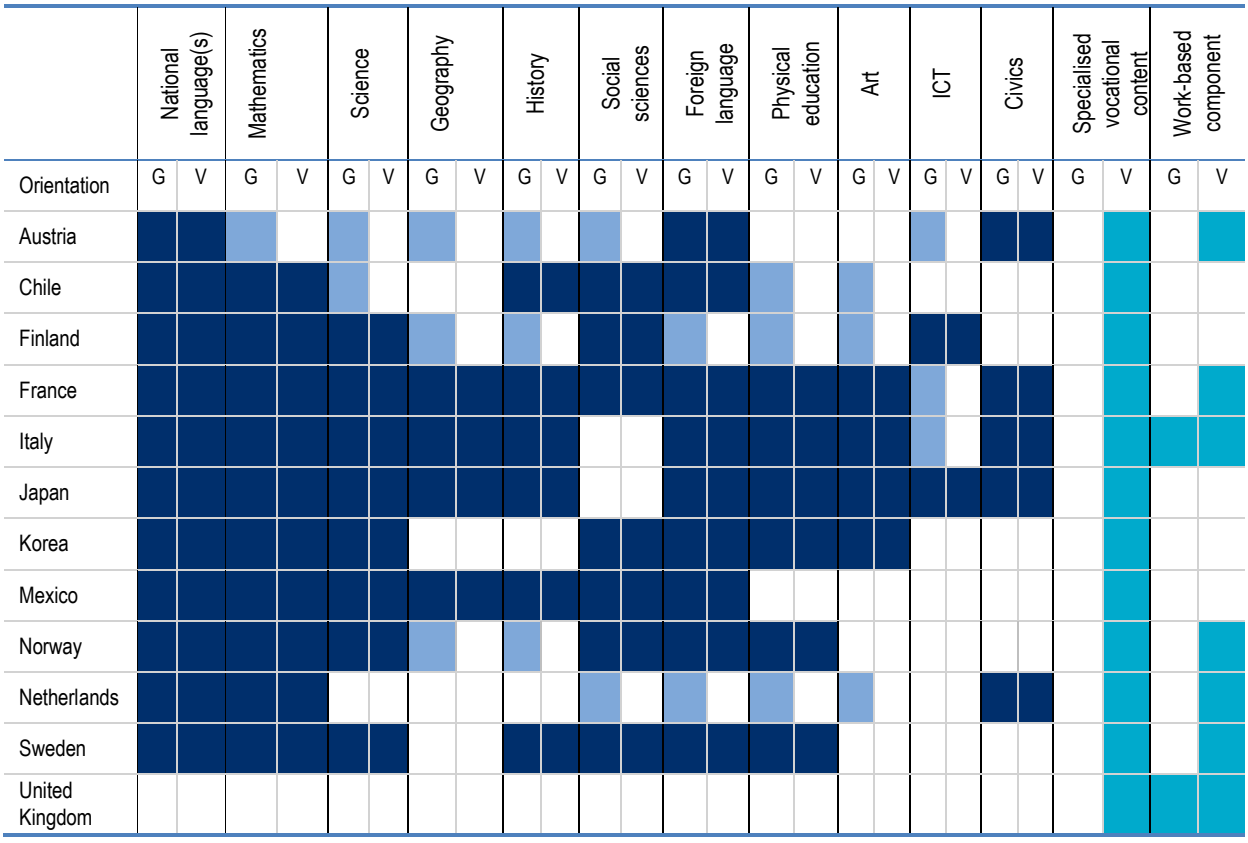
In countries like in Austria, Chile, Finland and the Netherlands the core subjects in the general orientation are different from those in the vocational orientation. In Chile and Norway, there are only two or three differences between the two orientations. In Australia and the Netherlands, the distinction is more significant, with four to six academic subjects in general programmes and three academic subjects plus specific professional content in vocational programmes. In some countries, even if the core subjects across orientations are the same, the time spent on these subjects and the content differ. In Italy, for example, English is a core subject in both orientations, but in general programmes it includes learning the language, the culture and the literature while in vocational programmes it entails learning the language and the vocabulary associated with the specialisation of the programme (MIUR, 2018[6]). In the Netherlands, students in the general track learn Dutch language and literature, while those in the vocational track focus on literacy skills. In the general track, students are exposed to social studies, while in the vocational track the focus is on citizenship and career management skills (EURYDICE, 2022[5]). Adapting content to each specific programme might help vocational students to build more real-world skills and increase engagement and participation as students can see the value of learning. The main challenge is to ensure that all upper secondary students still have strong foundation skills.

Based on evidence from Swedish and Danish VET graduates, it has been shown that the amount of cognitively challenging subjects at the upper-secondary level gives a lasting imprint on literacy proficiency later in life (Rasmusson et al., 2019[7]). Stronger cognitive skills could help adults in the labour market, by making them more adaptable and facilitating participation in further training opportunities. Hanushek et al. (2017[8]) indeed suggest that the weaker labour market outcomes of VET graduates later in life could be linked to weaker basic skills and therefore limited adaptability. Nonetheless, other research on the reforms of Swedish VET programmes finds no evidence that having attended a longer and more general vocational programme is associated with a reduced risk of experiencing unemployment, nor with a higher probability of entering higher education or higher earnings later in life (Hall, 2012[9]; 2016[10]). The evidence also suggests that these longer VET programmes could have a negative effect on outcomes of students who enter these programmes with low levels of skills, as it increased their probability of dropping out of school (Hall, 2012[9]).

Finding the right balance between general and vocational subjects is not an easy task. Firstly, when reinforcing the general component in VET curricula it should be ensured that this does not have detrimental effects on the motivation of students. Some students might have chosen the vocational track because of negative experiences within a standard school-based setting, and might therefore be demotivated by curricula that have a substantial school-based academic component. One way to potentially overcome this issue is to integrate foundational or core skills with vocational training. In the United States, the Math-in-CTE (career and technical education) programme brings together CTE and maths teachers to develop a curriculum map that identifies the CTE concepts and intersecting math concepts that are naturally embedded within the CTE curriculum (OECD, 2010[11]). Secondly, when adding general subjects to VET

curricula results in a longer study duration, the potential benefits of such a reform should be carefully weighed against the expected (opportunity) costs. Ensuring that VET graduates have strong foundational skills is not the sole responsibility of the VET system, but also of the broader initial education system. Strong foundational skills need to be developed already in the early years of education, before students enter the VET stream. This will help avoid that those who enter VET have already accumulated substantial gaps in foundational skills during their early education years.

Table 4.1. Common core in general (G) and vocational (V) programmes in upper secondary education



Note: Information for Korea refers to subjects that are compulsory only in the first year of upper secondary education.
Core in both general and vocational
Core only in general
Core only in vocational
Source: Stronati (2023[2]), "The design of upper secondary education across OECD countries: Managing choice, coherence and specialisation", *OECD Education Working Papers*, No. 288, https://doi.org/10.1787/158101f0-en.

Ensuring that specialisation does not limit adaptability

In most countries, students start to specialise at the beginning of upper secondary education and progressively develop their specialisation as they move through the cycle. A number of countries provide students with space to try out different subjects at the beginning of upper secondary before specialisation begins, so that they can see what they like. In France, all students have an orientation year (called second), which marks the start of upper secondary education. This year helps students to make the choice between programmes and delays the age of specialisation so that it corresponds with the end of compulsory schooling at age 16. In Italy, the first two years of upper secondary education (age 14-16), general and vocational programmes also have a very similar general core. This provides flexibility if students want to

move across programmes and also means that students choose their specialisation at age 16, which corresponds to the end of compulsory education. In the United Kingdom systems, where the upper secondary cycle is comparatively long, students have a first phase at age 14-16, when they study a broad range of subjects (9-11), culminating in national examinations, the GCSEs. This is followed by a second phase at age 16-18, when students study a far smaller range of subjects, culminating in another set of national examinations, the A-Levels or T-Levels. As students move through upper secondary education, the range of subjects that they study often falls, in line with increasing specialisation. In Denmark, for example, the main vocational programme (EUD or *erhvervsuddannelse*) starts with a basic course, in which students choose one of four specialisations in the second year: i) food, agriculture and hospitality; ii) technology, construction and transportation; iii) administration, commerce and business service; and iv) care, health and pedagogy. After completing the basic course, they move on to the main course in which they can choose among around 100 fields.

Internationally, all vocational systems provide students with a specialisation as well as a choice over their specialisation. In vocational systems, specialisations enable students to acquire specific professional or technical skills, which provide the foundations for employment or further study. In countries with multiple vocational programmes and highly developed vocational systems (such as Austria, Germany and the Netherlands), specialisations can be more tailored to specific professions or categories of professions. In systems with fewer vocational programmes, specialisations tend to be broader and less specific, since they need to prepare students to enter both employment and further education.

Countries differ strongly in the number of specialisations they provide in VET – reflecting different choices in how narrow or specialised the training should be and differences in labour market demand. In Sweden, for example, upper secondary vocational education offers only 12 possible vocational qualifications and around 4-5 specialisms per qualification (Skolverket, 2023[12]). In Switzerland, upper-secondary VET students can choose from 245 occupations. For post-secondary VET, there are about 420 federal examinations (260 federal professional examinations, and 160 advanced federal professional examinations), as well as 55 study programmes in vocational education institutions. In Estonia, there are 500-600 vocational qualifications at all levels. This is still relatively low compared to around 1 200 vocational qualifications (including some at higher level) in Australia. While differences between countries reflect the coverage of VET in terms of sectors and occupations, they also reflect differences in how narrowly defined vocational programmes and qualifications are.

A very large number of qualifications may mean that qualifications are defined narrowly to match the needs of a handful of employers, limiting labour market mobility of the qualification holder. Overlapping qualifications undermine the clear signalling of which qualification is appropriate for particular jobs. Very broad qualifications, while providing a range of general and transferable skills, may not make the person immediately employable. For example, in Sweden, where the course requirements are broad, an additional qualification is often required once initial vocational training is completed – for example a trade certificate as a carpenter or plumber (Boverket, 2023[13]).

Various countries have been broadening their vocational programmes and qualifications (and hence reducing the number of specialisations) in response to rapidly changing labour markets. Broader programmes can make learners more adaptable in a changing labour market and allow for more flexibility. Finland's recent reform of upper secondary VET, for example, reduced the number of qualifications from 351 to 164 (of which 42 are initial vocational qualification, and the others are further and specialist vocational qualifications). The initial vocational qualifications consist of vocational units and common units, with the former being either compulsory or optional. In the Republic of Türkiye (hereafter 'Türkiye'), recent reforms aim to reduce the number of VET fields from 55 to 47 and the number of branches from 203 to 109, in an effort to increase flexibility and occupational mobility (Canbal et al., 2020[14]). As of July 2023, there are 53 fields and 114 branches in secondary vocational education institutions, while Vocational Training Centers have 38 fields and 192 branches.

Equipping VET learners with transversal skills crucial for working life and beyond

As labour markets and societies change, transversal skills become increasingly important to navigate these changes and remain adaptable and flexible. Moreover, many transversal skills, such as collaboration, problem-solving and creativity, are hard to automate and therefore become crucial complements to more technical skills in labour markets that are increasingly automated. Indeed, Lassébie and Quintini (2022[15]) find that, thanks to important advances in automation technologies driven by artificial intelligence (AI), some skills and abilities previously identified as bottlenecks to automation, such knowledge of fine arts, several psychomotor abilities, reading comprehension, deductive and inductive reasoning skills, fluency of ideas and scheduling skills, are now more susceptible to automation. However, they also find that significant bottlenecks to automation remain, in particular for skills related to complex problem-solving, high-level management and social interaction – which can hardly be automated given the current state of technological developments.

Transversal skills are defined and labelled in various ways. They typically refer to skills that cut across disciplines or occupations. Various countries have developed dedicated frameworks for such skills, as is the case for "employability skills" in the United States and "meta-skills" in Scotland (United Kingdom) (Box 4.1). Some countries have sought to systematically integrate transversal skills of all types into their qualifications, often by identifying a set of 'key competences' which many or most vocational programmes (and general education) programmes are expected to develop (Field, 2023[16]).

For example, in Australia, training packages include not only occupation-specific skills, but also the foundation skills that support participation in the workplace, in the community and in education and training. Foundation skills include: reading, writing, oral communication, numeracy, learning skills, problem-solving skills, initiative and enterprise, teamwork, planning and organising skills, self-management, and technology skills (Australian Government. Department of Education, Skills and Employment, 2022[17]). Accredited courses must identify foundation skills relevant to the course outcomes and each unit of competency requires the inclusion of information relating to the foundation skills within the unit. Unlike some other countries, Australian training packages do not define required course work (e.g. number of hours in mathematics, English) but the foundation skills are described in terms of the ability to perform a job task. For example, the training package for Certificate II (ISCED level 2) requires students to be able to 'Read and interpret routine information on written job instructions and standard operating procedures', and 'Use basic numeracy skills for undertaking comparison measurements' (Australian Government, 2013[18]).[2]

In Denmark, the regulations for all vocational programmes emphasis the importance of transversal skills (Ministry of Children and Education. Denmark, 2021[19]): "The programme must contribute to the development of the pupil's and apprentice's character formation, professional pride and ability to take independent positions, cooperate and communicate. Training shall also promote professional and social problem-solving skills, the development of initiative, flexibility and a sense of quality, and the development of the basic skills of learners and apprentices, in particular in mathematics, reading, oral and written communication and information technology.". Furthermore, regulations for each programme define how transversal skills are applied in the workplace. For example, "the apprentice should be able to manage day-to-day operations, facilitate good cooperation on the basis of knowledge of ethnic and cultural differences and communicate effectively with employees, customers and other business partners".

Developing transversal skill among learners often requires different approaches than when developing occupation-specific or technical skills. Chapter 5 zooms in on pedagogical approaches that can be considered more suitable for the development of certain transversal skills and the technologies that can support this type of teaching and learning. Some countries make dedicated resources available for teachers and schools. For example, the United States Department for Education developed tools, media and resources related to its Employability Skills Framework (Box 4.1) to support educators, administrators and employers in making use of the framework. Resources include sample interview questions aligned to the Employability Skills Framework for use by employers and educators to help job candidates describe

their employability skills in an employment interview; an instruction planning tool for reflecting on the extent to which employability skills are currently integrated into education and training programmes and identifying opportunities to further emphasise skills where there are gaps; and an assessment selection tool that describes criteria for selecting an employability skills assessment and provides a worksheet for comparing assessment resources to selection criteria. The Scottish meta-skills framework (Box 4.1) is accompanied by a toolkit -developed through consultation with educators and other partners- to create a suite of resources that support practitioners embed skills in a manageable and sustainable way. It includes, among other things, a progression framework with examples of how meta-skills can be developed through different levels of education; professional learning resources to support practitioners with understanding and implementing; lesson plans; and lesson inserts, i.e. bite-size activities and videos that can be used by practitioners to develop and contextualise meta-skills.

Box 4.1. Frameworks for transversal skills

United States: Employability skills framework

As defining, measuring, and building personal and interpersonal skills— even naming them— can be challenging, the US Department of Education compiled the Employability Skills Framework - in an effort to leverage and connect the efforts of policy makers, educators, and employers (U.S. Department of Education, n.d.[20]). The Framework advances a unifying set of skills that cuts across the workforce development and education sectors based on an inventory of existing employability skills standards and assessments. It was developed as part of the Support for States Employability Standards in Career and Technical Education (CTE) and Adult Education project, an initiative of the Office of Career, Technical, and Adult Education. Framework development was guided by CTE, adult education, workforce development and business organisations, and twelve federal agencies. The Employability Skills Framework contains the following elements:

- Applied knowledge
  - Applied academic skills: reading skills, writing skills, math strategies/procedures, scientific principles/procedures
  - Critical thinking skills: thinks creatively, thinks critically, makes sound decisions, solves problems, reasons, plans/organises.
- Effective relationships:
  - Interpersonal skills: understands teamwork and works with others, responds to customer needs, exercises leadership, negotiates to resolve conflict, respects individual differences
  - Personal qualities: demonstrates responsibility and self-discipline, adapts and shows flexibility, works independently, demonstrates a willingness to learn, demonstrates integrity, demonstrates professionalism, takes initiative, displays a positive attitude and sense of self-worth, takes responsibility for professional growth.
- Workplace skills
  - Resource management: manages time, money, resources and personnel
  - Information use: locates, organises, uses, analyses, communicates
  - Communication skills: communicates verbally, listens actively, comprehends written material, conveys information in writing, observes carefully
  - Systems thinking: understands and uses systems, monitors systems, improves systems
  - Technology use: understands and uses technology.

Scotland: Meta-skills framework

Skills Development Scotland defines meta-skills are innate, timeless, higher-order skills that create adaptive learners; able to succeed whatever the future brings (Skills Development Scotland, 2021[21]). The Skills 4.0 model proposes 12 meta-skills organised under three themes:

- Self-Management - Manage the now: Coping with on-going change to support wellbeing, growth, performance and productivity. Includes focusing, integrity, adapting, initiative.
- Social Intelligence - Connect with the world: Connecting and collaborating with others to effectively navigate and negotiate complex social relationships and environments. Includes Communicating, feeling, collaborating, leading.
- Innovation - Create our own change: Defining and creating significant positive change. Includes curiosity, sense-making, creativity, critical thinking.

Building a lifelong learning mindset

The need for workers to reskill and upskill throughout life – particularly in a context of rapid digital transformations – has put lifelong learning at the forefront of the political agenda in most industrialised countries. As discussed in Chapter 3, adults participate relatively little in upskilling and reskilling opportunities, and those with vocational qualifications are among the groups with the lowest participation rates. Adults typically face various barriers to engage in training, and governments can tackle some obstacles – such as time or financial constraints – using short term measures. However, only adopting a lifelong perspective can enable them to overcome other obstacles related to the disposition to learn and a lack of foundation skills originating from previous stages of an individual's education.

Becoming an effective lifelong learner involves a cumulative process, which starts in infancy and is influenced thereafter by the institutional arrangements that provide opportunities to learn (OECD, 2019[22]). Learning at any stage of the life cycle builds on learning and skills acquired at previous stages (Cunha et al., 2006[23]). Hence, setting strong foundations early in life is essential to cultivate lifetime learning. As discussed above, not all VET programmes have an equally important focus on foundational skills. While developing strong cognitive skills – such as literacy or numeracy – is important, previous work by the OECD has shown that non-cognitive skills, as well as strong attitudes and dispositions to learn, constitute the necessary foundations for future learning (OECD, 2019[22]). Some emotional skills and personality traits, such as conscientiousness and openness, can create a favourable disposition to learn later in life. Likewise, some attitudes, such as self-efficacy and intrinsic motivation, help individuals set goals for their learning endeavours.

While individual attitudes and dispositions to learn mostly develop early in life – starting with kindergarten and evolving throughout the schooling years – their benefits carry over into adulthood. In fact, individuals who have positive learning attitudes are more prone to engage in further learning throughout life (OECD, 2019[24]; Tuckett and Field, 2016[25]). Early education and compulsory schooling are therefore critical stages, where all students are given the chance to develop strong lifelong learning attitudes (LLLAs) and close monitoring of individual progress ensures that any arising gaps are rapidly identified and closed through timely interventions.

Using data from PISA, OECD (2021[26]) shows that 15-year-old pupils who are endowed with stronger attitudes and dispositions to learn tend to perform better at school. They also develop higher educational and career expectations than their peers with weaker attitudes. This, in turn, could exert a positive influence on their choice to enrol in further education, and on their labour-market outcomes later in life.

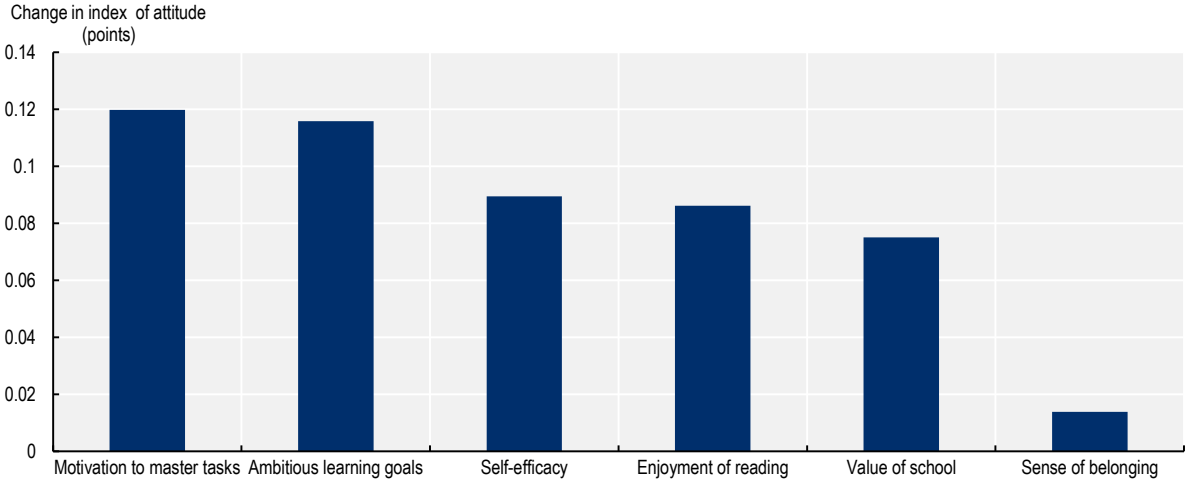
OECD (2021[26]) analysis highlights the existence of a strong link between stocks of attitudes that are accumulated at different stages of the education process. Hence, a greater endowment of lifelong learning

attitudes in adolescence probably results from both contemporaneous efforts and interventions by teachers and families, and prior investments. Therefore, education policy makers should design comprehensive strategies targeting different stages of the learning process (starting with early education) to promote positive lifelong learning attitudes throughout schooling – including in VET.

Together with parents, teachers play a key role in furthering children's and adolescents' cognitive and non-cognitive abilities. Motivating students to become active learners has become a major concern of educators and teachers. OECD (2021[26]) analysis shows that 15-year-olds' lifelong learning attitudes are positively associated with specific teaching styles, especially teacher enthusiasm and teacher stimulation of reading. For instance, teacher enthusiasm has a particularly strong relationship with students' motivation to master tasks and develop ambitious learning goals, as well as their self-efficacy and enjoyment of reading (Figure 4.3). Consistently across countries, the results suggest that students display higher levels of lifelong learning attitudes when they perceive their teachers as inspiring and enthusiastic about the material presented in class. Chapter 2 already highlighted the importance of equipping VET teachers with a solid set of pedagogical and industry-specific skills and knowledge and the need for teachers coming from industry to develop the capability to effectively transfer their skills and knowledge to learners. Chapter 5 includes a discussion of innovative pedagogical approach in VET.

Figure 4.3. Change in lifelong learning attitudes associated with students reporting their teacher is inspiring, OECD average

Changes in the index of each LLLA associated with a change in the dummy variable of whether the 15-year-old student perceived the teacher as inspiring



Note: Regressions are estimated separately for each lifelong learning attitude (LLLA), taking into account the student's and school's socio-economic status, age, gender, reading performance, parental support, other teaching practices and disciplinary climate.
Source: OECD (2019[27]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, https://doi.org/10.1787/47dcfb0d-en.

What do effective progression opportunities for VET graduates in higher education look like?

In the past, vocational upper secondary programmes were often designed to provide a route to a skilled job, perhaps a lifetime occupation. Today VET is often an intermediary qualification, on which individuals will build as their career develops. Many bright and ambitious students in vocational programmes will have their eyes set on tertiary studies to complete before entering the labour market. Others will start their careers and seek to pursue higher level programmes to progress in their sector or change careers.

Evidence shows that jobs held by VET graduates are more at risk of automation than those held by tertiary graduates (Vandeweyer and Verhagen, 2020[28]; OECD, 2020[1]). In the context of fast-changing skills needs and automation, VET graduates increasingly need to be prepared to pursue further learning, including at higher levels of education. This section therefore looks at progression pathways between initial VET and tertiary education.

Establishing pathways from VET to higher levels

Countries have adopted various approaches to building pathways from upper-secondary VET to higher levels of learning. Most OECD countries offer vocational programmes as one of the pathways in upper secondary education (as discussed above), with different opportunities for progression to higher levels. Many countries have a single vocational track at upper secondary level and all VET graduates have direct access to all levels of tertiary education, similarly to their peers from general upper secondary programmes. Examples include Chile, Costa Rica, Estonia, Finland, Korea, Lithuania, Portugal and Türkiye. In practice, this often means eligibility to those programmes, and there are often additional selection procedures. Access to bachelor level programmes is sometimes restricted to a specific sector of tertiary education, often part of the "higher VET" sector or a distinct institutional sector with focus on applied, professionally-oriented learning (see Chapter 2): in Germany, the Netherlands, Slovenia and Switzerland VET graduates can access professional programmes but not universities. In some countries VET graduates can access short-cycle tertiary education, which is mostly professional in nature. These programmes develop higher level occupational skills and can also serve as a bridge to bachelor's level. For example, in Austria VET graduates have direct access to short-cycle tertiary programmes only (which are in effect a continuation of upper secondary VET). Upon completion, graduates gain eligibility to universities and universities of applied sciences. Similarly, in Chile graduates of higher technician programmes at ISCED level 5 may progress to four-year programmes offered within the same institution. In Denmark, business academy graduates in some programmes have the option to pursue a top-up degree of 1.5 years and obtain a professional bachelor's degree. In the United Kingdom Higher National Diploma graduates may enter the third year of a bachelor's degree programme (OECD, 2022[29]). But not all short-cycle tertiary programmes open the doors of bachelor's level education. Some higher vocational programmes are rather disconnected from the university sector in particular, so that completing them does not facilitate entry into bachelor's programmes.

Many countries have at least some VET programmes that do not yield direct access to tertiary education. In countries where a large share of students pursue such programmes (e.g. France, Hungary, Netherlands, Slovenia), there are always bridges that connect VET with tertiary education. Bridges that connect vocational programmes with tertiary education may take different forms (some are described in detail in Box 4.2):

- Dedicated bridging programmes: These mostly take one or two years to complete. Examples of ISCED level 3 bridging programmes include follow-up courses yielding the maturita in the Czech Republic, programmes preparing for the maturity examination in Hungary, or the vocational baccalaureate in Switzerland. In some countries such bridging programmes are offered at postsecondary non-tertiary level – such as programmes yielding the university entrance qualification in Germany, and follow-up courses yielding the maturita in the Slovak Republic.
- Options within upper secondary vocational programmes: Vocational students may choose to pursue additional general education and obtain eligibility to tertiary education (or a wider range of tertiary programmes) – such options exist in Denmark, Germany and Switzerland (the above-mentioned vocational baccalaureate).
- Stand-alone examinations: VET graduates may prepare for the examination on their own or through a preparatory course – examples include the vocational matura in Austria and the vocational baccalaureate in Switzerland.

Some countries offer various bridging options at the same time – for example in Germany the university entrance qualification may be obtained in parallel to the apprenticeship programme or upon completion of it, taken as a stand-alone examination.

Box 4.2. Gaining eligibility to tertiary programmes during or after VET

Denmark

In Denmark, the EUX programme was introduced to increase attractiveness of VET and provide an option for students interested both in vocational training and academic education. These programmes are more demanding than regular vocational programmes as students have to acquire two qualifications in parallel. Unlike, other upper-secondary VET programmes, EUX provides direct access to higher education. This form of education and training has been gaining popularity and now enrols 13% of all VET students (6% of all upper-secondary students). In 2018, among students opting for VET 30% chose EUX programmes. Evaluation has shown that the EUX programme, as intended, has attracted into VET strongly performing students who would not have considered VET in the absence of access to higher education. One potential risk identified by some commentators is that over time EUX might turn into academic programmes with the vocational element being lost (Andersen and Helms, 2019[30]; CEDEFOP, 2018[31]; Jørgensen, 2017[32]).

Norway

In Norway, while the mainstream 2+2 VET model in upper secondary education is composed of two years in school followed by two years in work-based learning, students can opt for other types of VET provision depending on their needs and objectives. For example, students interested in VET and at the same time aiming for entry to higher education can work simultaneously over four years towards vocational and study competence (YSK) and technical general studies (TAF). Students in this programme receive their work-based learning in parallel to education and training in school in general education subjects and subjects common to the chosen programmes (Utdanningsdirektoratet, 2023[33]).

Switzerland

VET graduates are eligible to professional programmes at tertiary levels, but not universities or universities of applied sciences. The federal vocational baccalaureate yields eligibility to universities of applied sciences and may be obtained during apprenticeship or taken as a separate examination. Obtaining it during the apprenticeship requires the apprentice to pursue work-based learning in a company that offers the vocational baccalaureate. Admission is subject to certain conditions (e.g. school grades, entrance tests) and the programme involves about one additional day at the vocational school compared to other apprentices. Alternatively, VET graduates may prepare individually and take a central examination. The examination involves a written test, an oral test and an interdisciplinary project work. The interdisciplinary project work focuses on a pre-defined topic, specific to the sector targeted by the candidate. If VET graduates wish to gain eligibility to university programmes, they need to complete a *Passerelle* programme (SDBB, 2023[34]).

One different approach to organising pathways is to keep upper secondary education general and delay occupational preparation mostly to the postsecondary level, as in Canada and the United States. Vocational courses exist in upper secondary education but they are offered typically as an optional subject and take up limited space in the curriculum. In the absence of vocational tracks, there are no constraints in progression to higher levels (although accessing some fields will require the completion of particular subjects and levels at high school level, such as higher maths for engineering). The pathway from high school to higher levels of education is often similar to progression from general education to tertiary education in countries with vocational tracks. In schools that offer programmes with stronger vocational

content (e.g. CTE concentrators in the United States), there are sometimes linkages with postsecondary education, linking initial technical preparation in high school to a postsecondary qualification in the same field (Box 4.3).

Box 4.3. Creating linkages between vocational content in upper secondary and tertiary programmes

Early college credit – United States

"Dual enrolment" or "early college" programmes allow students to pursue college-level courses and earn credits while still at high school. They are designed to encourage students from disadvantaged backgrounds to earn a postsecondary qualification: tuition is often discounted or free, and students can prepare for the academic and social requirements of college, while still having access to the supports available to high school students. Details of implementation vary – in most cases, qualified high school teachers or visiting college instructors deliver college-level courses in the high school. In other models, students take all or most of their courses on the college campus. Early college initiatives have grown across the United States over the past decades, but remain small (Hoffman et al., 2021[35]).

Rigorous evaluations, including randomised controlled trials, show that these programme are effective in achieving those goals. Dual enrolment programmes improve high school achievement, high school attendance and graduation, as well as college enrolment (What Works Clearinghouse, 2017[36]). A study of longer-term impacts of an early college credit programme found that students who won admission lotteries to the programme were more likely to enrol in college and complete a college degree (associate degree, certificate or bachelor's degree) than those in the control group (Song et al., 2021[37]).

The following guiding principles can underpin strong pathways between upper secondary VET and higher levels of education:

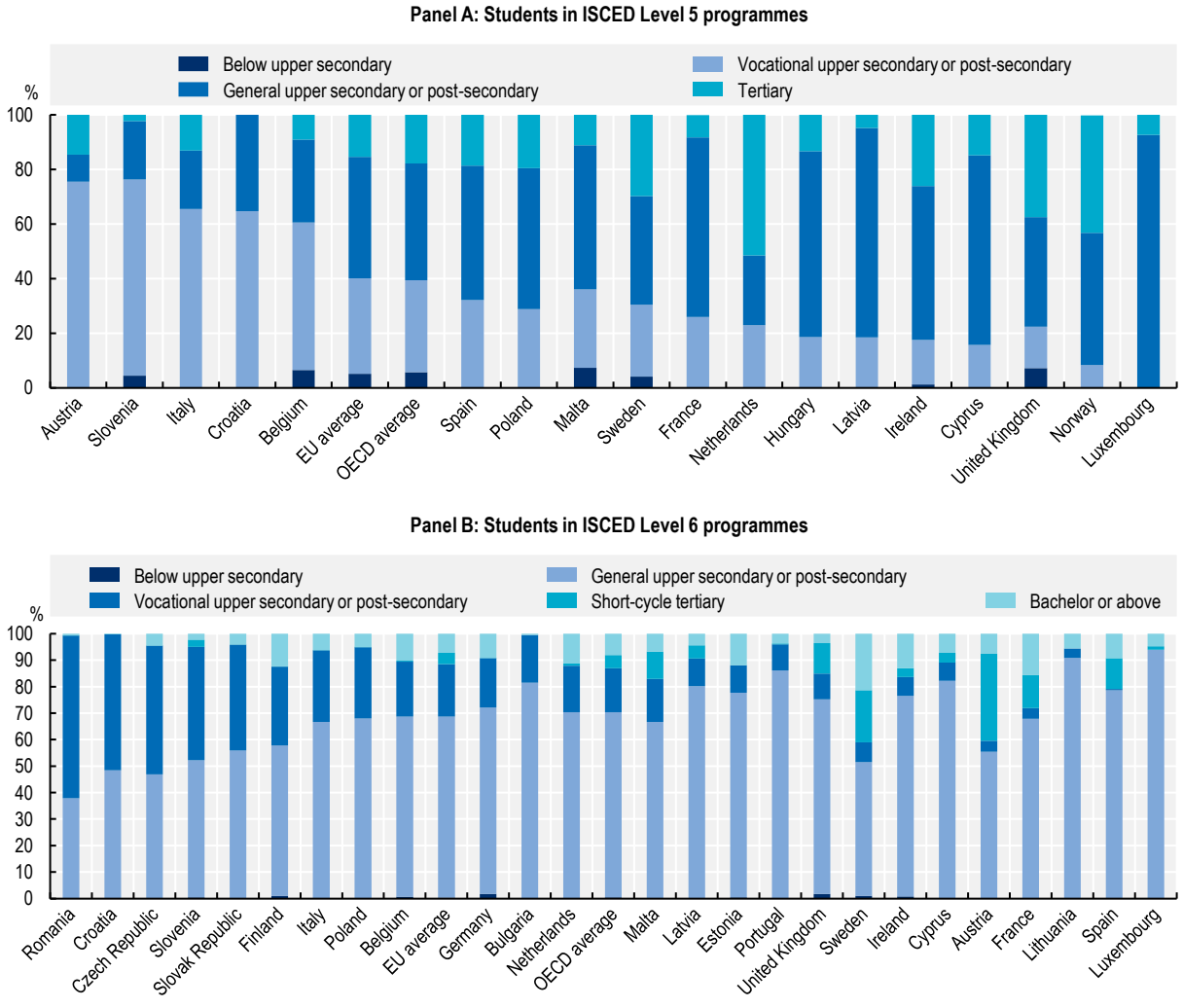
- Nobody should be locked out of higher-level learning opportunities because of a choice they made (or a route they were directed to) at some point in their education. From any vocational programme there should be a potential progression pathway that leads to higher levels.
- Creating effective pathways is important for the attractiveness of vocational programmes. Young students with an interest in a vocational field will include some who are not attracted to academic forms of learning, as well as some who would like to keep their options open or who have their eyes set on tertiary education. Without realistic opportunities to access higher levels of education after VET, those in the latter groups will opt for general education.
- Restrictions on eligibility to higher levels of education are more likely to damage the attractiveness of VET when lower secondary students are free to choose the orientation of their upper secondary programme (e.g. not constrained by school grades or early tracking) and where the educational offer open to VET graduates is limited (e.g. a small sector of higher vocational programmes poorly connected to university programmes).
- Allowing direct access from vocational programmes to higher levels does not necessarily remove all hurdles – sometimes progression is rare and subsequent completion rates are low (see below). Similarly, restrictions on progression opportunities may be combined with a rich offer of tertiary programmes open to VET graduates and strong bridges that yield eligibility to a wide range of tertiary programmes, creating an effective system for career progression for VET graduates.

Supporting take-up and successful completion

It is important to complement the picture of available pathways with data on the take-up of those pathways. In some countries, there is a well-trodden path from VET to postsecondary or tertiary education. In others the route is long and filled with obstacles, so few VET graduates end up taking them successfully. Whether or not VET graduates continue to post-secondary education will also to some extent reflect labour market demand for such higher-level qualifications.

Figure 4.4. Distribution of educational attainment of students in ISCED level 5 and 6 programmes

Share of students (2017- 2019 pooled data)

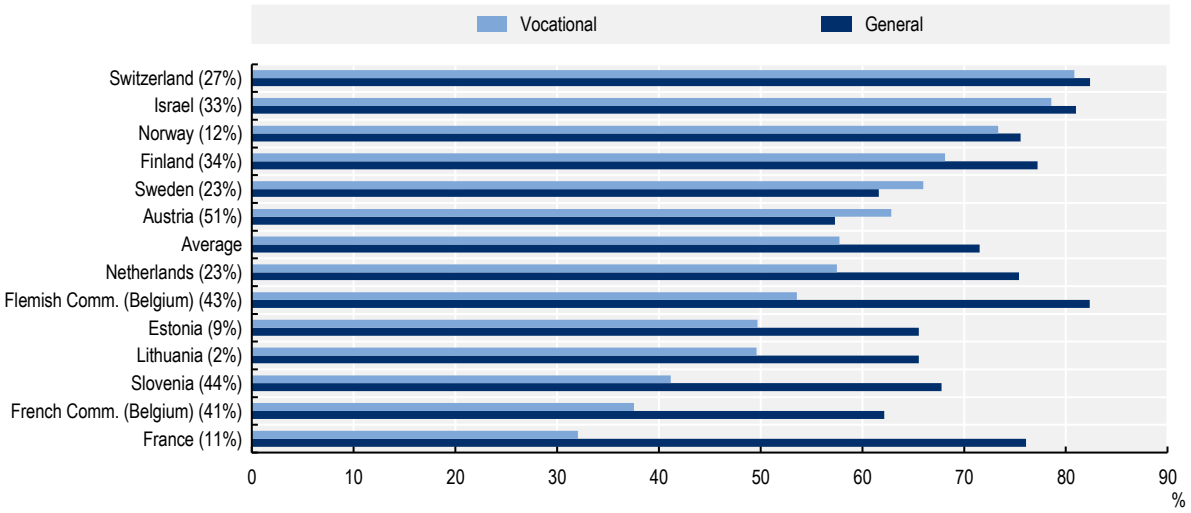


Note: Data include only students aged 34 or less or who obtained their highest qualification up to 15 years prior to the survey. Averages refer to unweighted averages of available countries.

Source: OECD (2022[29]), *Pathways to Professions: Understanding Higher Vocational and Professional Tertiary Education Systems*, https://doi.org/10.1787/a81152f4-en, using the European Union Labour Force Survey (2017, 2018, 2019).

Figure 4.5. Completion rates in bachelor's level programmes (2020)

Completion rates (%) by the end of theoretical duration + 3 years, by orientation of upper secondary qualification



Note: Data are provided for the theoretical duration of the programme plus one semester (not the theoretical duration) in Sweden. In the French Community of Belgium data refer only to the hautes écoles (HE) and the écoles des arts (ESA), representing about 60% of entrants to bachelor's or equivalent programmes. The share of ISCED level 6 entrants with a vocational upper secondary qualification is indicated in brackets. Data are provided for the theoretical duration of the programme plus one semester (not the theoretical duration) in Sweden.
Source: OECD (2022[3]), *Education at a Glance 2022: OECD Indicators*, https://doi.org/10.1787/3197152b-en, Figure B3.4.

Comparative data on progression from VET to higher levels are patchy, but reveal much variation across countries in the share of VET students among tertiary students. In some countries progression to short-cycle tertiary education and bachelor's level programmes is common (Figure 4.4): in Austria and Slovenia for example, VET graduates represent the majority of short-cycle tertiary students (OECD, 2022[29]) and they account for around half of bachelor's level students. In Switzerland the short-cycle tertiary sector is small (less than 5% of new entrants to tertiary education) but bachelor's level programmes commonly serve VET graduates: professional examinations (ISCED levels 6 and 7) and PET colleges (ISCED level 6) require a vocational upper secondary qualification for entry (although exemptions are possible). Even in universities and universities of applied sciences (which require VET graduates to pursue a bridging programme before entering) VET graduates represent nearly a third of new entrants.

Achieving high completion rates in tertiary education in a widespread challenge, especially for students with a vocational upper secondary background. In most countries with available data, completion rates are lower among vocational upper secondary graduates than among those holding a general upper secondary qualification (see Figure 4.5, noting that only full-time students are covered and those having completed a bridging programme may appear as general upper secondary graduates). At the same time, completion rates are high among VET graduates in some countries (e.g. Israel, Switzerland), and in Austria and Sweden they are higher than completion rates among general upper secondary graduates.

How can career guidance support smooth transitions?

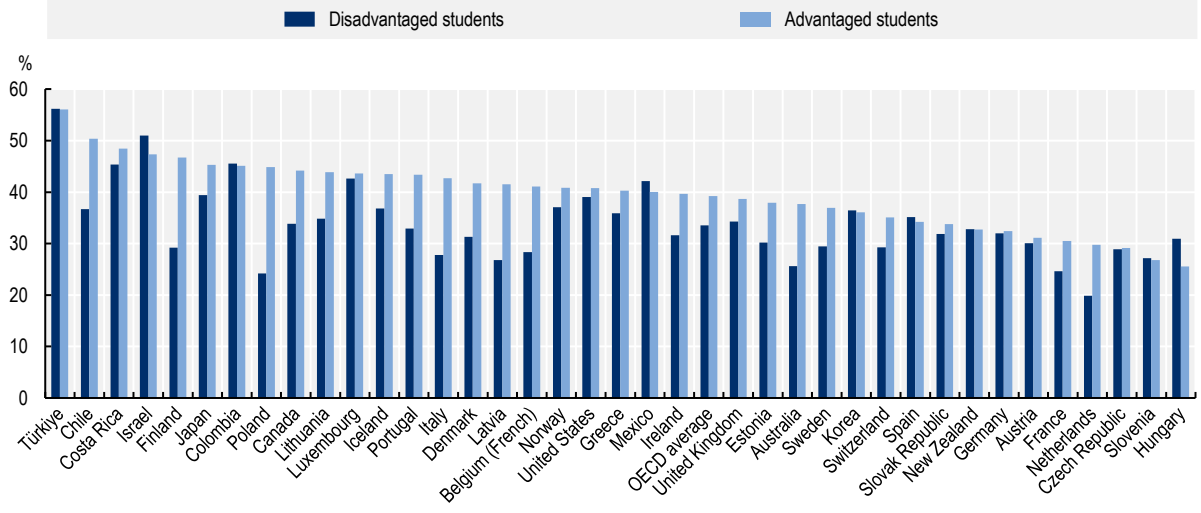
As the world of work and the education and training landscape are changing, career guidance has become increasingly important for prospective and current VET learners. In this chapter, career guidance refers to services intended to assist individuals in making well-informed educational, training and occupational choices, as well as in managing their careers (OECD, 2004[38]; Musset and Mytna Kurekova, 2018[39]).

Career guidance consists of a wide range of activities, such as i) career education activities, in which individuals learn about the world of work and develop career management skills; ii) career information activities, delivering information about courses and occupations, learning and career opportunities, progression routes and choices, as well as information on where to find help and advice, and how to access it; iii) individual career counselling activities, providing specific advice on career decisions; and iv) activities of direct contact with the world of work, to raise and broaden career aspirations (Musset and Mytna Kurekova, 2018[39]). Career guidance has several functions. Firstly, it informs young students and working adults about education, training and employment opportunities, including those in vocational fields. Secondly, career guidance helps individuals to reflect on their strengths and interests. For example, self-assessment tools help individuals explore their interests, current skills and potential for studying different subjects or pursuing different occupations.

Evidence shows that students' career choices are misaligned with labour market trends and needs in many countries, highlighting the need for more and better guidance. For instance, in countries like Canada and the United States, the occupations preferred by 15-year-old students are very different from the fastest-growing occupations in these economies (Mann et al., 2020[40]). Moreover, students only consider a relatively narrow set of job choices: across OECD countries, 36% of students who had a clear idea of what career they expected to have at the age of 30 expect to work in one of the ten most frequently cited occupations by young people in their country/economy. This is the case for 34% of socio-economically disadvantaged and 39% of socio-economically advantaged students (Figure 4.6), and is also more likely for girls than for boys (Mann et al., 2020[40]).[3] Many teenagers ignore or are unaware of emerging jobs. The same data also reveal a narrowing of expectations as these shares increased by eight percentage points for boys and four percentage points for girls since the 2000 PISA survey.

Figure 4.6. Students who expect to work in one of the ten most cited occupations

Share of 15-year-old students who expect to work in one of the ten occupations most frequently cited in the relevant country/economy, by student socio-economic status

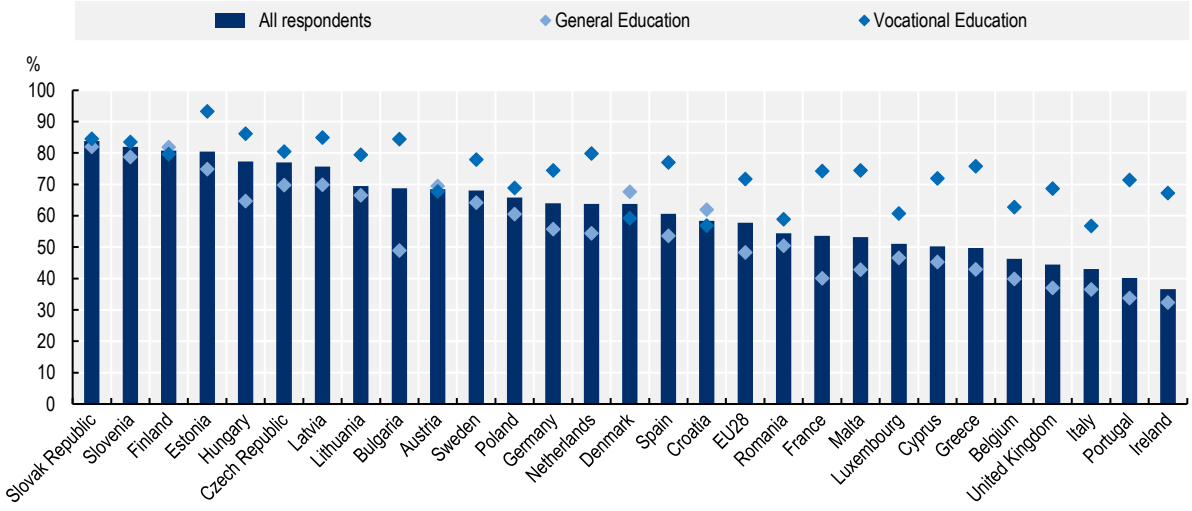


Note: Statistically significant differences are marked in a darker tone (including the OECD average). Disadvantaged students are those in the bottom quarter of the PISA index of economic, social and cultural status, advantaged students are those in the top quarter. Vague and invalid answers (smileys, for instance) are excluded.
Source: Mann et al. (2020[40]), Dream Jobs? Teenagers' Career Aspirations and the Future of Work, www.oecd.org/education/dream-jobs-teenagers-career-aspirations-and-the-future-of-work.htm.

To support students in making informed education and career decisions, it is paramount that countries have robust, efficient and effective career guidance services. Such services should give students a good understanding of the education and training options available, as some options, particularly those in VET, are often poorly understood by students (Musset and Mytna Kurekova, 2018[39]). In an EU survey, only 58% of respondents reported receiving information about VET options when deciding on their education at the upper secondary level (Figure 4.7). Moreover, there is a marked difference between general education and VET orientation: among those whose upper secondary education was primarily vocational, 72% say they receive VET information when deciding; this is true only for 48% of those whose upper secondary education was primarily general. Career guidance should also help students better understand different careers and broaden their aspirations – particularly those occupations linked to VET studies (Musset and Mytna Kurekova, 2018[39]). A lack of understanding about their career options can affect young students' decisions to join VET and their transitions from VET to the world of work or into further learning. Therefore, career guidance is crucial to support VET students' transition from education to work and between secondary and post-secondary studies. Effective career guidance encourages young students to reflect on who they are and want to become and think critically about the relationships between their educational choices and future economic life (Mann et al., 2020[40]). Parents and teachers are fundamental in young people's decisions. Employers can also play an important role in widening the options considered by young people and providing insights into the world of work, especially in VET programmes (Mann, Rehill and Kashfpakdel, 2018[41]).

Figure 4.7. Receiving information about vocational education

Percentage of individuals who received information on vocational education at the moment of deciding on the upper secondary track, by orientation of their upper secondary track



Note: The opinion survey was carried out in 2016.
Source: CEDEFOP (2017[42]), "Cedefop European public opinion survey on vocational education and training", *Cedefop research paper*; No 62 http://dx.doi.org/10.2801/264585.

Career guidance is essential not only for young students but also for adults. New jobs are being created with the green and digital transition, while others are becoming obsolete, and many existing jobs are undergoing changes. This implies that some adults may need upskilling and reskilling and require support and guidance to develop the right skills and increase their employability. Evidence suggests that career guidance on VET can be especially relevant for supporting adults' upskilling and reskilling decisions in a dynamic labour market (CEDEFOP-OECD, 2021[43]). As highlighted in Chapter 3, many adults do not

participate in training nor are interested in doing so. Effective career guidance can contribute to engaging adults in training and overcoming barriers. Career guidance reduces information asymmetries that adults may face, raises awareness of training options -including VET programmes-, enables the validation of skills, and supports job search (OECD, 2021[44]). Adults would benefit from receiving clear and updated information on job and training opportunities, as well as options for assessing the abilities and skills gained through work and previous learning experiences (see Chapter 3). Public employment services and counselling agencies are fundamental in providing career guidance for adults (OECD, 2021[44]) to support them in making informed decisions about their careers and professional development.

Supporting (prospective) VET students in making informed education and career decisions

Characteristics of career guidance for students in initial education

Although career guidance for students usually takes place in schools, career guidance services can be provided in different settings and through different channels (OECD, 2004[38]). Career guidance is provided to young students by both academic and vocational secondary education institutions, private career guidance providers, and post-secondary/tertiary education institutions looking to welcome new students. For instance, Chile's biggest provider of tertiary vocational education (*Instituto Nacional de Capacitación Profesional*, INACAP) offers free in-person advice to students interested in higher-level vocational studies. This service includes tests of interests and skills, and a web tool mapping their test results to INACAP's offer of VET programmes (INACAP, 2021[45]).

In addition to face-to-face guidance activities, interactive online tools provide general information and tailored advice for students based on their skills and interests. Many countries have developed online portals with comprehensive information to make career decisions – often targeting learners of all ages – as a complement to face-to-face activities. Online portals sometimes include online chat systems or advice from specialists via phone or videoconference. For instance, in Scotland (United Kingdom), the portal 'My World of Work' is a platform containing information to support young students and adults in their career choice (Box 4.4). Users can browse vocational and academic courses and their associated occupational profiles in several industries. The website complements face-to-face guidance delivered in schools and dedicated guidance centres in Scotland.

Box 4.4. Comprehensive career guidance services in Scotland (United Kingdom)

Skills Development Scotland (SDS) is the national skills body that delivers Scotland's career service in schools, centres and online. In addition, it has a telephone contact centre to provide career information and advice and talk about employability support.

Career services in schools

SDS's professionally qualified careers staff support pupils, parents and teachers with a comprehensive range of career information, advice and guidance services. For pupils, this includes group activities to support the transition from primary to secondary education, group activities and one-on-one sessions in secondary education regarding subject choice and senior phase option choice, transition support for learners in the last years of secondary education who have not yet secured a post-school opportunity, one-to-one sessions for those who would benefit most from intensive support, and a drop-in service to speak to a school careers advisor. For parents and carers, it includes the possibility to attend subject choice one-to-one discussions with the pupils, as well as dedicated parent and carer engagement activities.

SDS Centres

SDS Centres are open on high streets across Scotland, with many of the career experts also working at local community venues. They support young people and adults develop lifelong career management skills to enable them to explore their career options and decide which route is the right one for them. The centres' services include: i) career information, advice and guidance on career choices; ii) advice on the routes into a career, including jobs, apprenticeships, training and learning; iii) help with CVs, application forms and interviews; iv) careers events; v) insight into the local labour market; vi) access to Scotland's careers web service, *My World of Work;* vii) redundancy support; and viii) support for parents and carers.

Online guidance portals

My World of Work is Scotland's career information and advice website designed to support people of all ages in developing their career management skills. The portal includes advice and tools to help young students and adults learn about their interests, skills, training and work opportunities. It also supports individuals with customised information on possible career pathways that better match their skills, strengths and personality type. The website holds multiple interactive tools covering relevant education, training and career options, including apprenticeships, post-secondary education, and direct transition to work. Additionally, the portal contains information, advice and resources for parents and carers, teachers, and college and university staff to support career guidance. For instance, strategies, lesson plans and guidelines are available for teachers to support the delivery of the career education curriculum in the classroom for young people from different age groups and grades, following the Career Education Standard in Scotland (Skills Development Scotland, 2015[46]). In addition to *My World of Work,* Skills Development Scotland also manages the *Apprenticeships.scot* portal. It provides information about the different types of apprenticeships available, shares experiences of current and past apprentices, and finds current apprenticeship opportunities.

Source: Skills Development Scotland (2022[47]), Scotland's Careers Services, www.skillsdevelopmentscotland.co.uk/what-we-do/scotlands-careers-services/.

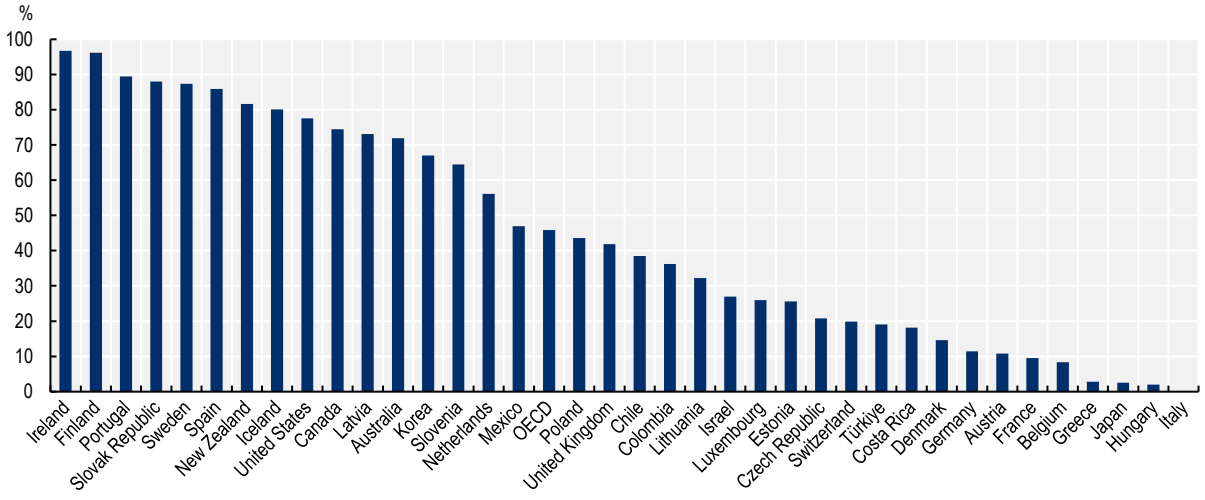
Employers can be one of the best sources of advice and guidance for young people thinking about their future careers, especially for those considering enrolling in VET and for current VET students wanting to enter the labour market. Companies have deep knowledge about specific fields and industries, and can therefore provide valuable information to those interested in VET. By engaging with businesses, schools can give their students real-world work experiences, bring more relevance to their learning, and open their eyes to different career pathways. Employer engagement can facilitate direct contact with those working in different careers and expose young students directly to workplaces (Musset and Mytna Kurekova, 2018[39]). These strategies give young people a clearer idea about what jobs involve and supply trusted information about labour market demand, allowing students to become better prepared to make education and career decisions (Rehill, Kashefpakdel and Mann, 2017[48]). In the United Kingdom, for instance, local business leaders participate in career talks with students. They share insights, career guidance, lessons and tips, and information about their company and its sector to motivate and inspire young students to make informed decisions about their future. Companies can also offer short training programmes (traineeships) to young students for career mentoring and skills development (Education and Skills Funding Agency, 2017[49]). Extensive evidence demonstrates solid links between school-employer engagement and students' learning and employment outcomes. From school-organised career talks with outside speakers to students' enrolment in internships and other work-based learning opportunities, employers' participation in career guidance activities has benefits for students' motivation and attitude toward learning (Mann and Dawkins, 2014[50]), future economic prospects (Kashefpakdel and Percy, 2016[51]) and labour market placement (Mann, Rehill and Kashfpakdel, 2018[41]).

Participation in career guidance by students

Access to career guidance services varies substantially across countries (OECD, 2019[27]). According to PISA data, access to career guidance for 15-year-old students in schools is almost universal in countries like Ireland, Portugal and Sweden, whereas less than 10% of students have access in countries like Belgium, Greece, Hungary, Italy and Japan (Figure 4.8). Access to career guidance services in schools is usually determined by countries' national policies and the school resources available. Also, within countries, there are substantial differences between schools and students in terms of access to career guidance (see next subsection for further details).

Figure 4.8. Students with access to one or more dedicated counsellor(s) providing career guidance in schools

Percentage of 15-year-old students in schools with one or more dedicated career guidance counsellor(s).

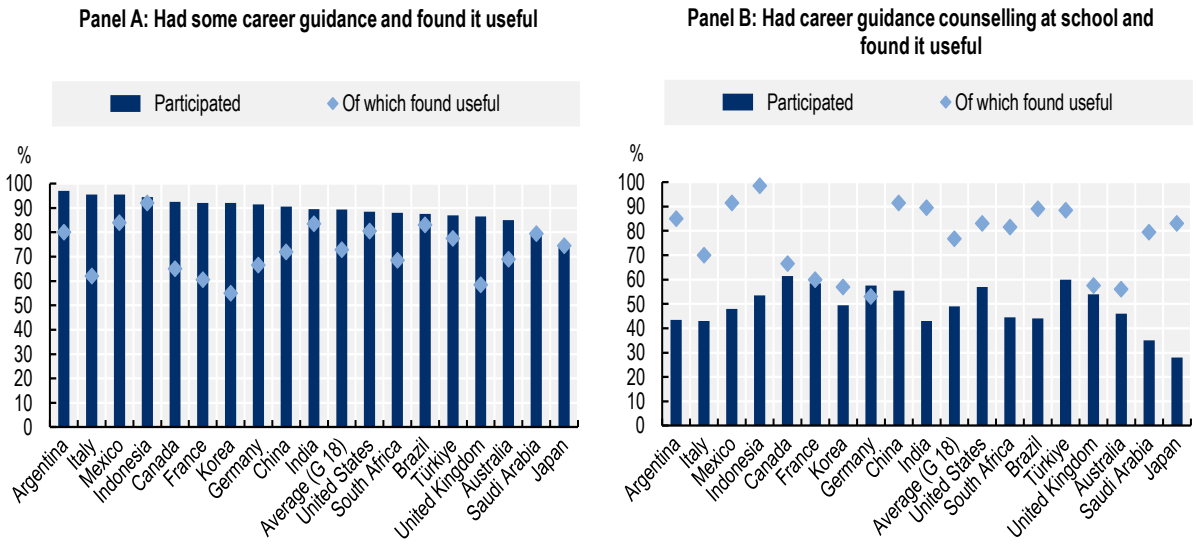


Source: OECD (2019[27]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, https://doi.org/10.1787/47dcfb0d-en.

Career guidance take-up depends on the type of activities offered, the information provided and the bodies in charge of delivering them (e.g. schools, employers). These elements affect the quality of the career guidance services and their perceived usefulness. According to a WorldSkills-OECD survey among young people (aged 18 to 24) at the end of general education and VET programmes in 18 countries, 89% of students had received some form of career guidance, of which 73% found it useful (Figure 4.9). Only 49% benefited from career counselling services provided by schools, although these were most likely to be deemed useful (77%). This is particularly the case for schools that mediate career guidance activities with employers or offer career guidance counselling, including career education on work-related activities (e.g. how to get a job, how to write a CV), which students find significantly useful (Worldskills and OECD, 2019[52]).

Figure 4.9. Participation and usefulness of career guidance activities provided by schools

Percentage of upper secondary school students (2019)



Note: Young people at the end of general education and VET programmes from 18 "G20" countries. The share for each country is computed as an unweighted average between "No fee-paying secondary schools" and "Some fee-paying secondary schools."
Source: WorldSkills and OECD (2019[52]), Youth voice for the future of work, https://worldskills.org/what/projects/youth-voice/.

Strengthening career guidance for students

Better informing students about the value, importance and availability of career guidance resources

Young students are not necessarily aware of the value of the information provided by career guidance services. Students usually trust other sources of information to make these decisions, including advice and information provided by their parents. However, parents usually lack information about the full range of options available. They can be unaware of the diversity of jobs available in the different sectors of the economy, which can affect students' decisions (Musset and Mytna Kurekova, 2018[39]). This is especially the case for students from disadvantaged backgrounds, where families usually have less knowledge about the choices of tertiary programmes available to them. Moreover, parents usually favour general programmes over VET programmes, so this could have significant implications, especially for those students that may be potentially interested in VET-related occupations that are less well known (Musset and Mytna Kurekova, 2018[39]).

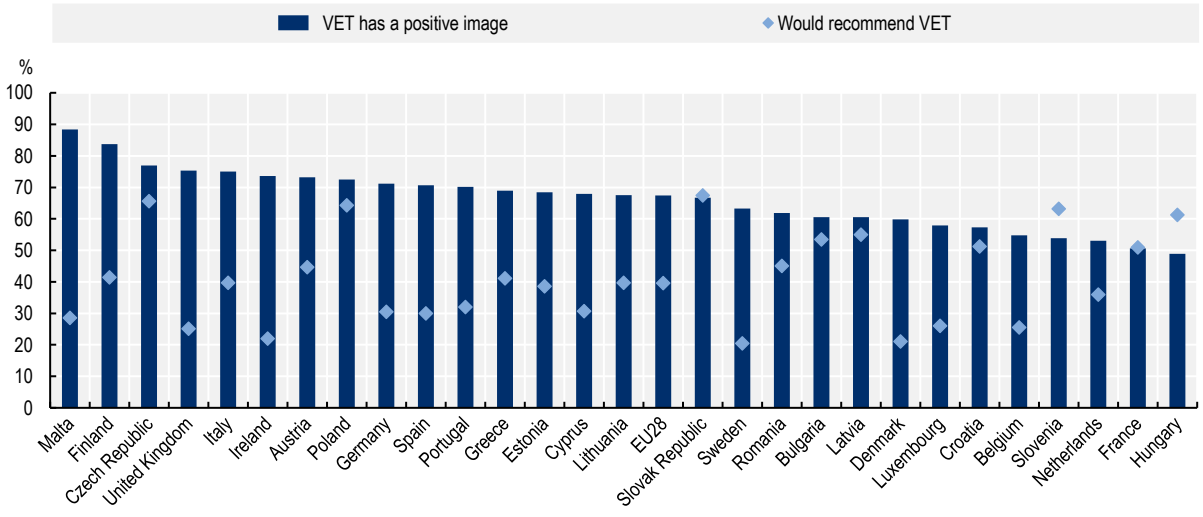
As highlighted in Figure 4.8, not all students have access to career guidance in schools. In those countries where career guidance is not readily available at schools, students may be unaware of the existing sources of information they can use to inform their career decisions. If they are not easily understandable or immediately available, students may not take the time to examine these resources. There are initiatives targeted at young students in several countries to increase their awareness of the importance of making well-informed career decisions. These initiatives include national or regional information campaigns, job fairs, and activities designed to give students an idea about the world of work. Campaigns such as the National Careers Week in the United Kingdom use media resources (including social media) to inform young students about career guidance activities and the importance of career-related decisions.

Tackling students' misconceptions about VET programmes and careers

Many occupations targeted by VET and learning routes, such as apprenticeships, are stereotyped or poorly understood, contributing to skills shortages and the risk of school dropouts (CEDEFOP, 2021[53]). Despite the generally strong labour market outcomes of VET students, only a limited share of people would recommend it as a post-secondary education option (Figure 4.10). One possible reason is the misconception that VET only leads to the labour market and is a dead-end in education progression (see previous subsection for more details about progression pathways). According to CEDEFOP's opinion survey on VET, only 16% of people in the European Union (EU) fully agree with the idea that VET allows continuing into higher education programmes. In addition, the survey also reveals that 70% of interviewees believe that VET is simply about manual work, despite the diversity of jobs which VET now leads to. Evidence suggests that the increases in the number of different career pathways VET can lead to have not been accompanied by improvements in the provision of career support to facilitate the transition to these pathways (Watts, 2010[54]), including those leading towards higher education (OECD, 2012[55]). More and better career guidance is needed to make individuals aware of the benefits and pathways.

Figure 4.10. How vocational education is perceived

Share of people who considered VET has a positive image, and share of people who would recommend VET to young students as an upper secondary education option



Note: The opinion survey was carried out in 2016.
Source: CEDEFOP (2017[42]), "Cedefop European public opinion survey on vocational education and training", *Cedefop research paper*; No 62 http://dx.doi.org/10.2801/264585.

This poor image of and misconceptions about VET contribute to a high concentration of students interested in only a limited set of career options, which are usually linked to academic degrees (OECD, 2019[27]) and not necessarily to the student's academic profile and performance, leading to misaligned career expectations (OECD, 2019[27]). Evidence has shown that teenage career aspirations are not necessarily coherent with the projected labour demand (Maan et al., 2013[56]). For instance, there is a higher interest in VET-related jobs in some countries than in the VET pathways needed to prepare for these jobs, suggesting a misalignment between students' occupational interests and educational aspirations. This suggests a lack of understanding of the role of vocational education (Hargreaves and Osborne, 2017[57]).

Career guidance can mitigate against misconceptions and wrong assumptions about VET by providing young people with fuller insights into the true nature of occupations to broaden and raise aspirations. One way to do so is by providing critical information on VET and its different career pathways, accompanied by direct exposure to these alternatives. For instance, in the Netherlands, the Council of VET schools (MBO Raad) developed a web portal *(ditisMBO.nl)* with basic but essential information on VET and career options. Additionally, ambassadors of fields of studies promote VET programmes by sharing their experiences, challenges, and achievements for each option. Similarly, the Ministry of Education, Culture and Science developed a VET programme choice portal *(kiesMBO.nl)* that provides detailed information on the different fields and career pathways. The portal also includes a matching game helping students navigate through all the VET options and find the programme that corresponds best with their interests and context (Box 4.5). In the Ile de France region in France, an apprenticeship fair (Forum de l'Alternance) is organised annually, where prospective apprentices can meet with employers and training providers, receive information on apprenticeship training, and participate in workshops to learn more about specific sectors. They also receive guidance on how to secure an apprenticeship (e.g. job interview coaching, CV writing tips).

Box 4.5. *Choose VET* website in the Netherlands: Attracting young people to pursue VET careers

'Choose VET' (*Kies MBO*) is a career choice portal with detailed information about all the upper-secondary VET possibilities in the Netherlands. The portal has targeted information for young people, their parents and teachers, helping them understand how VET works and supporting students in navigating all the available programmes. The portal informs students and parents about the VET programmes on offer, their fields of specialisation, the different work-based learning options within each programme, including internships and apprenticeships, and the multiple career pathways and occupations they can lead to. The portal features a VET programme matching game that helps students find the training that aligns best with their context. The portal also provides resources and tools for teachers, advisors and principals to support career education programmes (LOB) in the classroom or through student counselling services.

The portal is an initiative coordinated by the Ministry of Education, Culture and Science and developed by the Organisation for Vocational Education and Business (SBB), in collaboration with the MBO Council (MBO Raad), the Secondary Education Council (VO raad), organisation of young people and business in secondary education (Biond). These parties update figures and information about professions, training, and the labour market. Young people organisations are closely involved in the design and development of the portal to improve the target group's experience.

Source: Ministerie van Onderwijs, Cultuur en Wetenschap (2022[58]), *Kies MBO (Choosing VET)*, www.kiesmbo.nl/.

Collecting and disseminating information on labour market outcomes

Information about labour market outcomes and prospects of different VET programmes and pathways is crucial for career guidance. Evidence for the Netherlands suggests that recent VET graduates who made extensive use of labour market information to guide their education choice have better labour market outcomes than graduates for whom labour market information was a less critical factor in their education choice (Fouarge, Künn and Punt, 2017[59]). Career guidance that is based on skills needs information helps students (and adults) make an informed decision on education and training investment (OECD, 2016[60]). Providing information on skills requirements and labour market outcomes can improve students' beliefs about job opportunities and wages, shifting their education and occupation preferences (De Koning, Dur and Fouarge, 2022[61]). In the Netherlands, for instance, VET students who receive labour market information tend to change their favourite occupation towards an occupation with better labour market

prospects. Similarly, they select the field of specialisation related to occupations with better labour market prospects and choose post-secondary education programmes with higher expected earnings (Hofer, Zhivkovikj and Smyth, 2020[62]).

Despite efforts to provide accurate information to young individuals that allow them to make informed career decisions, detailed information on VET outcomes is not readily available or is not easy to access in many countries. For instance, disaggregated labour market outcomes data, such as employment rates or annual income for graduates from different programmes or performing a specific occupation, is not always available. When it is available, it is not always presented in an attractive and accessible way. Moreover, forecasts of future demand for occupations targeted by VET are often lacking. Some countries have made special efforts to gather detailed information on labour market outcomes from different VET programmes. Information such as employability and salaries is gathered through labour force surveys or similar data sources and made available in an accessible format. Likewise, several countries provide detailed information about occupations and, in some cases, link it to programmes of study leading to those occupations. For instance, the Danish national guidance portal offers many resources to make informed decisions, including detailed job and career information directly linked to each VET programme (Box 4.6).

Box 4.6. Informing about jobs and VET career opportunities

National Guidance Portal (Denmark)

The national guidance portal (www.ug.dk) is an ICT-based career information and guidance portal that provides young people and adults with relevant career information to make qualified decisions about their education, training and careers. The portal aims to offer precise and updated information for everyone in Denmark seeking job, education, business and labour market information. The information focuses on specific target groups, including young people seeking general and vocational upper secondary education.

In addition to general labour market information, the website includes more than 500 job descriptions organised in 20 professional areas (e.g. Construction, plant and other crafts; Food, nutrition and restaurant; Industrial Production, Textile and Clothing, IT and Electronics, among others.). Each job description is linked to one or more education and training opportunities and vice versa (CEDEFOP, 2016[63]). Based on this information, the portal offers 'The job compass' (Jobkompasset). This interactive tool helps students translate their interests in potential occupations and fields of education and provides detailed information about the type of jobs, workplace, income, and future opportunities relevant to each field.

My Skills (Australia)

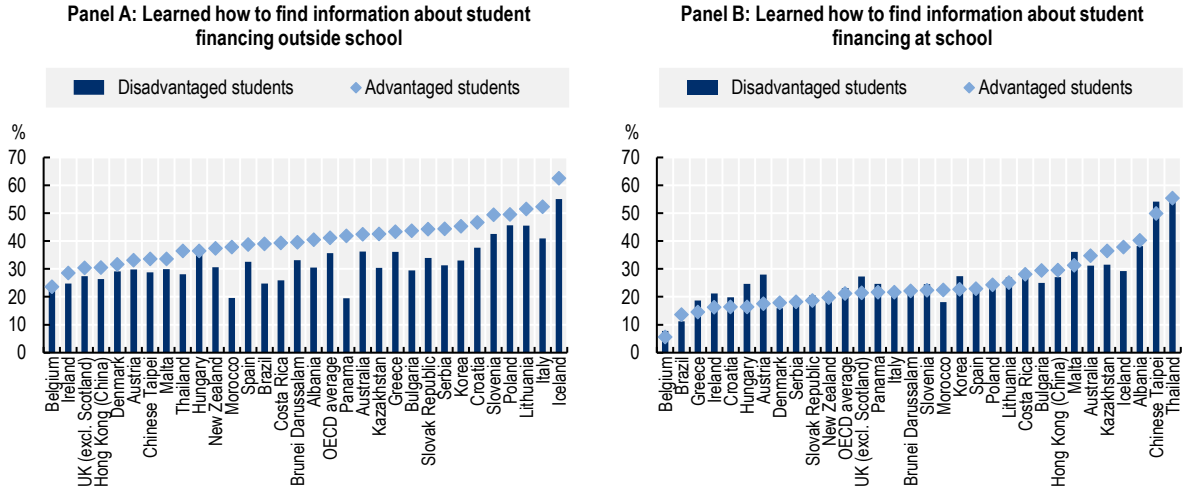
The *My Skills* website (www.myskills.gov.au) is the national directory of training in Australia supporting users to make informed choices through searching and comparing available vocational education and training (VET) courses, and providers. For each course, users can find the average estimated fee, information the availability of subsidies or VET student loans, average course duration, student satisfaction, and availability of online learning options. Users can also see the percentage of graduates in employment further training options, the percentage of graduates who improved their employment status, and the median salary of graduates. The top three occupations and industries employing the graduates are also shown (based on information collected through graduate surveys), providing an indication of the labour market outcomes of students. *My Skills* also features a tool that allows users to find occupations that match their interests, experience, and qualifications.

Providing information on financing options for prospective VET students

Making informed education choices also means considering the costs involved for the different options. Information about financing options for VET students is not always available or easy to understand (Davis et al., 2019[64]). In most cases, information about tuition fees for VET programmes is readily available, but the different support measures for covering such costs are not detailed or are too complex (Evans and Boatman, 2019[65]). Eligibility for public funding and the amounts covered are usually based on individuals' characteristics and subject to specific eligibility requirements. In addition to public support, some educational institutions offer special payment arrangements and scholarships to cover students' tuition fees and living expenses, adding to the complexity for prospective students.

A lack of systematised information on financing options makes the decision process for students (and their parents) substantially complex. This can discourage young students who are financially risk-averse or unaware of the economic benefits of pursuing any educational programme, including VET. Based on PISA 2018 data, on average, only 3 out of 10 students know how to find information about student financing (Figure 4.11), and this proportion is even lower among students from a disadvantaged background – i.e. those who might arguably need it the most. National financing bodies and education and training providers are crucial in making this information transparent and readily available. Prospective students should be able to easily compare the cost implications of the various study options they are considering, including a comparison between VET and general or academic studies. A standardisation of the available information, including the application process for funding, can increase the number and diversity of students enrolled in VET.

Figure 4.11. Students who reported knowing how to find information about student financing



Note: Only countries and economies with available data are shown in this figure. Scotland does not have information available, thus it is excluded in the UK average.
Source: OECD (2019[27]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, https://doi.org/10.1787/47dcfb0d-en.

In several countries, governments have managed to systematise and centralise the information provided by training providers and the government on grants, loans, and other financial support. In England (UK), for instance, the student finance calculator offers information on public funding and repayment schemes based on students' study interests and sociodemographic characteristics (Box 4.7). In the United States, financial aid professionals provide information on financing options for pursuing further studies. These professionals are part of the Federal Student Aid office (FSA) from the Department of Education and

provide information and guidance to prospective students on financial aid and loan options, including support in finding training announcements and linking to other federal or state student aid.

In VET systems with apprenticeship and internship schemes, it is also essential to provide information about salaries and benefits that learners receive during these company placements. Without information on whether or not work placements are paid and minimum and usual salaries for apprentices or interns, prospective learners do not have the full picture to make an informed decision. Most of the information available about the cost and benefits in this matter is oriented towards employers. In Spain, for instance, employers can access guidelines about how to proceed with apprenticeship agreements, pay and conditions, and the financial incentives available. All this information is centralised on the website of the Public Employment Service (*Servicio Público de Empleo Estatal*, SEPE). However, the information about apprenticeships and internships' salaries and support measures for learners is spread over different sources and sometimes lacks clarity. Most websites present information mainly on the requirements and the apprenticeship opportunities, as shown in the SEPE portal.

Box 4.7. The Student Finance Calculator in England (United Kingdom): Providing information about the financial cost of training

The Student Finance Calculator is part of an online toolkit to support students in getting funding for post-secondary education programmes. The objective is to inform (prospective) students who can benefit from the different loans and financial support offered by the UK Government's Department of Education. This toolkit provides information on the eligibility for financial support according to students' socio-economic characteristics and the type of studies or training pursued. The detailed description of the different finance alternatives is provided by characteristics of the studies, intensity (part or full time) or type of student (new or continuing full student).

The Student Finance Calculator estimates the tuition fee and education maintenance loan students can get and how much extra student funding or financial aid can be granted (e.g. for students with care responsibilities or disabilities). Additionally, the website offers valuable resources about how to pay back, how much to repay and when to do it (payments schedule). Students can also access guidelines about the application process.

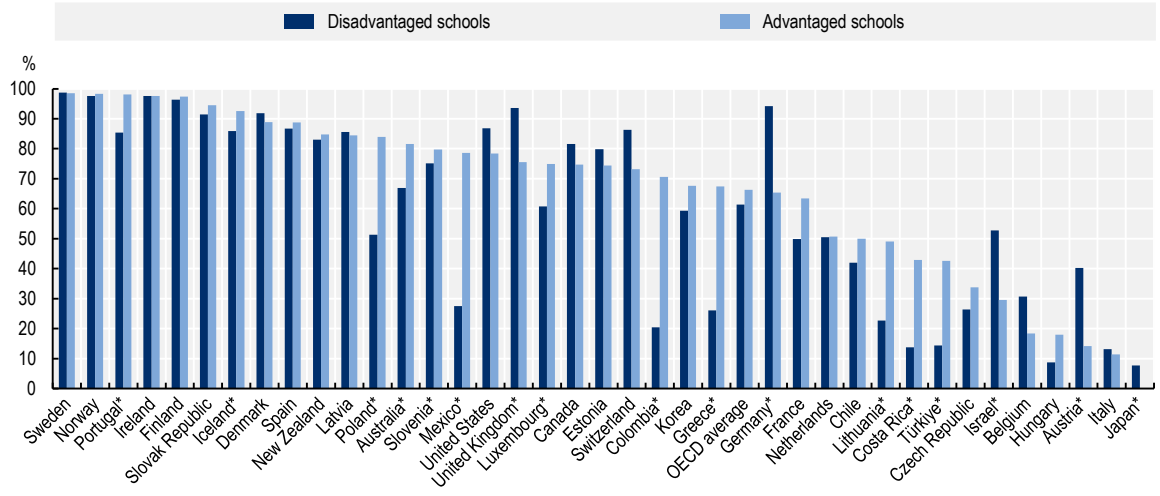
Source: UK Government (2022[66]) Student finance calculator, www.gov.uk/student-finance-calculator.

Targeting disadvantaged students

Access to career guidance varies significantly across countries, but also within countries. PISA 2018 data show an important gap in participation in career guidance between advantaged and disadvantaged students in many countries (Figure 4.12.). Across the OECD, students from disadvantaged schools are less likely to participate in career guidance than those in the most advantaged schools. This fact is particularly striking since students from disadvantaged backgrounds exhibit the most significant challenges in making an informed decision about their careers (Thiele et al., 2016[67]; Yates et al., 2010[68]).

Figure 4.12. Schools where one or more dedicated counsellor(s) provide career guidance

Percentage of students in schools that provide career guidance



Note: Statistically significant differences are marked with an asterisk. For this analysis, the sample is restricted to schools with the modal ISCED level for 15-year-old students. Countries and economies are ranked in descending order of the percentage of students in advantaged schools. The socio-economic school profile is measured by the school's average PISA index of economic, social and cultural status (ESCS), with disadvantaged schools being the ones in the bottom quarter of the ranking of average ESCS index and advantaged schools in the top quarter.
Source: OECD (2019[27]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, https://doi.org/10.1787/47dcfb0d-en.

Career guidance is fundamental for broadening and potentially raising student aspirations and expectations to boost social mobility. Socio-economic context can play an important role in people's aspirations and expectations (Musset and Kureková, 2018[69]; Mann, Denis and Percy, 2020[70]). Young people from rural areas, migrants, and those with low socio-economic status are prone to experience low social mobility and short-sighted career aspirations, particularly if they do not benefit from career guidance (Musset and Kureková, 2018[69]). Low aspirations mentality generate an invisible ceiling on youth educational and labour outcomes. Disadvantaged youth are much more likely to settle for work demanding lower skills than the ones accumulated during their lifetime (CEDEFOP, 2016[71]). Moreover, young people from disadvantaged backgrounds are most likely to demonstrate misaligned expectations due to limited understanding of the role and tasks involved in each occupation, as well as a lack of knowledge of the skills and abilities required (Mann et al., 2020[40]).

Career guidance can help break the influence of socio-economic background and disrupt intergenerational cycles by motivating young people to engage with more (and with the right) education and training and potentially increasing educational and labour outcomes. Disadvantaged students could benefit from inspirational stories and success cases from people with similar backgrounds who have managed to overcome difficulties and find their career paths. Through exposure to the people who do different jobs and from different sectors, young people have the chance to challenge class-based (and gender-based, see below) stereotyping and broaden their aspirations. In France, for instance, the programme Ropes of Success (Cordées de la Reussité) allows young students from rural areas and disadvantaged locations to connect with students and graduates from different VET and university programmes. The Ropes of Success programme aim to expand students' career aspirations by sharing insights from mentors' experiences during their studies and their transition to the labour market (Box 4.8).

Box 4.8. Ropes of success in France: Expanding disadvantaged students' aspirations

Ropes of success (*Cordées de la Réussite*) is a career guidance support programme aimed at building equal opportunities. The programme's objective is to fight against self-censorship and increase the academic ambition of students by providing support, information, and advice throughout their entire education.

The programme is based on partnerships between higher education institutions and upper secondary schools. The "head of the rope" can be a higher education institution, High School Preparatory Classes (Classes Préparatoires aux Grandes Écoles, CPGE) or Higher Technical Section (Section de Techniciens Supérieur, STS). The "roped" can be general, technological or vocational upper secondary schools. These upper secondary schools must be located in pre-selected cities in priority neighbourhoods or remote rural areas. The objective is to provide career guidance support to the most isolated and disadvantaged students.

These partnerships take multiple forms and set up various actions to support students in defining their career pathways. One is through mentorships, where students can meet and interact with higher education students and graduates from different programmes. Pupils are exposed to different types of training, courses and fields of education, and information about labour opportunities and occupations. The support method is gradual and tailored-made. Depending on each student's specific needs, mentors' participation can be more intensive and frequent. Nevertheless, mentorship is not limited to a single connection between a pupil and a student/graduate. It can be carried out through a global support programme to benefit all students from a participating school.

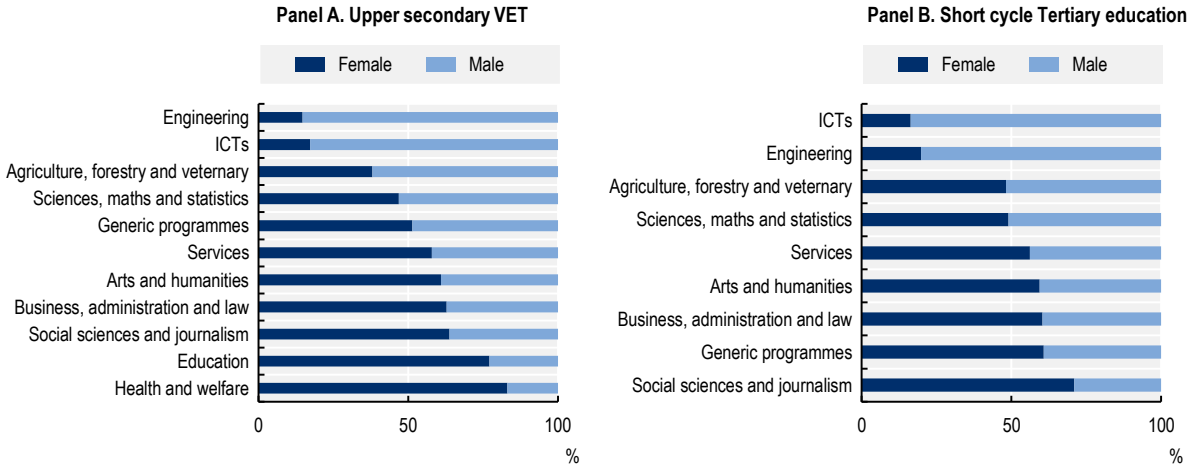
Source: Onisep (2022[72]), The ropes of sucess (Cordées de la Réussite), www.cordeesdelareussite.fr/.

Breaking gender stereotypes

Gender stereotypes can considerably influence students' educational aspirations and career choices, with substantial repercussions on the labour market and society more broadly. PISA data show that girls have higher career expectations than boys at the same level of proficiency, but they are often narrowly focused, for example, in medicine and teaching professions (Mann et al., 2020[40]). Girls also often turn away from STEM (science, technology, engineering and mathematics) professions (OECD, 2019[27]). These gender differences are substantial among VET students (Figure 4.13): girls are overrepresented among graduates from VET programmes in health (where girls account for 83% of graduates) and education (78%) fields, while they are strongly underrepresented in engineering and ICT programmes (18%). Gendered choices contribute to gender segmentation in the labour market, with females often being concentrated in fields which have lower completion rates, lower pay and weaker opportunities for progression (Beck, Fuller and Unwin, 2006[73]).

Figure 4.13. Distribution of graduates from VET per field of education by gender

Share of VET graduates by gender, by field of study and level of VET (OECD average, 2019)

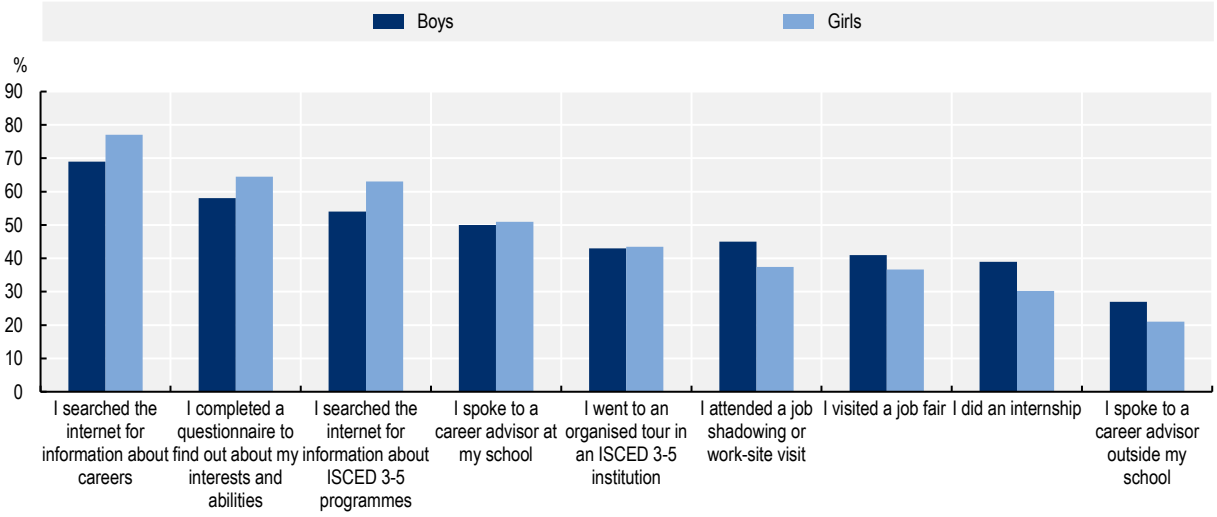


Source: OECD (2022[74]), Students, access to education and participation, *Education at a Glance*, https://stats.oecd.org/.

Providing support and career guidance to all students is imperative to break gender stereotypes in school and beyond. Helping students pursue personal and career goals, independently of their gender, is crucial for developing a more inclusive labour market. Schools can counter stereotypes and help students cultivate a broader perspective on career options, including science, through better career options and better career information (CEDEFOP, 2021[53]). However, many studies find that career guidance services of the same quality are not always available to all students (Mann, Denis and Percy, 2020[70]). Girls are less likely to receive career guidance directly connected to the labour market (Mann et al., 2020[40]; Musset and Kureková, 2018[69]), and for example, are less likely than boys to attend work-site visits or job fairs or participate in an internship or job shadowing (Figure 4.14).

Research suggests that gender stereotyping can deter girls and boys from pursuing specific careers and can be countered by improved information (Brussino and McBrien, 2022[75]). Certain occupations appear so inaccessible to those not of the dominant gender that richer approaches based on first-hand experiences are called for, especially among VET programmes. Employer engagement and direct exposure to the world of work are essential to enable young people to see for themselves and explore whether it is achievable to go against gender norms (Musset and Kureková, 2018[69]). In Canada, for example, young women have the opportunity to participate in workshops and job immersion in skilled trades and technologies occupations to experience trades jobs first-hand (Box 4.9).

Figure 4.14. Participation in career development activities, by gender, 2018



Note: OECD average of countries that completed the 2018 PISA Educational Career questionnaire.
Source: OECD (2019[27]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, https://doi.org/10.1787/47dcfb0d-en.

Box 4.9. Skilled Futures for women in Nova Scotia, Canada: Boosting girls' participation in skilled trades careers

Skilled Futures is a series of one-day career exploration events for junior high and high school students in Nova Scotia, Canada. The programme offers the opportunity to participate in interactive skilled trade and technology workshops. It is offered to groups in-person at training facilities throughout the province of Nova Scotia and through a virtual experience including informative videos and activities related to different trade sectors.

The Skilled Futures programme has several chapters. One is Skilled Futures for Women, which introduces female students to career opportunities in skilled trades and technologies. In this chapter, girls have the opportunity to explore the possibility of a career in different fields by attending workshops and visiting workplaces. Skilled Futures for Women also shares valuable information, tips and stories on its website. Recently, it has included a one-on-one interview series with women to inspire young girls to pursue their future careers in skilled trades and technologies. These women share their experiences and success stories working in various skilled trade industries. Moreover, the Skills Future programme runs a competition at the post-secondary and apprentice levels where all participants, including young women, can perform and show their skills and abilities in trade-related fields such as carpentry, bricklaying and electrical installation.

The Skills Canada - Nova Scotia office runs the Skilled Futures and its chapters. It involves multiple partners, from trade colleges to companies and organisations relevant in each sector.

Source: Skill Canada Nova Scotia (2022[76]), Helping young Nova Scotians become job-ready through skills training, www.skillsns.ca/.

Providing career guidance at an early stage can also help prevent the emergence of stereotypical perceptions of specific educational and career paths (Howard et al., 2015[77]). For instance, Denmark celebrates girls' day for students from 5th grade by providing information about occupations where women are underrepresented, promoting STEM professions, and offering multiple interactive activities where companies and organisations actively participate. Similarly, in Germany, secondary students celebrate boy's days which are aimed at attracting young males into the types of jobs where their gender is underrepresented, such as kindergarten teacher, nurse and florist.

Investing in the quality and effectiveness of career guidance activities

While there is an apparent demand for more and better career guidance (Moote and Archer, 2017[78]), relatively little is known about what works and what does not. There is widespread concern that current career guidance services are relatively poorly sourced in schools, staff are inadequately prepared to deal with labour market issues, and the advice may lack objectivity, which may limit students' career choices (Watss, 2009[79]). Very often, the implementation of career guidance programmes is not following the needs of the learners, and they usually fall into routine administrative activities, handling cases in a narrow view (Martaningsih, 2018[80]).

The need for more effective and high-quality career guidance and counselling underlines the importance of monitoring and evaluation systems to ensure service quality. Yet, countries face limitations in developing quality assurance mechanisms and guidance provision approaches. Career guidance services lack consistent evaluation and monitoring systems to properly track the quality, weaknesses, obstacles to service implementation, and potential utilisation of the programme and the activities involved, which may hinder career guidance effectiveness (Martaningsih, 2018[80]). To a certain degree, this is due to the lack of general frameworks for designing and computing systematically relevant indicators. The evidence suggests that even when data are used for accountability purposes, short-term user feedback, improving services delivery, improving training programmes for career practitioners, or improving career guidance tools, some governments lack the resources and knowledge to use the information for monitoring and evaluating purposes. Governments also have limited experience implementing these methodologies for this purpose (CEDEFOP, 2022[81]).

Some specific guidance service providers may have adopted their own monitoring systems or data collection routines, whether internal or external; however, methodologies and baseline indicators are very diverse. There is a need for standardised and coordinated monitoring and systematic evaluation of career guidance activities (Barnes et al., 2020[82]). Especially among career guidance providers in situ, there is no agreement on what are relevant results of the interventions, ranging from variations in employment status or qualification attainment, career learning outcomes, wellbeing, career progression or satisfaction levels, or a combination of all (Percy and Dodd, 2020[83]) (McCash, Hooley and Robertson, 2021[84]). Nonetheless, evaluation and monitoring systems can be adequately established, as was done in VET upper secondary schools in Egypt and Germany, where the assessment focuses on a specific set of indicators (e.g. employability, labour market and career opportunities). This may limit the scope of the analysis but allows for better tracking of potential improvements (ILO and GIZ, 2018[85]).

To evidence the performance of career guidance services, accurate observation and measurement through programme evaluation activities are needed. As a first step, a reliable framework must define principles on how career guidance should be delivered to support young people to make informed decisions. In England (UK), for example, the Gatsby Benchmark was developed to define what world-class career provision in education looks like and to provide a framework for organising the career provision at any school or higher education institution (Box 4.10). The Careers and Enterprise Company supports the implementation of the benchmarks with a national network of support, resources and targeted funding. It has conducted research establishing a group of indicators, supported by the University of Derby, which have gathered evidence on the effectiveness of the benchmarks.

Box 4.10. A pilot of the Gatsby Benchmarks in England (United Kingdom): Assessing career guidance services

About the benchmarks

The Gatsby Benchmarks are a framework for good career guidance developed to support secondary schools and colleges in providing students with the best possible career education, information, advice and guidance. Based on international best practices, the benchmarks set out what a world-class career guidance system looks like. The benchmarks are part of the career strategy, launched in December 2018, and statutory guidance for secondary schools and colleges since 2018.

The framework includes eight benchmarks that aim to improve career guidance programme: 1) a stable careers programme; 2) learning from career and labour market information, 3) addressing the need of each pupil; 4) linking curriculum learning to careers; 5) encounters with employers and employees; 6) experiences of workplaces; 7) encounter with further and higher education; and 8) personal guidance. These benchmarks result from analysing good practices in six countries (Canada, Finland, Germany, Hong Kong (China), Ireland and the Netherlands) where career guidance and educational outcomes are considered good. The conclusion of this analysis is presented in detail in the Good Career Guidance report (The Gatsby Foundation, 2017[86]).

About the pilot

A pilot was set up to explore how schools and colleges could best systematically attempt to implement the Gatsby Benchmarks, evaluate how they were implemented, and identify what impacts might result from this. The International Centre for Guidance Studies (iCeGS) at the University of Derby chose the North East Local Enterprise Partnership (NE LEP) as a place to host the pilot. The participant education providers received limited funding and worked with a pilot facilitator to implement the eight benchmarks over four years.

The evidence suggests that implementing the Benchmarks produced favourable results (Hanson et al., 2021[87]). At the start of the pilot, 50% of the schools and colleges were achieving no benchmarks, and no institution was achieving more than three. But after two years, over 85% reached between six and eight benchmarks, with three institutions achieving all eight. Beyond the benchmark implementation rate increase, the evaluation assesses multiple student outcomes presenting positive impacts. For instance, the student career-readiness score (a measure of preparedness for work) showed significant increases in all year groups across the four years of the evaluation. The teaching staff also observed fundamental changes in learners' engagement in class. The participant schools saw a fall in the number of NEET students from 50% to 14% in two years.

Source: The Gatsby Foundation (2017[86]), *The Gatsby Benchmarks, Good Career Guidance,* www.goodcareerguidance.org.uk/; Hanson et al. (2021[87]), *An Evaluation of the North East of England Pilot of the Gatsby Benchmarks of Good Guidance*, www.gatsby.org.uk/uploads/education/ne-pilot-evaluation-full-report.pdf.

Informing adults about learning opportunities in VET

Characteristics of career guidance for adults

Career guidance for adults is usually provided by public employment services, private providers, and education and training institutions (OECD, 2021[44]). In some cases, employers can also provide career guidance to their employees to support their professional development and career decisions. Usually, these services provide information about a broad range of education and training options, including formal education and training (e.g. VET, higher education programmes, second chance programmes) and non-formal learning opportunities.

Career guidance services for adults usually involve one (or more) of the following activities: i) providing information to adults about existing career alternatives in the labour market based on their professional profile and interests; ii) identifying and discussing users' professional strengths and areas for improvement; iii) providing users with information about education and training alternatives to strengthen their professional profiles and improve their employability; and iv) informing users about labour market trends in different industries so that they can learn about growing occupations and emerging jobs, and their related education and skills requirements.

The delivery of career guidance for adults is still done mainly through face-to-face sessions with career counsellors. However, career guidance services have diversified in the last decades to remote alternatives, including telephone, instant messaging or video conference (OECD, 2021[44]). Moreover, and as previously discussed, face-to-face delivery is usually complemented with online information and interactive tools. These can help adults understand labour market trends and identify relevant education and training alternatives to upskill and reskill (including VET).

Career guidance can also provide information on financial and non-financial incentives to support adults in undertaking those activities (e.g. subsidised VET courses, loans, fee waivers, apprenticeship salaries). Career guidance for adults is often targeted at groups that are most in need of training or face large barriers to training participation (see examples in Box 4.11). In many countries, targeted career guidance services are provided to low-skilled adults, as they generally have low participation rates in adult learning. In Iceland, for example, specialised career and vocational counsellors provide career guidance to low-skilled adults across the country (Box 4.11). Moreover, various countries have been providing dedicated career guidance services to older adults, recognising the need to help them navigate a changing labour market when they want to improve their career prospects or search for a career change. In Switzerland, for instance, the VIAMIA programme is tailored to middle-aged adults looking for information on professional development activities, such as VET studies. The programme is supported by a wealth of online complementary information and tools (Box 4.11).

Participation of adults in career guidance

Nearly all OECD countries have put in place some sort of career guidance for adults. These services are provided by a variety of actors, including public employment services (PES), dedicated public career guidance services, private providers, associations and social partners. According to the OECD Survey of Career Guidance of Adults (SCGA), 43% of adults have spoken with a career guidance advisor over the past five years across the six analysed countries (Chile, France, Germany, Italy, New Zealand and the United States). Most adults who used career guidance services had multiple interaction with advisors. OECD (2021[44]) shows that the vast majority of adults who do not use career guidance services simply do not feel they need to (57%). Older adults and those with lower levels of education are over-represented in this group. Another 20% of non-users reported not knowing that career guidance services existed. Other less significant barriers include lack of time (for work or personal reasons) (11%), high costs (4%), inability to find a career guidance advisor (3%), poor quality of services (2%), or inconvenient time or place of service delivery (2%).

In general, adults are not actively looking for information about learning opportunities. According to data from the European Adult Education Survey, one in three adults (35%) have searched for information on formal and non-formal education and training (Figure 4.15). Rates spanned from less than 20% in Hungary, Lithuania and Türkiye, to over 50% in Denmark, Luxembourg, the Netherlands and Slovenia. According to OECD (2021[44]) analysis, there is evidence that countries with more robust career guidance services have a higher share of adults actively searching for information on learning possibilities.

Box 4.11. Examples of career guidance services for low-skilled and older adults

Iceland

In Iceland, Lifelong Learning Centres provide education and career counselling with qualified counsellors specialising in education and vocational counselling with a specific focus on low-skilled adults. The objective is to strengthen the variety and quality of education and encourage general participation in lifelong learning and education. The centres' reach is broad: there are dozens of Lifelong Learning Centres around the country, including in sparsely populated areas, which conduct around 10 000 guidance counselling sessions with adults with low qualification levels per year (OECD, 2019[88]).

Flanders (Belgium)

In Flanders (Belgium), lifelong guidance in formal **adult education** is under the responsibility of adult education centres (CVOs) and centres for basic education (CBEs). Both centres offer learners of different characteristics guidance and orientation services, including study support and career counselling. Also, several socio-cultural organisations in alliance with CVOs have initiated lifelong guidance projects at the province level explicitly aimed at reaching low-skilled adults. For instance, *Leerwinkel* (learning shop) offers detailed information and guidance about learning opportunities, including basic courses such as language programmes oriented to immigrants (Departement Onderwijs en Vorming, 2022[89]). Moreover, the Flemish Public Employment Service (VDAB) offers job placement, training and education, career guidance and outplacement services. VDAB provides guidance to specific target groups, including older adults (55+), individuals with special needs, socially disadvantaged groups, and non-Dutch speakers (Euroguidance, 2022[90]). VDAB provides specialised guidance for low-skilled adults offering suitable job opportunities and additional information on job-relevant training options (VDAB, 2017[91]).

Denmark

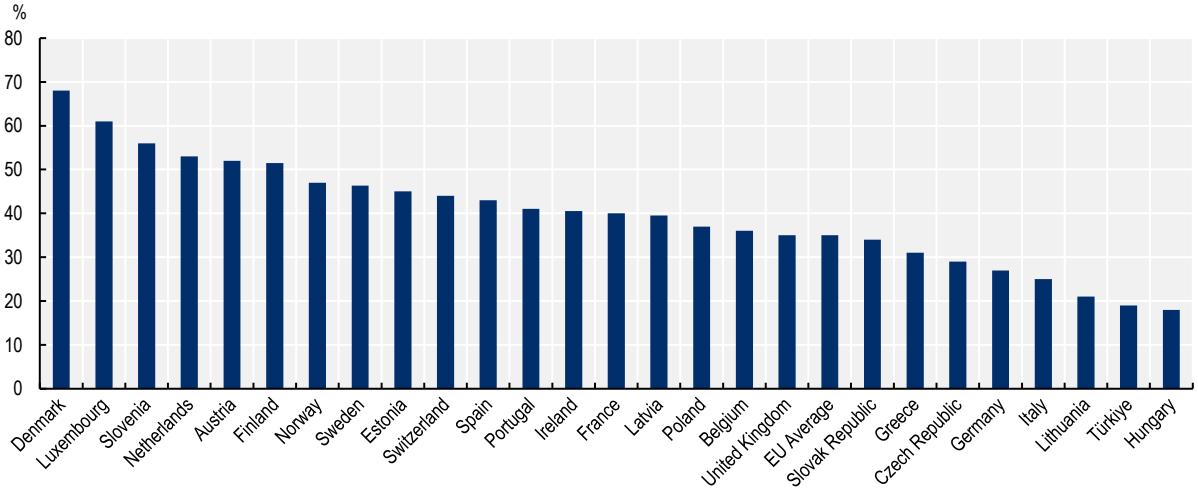
In Denmark, Centres for Adults Education and Continuing Training provide guidance to both employed and unemployed adults. At each of the thirteen centres, guidance counsellors provide free advice to companies and individuals. The guidance includes the provision of information about further education and training programmes available to adults. People outside of the labour market or low-skilled adults can get an overview of various education and training programmes by receiving an individual plan for their further education and training, which can lead them towards their career target (CEDEFOP, 2016[63]).

Switzerland

In Switzerland, the VIAMIA initiative of the confederation and the cantons offers a free professional assessment to people aged 40 and above. Career counsellors provide personalised advice based on individuals' professional situation, goals and needs, as well as support in exploring job and educational opportunities for career development. The initiative includes several components: analysis of the current professional status, assessment of knowledge and skills, information about labour market trends and insights about how to develop individuals' professional potential through training and further education, targeting mainly adults in need of up- and re-skilling. VIAMIA offers in-person career guidance services in all cantons, but it also has an online portal for carrying out independent analysis. (DuALPlus, 2022[92]).

Figure 4.15. Adults' search for information on learning opportunities for themselves

Share of adults having searched for information on formal and non-formal education and training in the previous 12 months, 2016



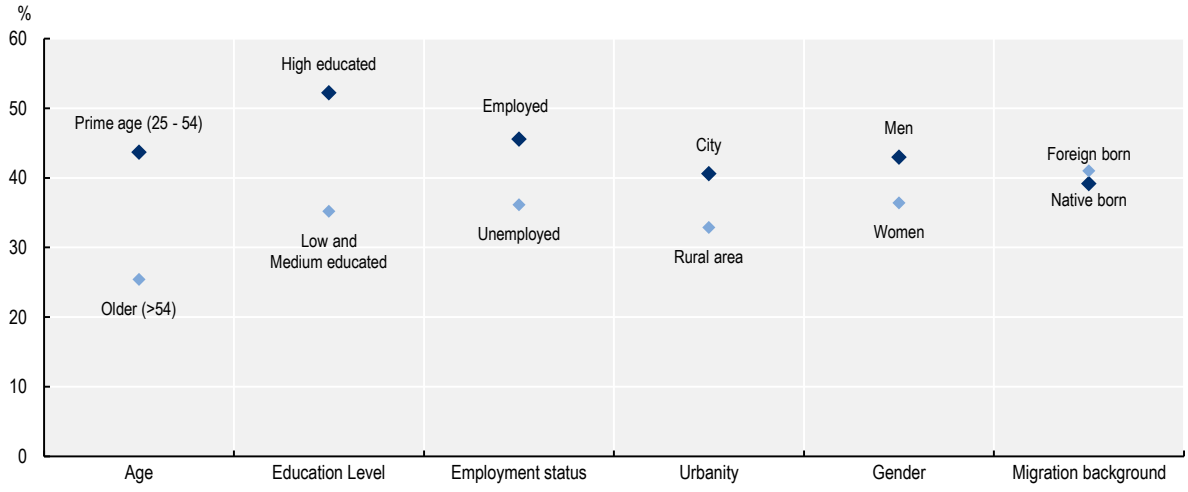
Note: This figure is based on the module of the Adult Education Survey on accessing information about learning possibilities and guidance. The question used was "During the last 12 months, have you looked for any information concerning learning possibilities (either on formal or non-formal education and training)?".
Source: Eurostat (2016[93]), Adult Education Survey, https://ec.europa.eu/eurostat/web/microdata/adult-education-survey.

The use of career guidance services also varies within countries, and evidence suggests that the groups most in need of advice – e.g. those who are already struggling in the labour market and/or need training but are not getting it – are the ones who have limited access to career support. Connecting adults who need career guidance the most with available services is challenging but could improve training participation rates and labour market outcomes for disadvantaged groups. Figure 4.16 shows differences in the use of career guidance services between adults with different personal and work characteristics in eleven OECD countries (OECD, 2021[44]). The most significant gaps are found between prime-age adults (25-54) and older adults (over 54) (18 percentage points), followed by high- and lower-educated adults (17 percentage points) and adults living in cities and rural areas (8 percentage points). Employed adults are more likely to engage with career guidance than unemployed ones. By contrast, other potentially disadvantaged groups take up more career guidance than their counterparts. This is the case, for example, for foreign-born adults (2 percentage points difference compared to native-born adults), who may be more proactive in seeking advice and guidance as they have more unstable work conditions (OECD, 2021[44]). Persons working in occupations with a high risk of automation also tend to be more likely to use career guidance services than those in occupations with lower risk (OECD, 2021[44]).

There are several reasons why adults seek career guidance and use multiple means to access career information (e.g. on line). The most common reasons to seek career guidance are related to job-search and job-progression (59%), followed by receiving information on education and training options (25%). In both cases, providing up-to-date information on labour market needs, as well as employment, education, and labour-relevant training opportunities such as VET programmes, play an important role. Instead of seeking advice from career guidance advisors, many adults look independently online for information which in most cases is about education and training programmes (35%).

Figure 4.16. Use of career guidance services, by socio-economic and demographic characteristics

Percentage of adults who have spoken with a career guidance advisor over the past five years, by group



Note: Unweighted average for the eleven countries covered by the SCGA: Argentina, Australia, Brazil, Canada, Chile, France, Germany, Italy, Mexico, New Zealand and the United States. The sample size of foreign-born adults is smaller than 50 observations in Argentina, Brazil, France, Italy, Mexico and the United States. The low and medium educated category includes individuals with less than a bachelor's degree.
Source: OECD (2021[44]), *Career Guidance for Adults in a Changing World of Work*, https://doi.org/10.1787/9a94bfad-en.

Helping adults find their way to VET

There is a common perception in some countries that career guidance and VET programmes mainly concern young people in school. Nonetheless, there is substantial demand for career guidance among adults aimed at providing information and support regarding VET options (Watts, 2010[54]). Building a solid career guidance service system is therefore imperative to ensure that all adults, including the most disadvantaged, can access the assistance they need to make well-informed education, training and career choices. This section covers the main challenges and opportunities that career guidance services face to provide adults with information and support regarding their re- and up-skilling decisions. In addition to the challenges described below, many of the challenges and opportunities for strengthening career guidance for young people that are discussed above apply similarly for adults, including issues related to information on funding and the need to break gender stereotypes.

Fostering career changes

In an era of changing skill needs, due to factors such as the green and digital transition, some workers may need to change sectors and/or occupations. For example, 14% of workers in OECD countries are in jobs that are likely to become fully automated in the coming years, and these workers need to reskill to move into less automatable jobs (Nedelkoska and Quintini, 2018[94]). Likewise, the green transition is likely to displace workers from polluting sectors, who require opportunities for reskilling to transfer into greener jobs. However, as discussed in Chapter 3, many workers do not participate in training and have limited motivation to do so. In fact, certain workers with a high probability of needing reskilling in the not-so-distant future, such as those in jobs at high risk of automation, have relatively low training participation rates.

Lack of preparedness and limited access to guidance and information affects adults' attitude toward learning (Topală, 2014[95]), hindering their possibility of reassessing career paths and considering different career options. Some adults see changing careers as a risk, especially those who have been in the same sector for many years and low-skilled workers. These adults may have a limited understanding of potential retraining pathways and require additional support to reflect on career moves and retraining efforts that

better align with labour market needs (OECD, 2021[26]). Similarly, a career change for most adults may imply a return to school, which requires time and resources (Donohue, 2007[96]). As discussed in Chapter 3, VET could be an attractive pathway for adults who want or need to reskill, as it provides opportunities closely linked to the labour market. Finding the proper training can be troublesome without guidance and support, especially for adults struggling mentally to reassemble their career blueprint.

Counsellors and advisors have an essential role in helping to overcome these limitations. On the one hand, they can provide insights about the relevance of finding new career paths, and on the other, access to clear information about the training options that can facilitate such transitions. In Germany, career guidance and support are provided to *'Quereinsteiger'* (i.e. career changers), helping them get the right skills and fashioning their CVs to become more competitive in the labour market. The Federal Government of Germany has developed a website providing detailed information on reskilling pathways and job opportunities for people interested in changing career paths. In Switzerland, *'Orientation.ch'* is an online portal providing career guidance and support to adults who want to change jobs and professions. The portal provides a guideline for adults to work on a multi-step career path plan which involves reflecting on one's interests and skills, getting informed about job opportunities, defining career expectations and exploring learning opportunities (Box 4.12).

Box 4.12. 'Career orientation' for changing career path in Switzerland: Providing guidance for planning a new career path

The Swiss Center of Professional Education Services (SDBB | CSFO) developed a portal dedicated to providing career guidance and information to young people and adults called ***"Orientation.ch"***. The platform contains comprehensive information on professions and further education. With www.orientation.ch/carriere, a new section of the platform was developed in 2021 to address adults who are concerned with the development of their careers without directly considering further education programmes. This is in line with the Swiss national strategy for career guidance adopted by the Swiss Conference of Ministers of Education in 2021, according to which adults should be made more aware of the importance of proactive career management (Berufsbildung, 2021[97]).

The aim of the platform is guiding adults interested in changing career paths, either by moving to a different position in the same sector, moving to a different sector conducting a similar task, or changing both position and sector. The platform provides information for users to reflect on their motivation for changing careers. It also has 12 short questionnaires in three areas: Assessing skills, knowledge and level of education; Evaluating professional motivation and interest; Assessing adults' knowledge of the options and opportunities available. Based on the information collected, adults can plan their transition toward a new career path by following five steps: 1) Knowing their interests and skills; 2) defining professional expectations; 3) Reconciling private and professional life; 4) learning about professional development opportunities; and 5) making a choice a reality. There is also complementary information available at the canton level about labour market trends and training opportunities, including the costs, time, and requirements.

Source: Orientation (2022[98]), Change jobs and grow (Changer d'emploi & évoluer), https://carriere.orientation.ch/objectifs-de-carriere/changer-demploi-evoluer.

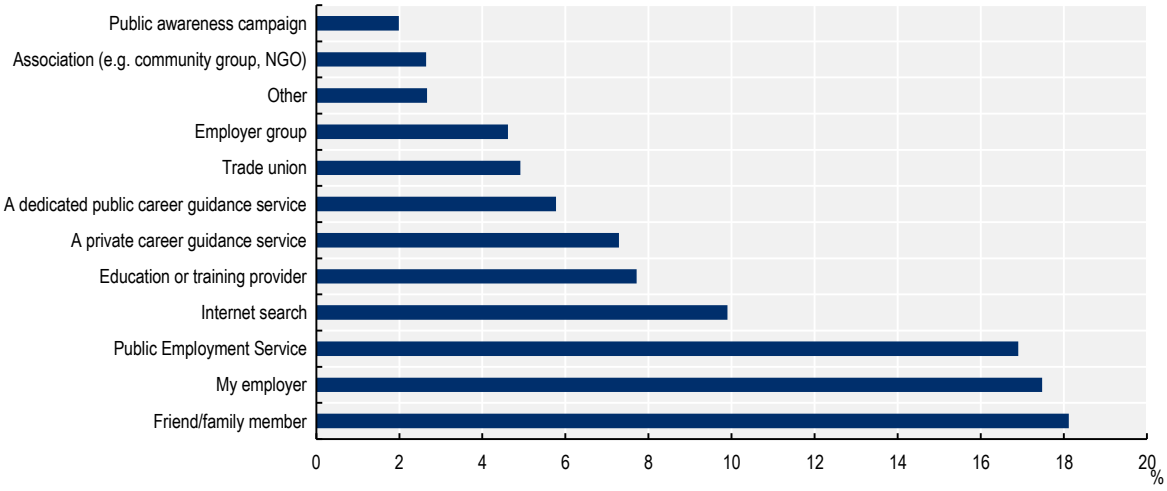
Raising awareness about career guidance services for adults

As described above, many adults report not seeing a need for career guidance support or not being aware of existing services. As career guidance can support all adults in making better educational and career decisions, awareness of the need and importance should be raised.

Raising awareness about career guidance requires actions on many fronts. Some strategies are more effective than others, and their effectiveness often depends on the target population and their interests. Among the countries participating in the OECD Survey of Career Guidance for Adults, most of the career guidance beneficiaries received information about the service through Public Employment Services (PES) (20%) (Figure 4.17). Another 18% received information from a friend or family member, and another 17% from their employer. This reveals the heterogeneity among career guidance users, with the unemployed being more likely to obtain information via PES and workers more likely to be informed by employers. This highlights that different mechanisms are needed to inform and increase awareness of guidance services.

Figure 4.17. Advertisement of career guidance services for adults

Percentage of adults who spoke with a career guidance advisor over the past five years, by institution who notified them about the service



Note: Unweighted average for the eleven countries covered by the SCGA: Argentina, Australia, Brazil, Canada, Chile, France, Germany, Italy, Mexico, New Zealand and the United States.
Source: OECD (2021[44]), *Career Guidance for Adults in a Changing World of Work*, https://doi.org/10.1787/9a94bfad-en.

In recognition of the lack of awareness about the importance of career guidance for adults, several countries have set up public career guidance centres with the purpose of providing guidance to all adults, regardless of employment status, age or income (OECD, 2021[44]) (see centres in Scotland in Box 4.4). These centres are funded by the state and usually have specialised staff with knowledge about the wide range of possibilities for professional development, including VET studies for adults. In some cases, such centres are focused on working with older adults or other groups with particular training needs (Box 4.11). Recently, and especially since the COVID-19 pandemic, many of their services moved online or now include online tools as part of their offer.

Additional tools and strategies can be implemented to raise awareness of such centres and of career guidance more broadly. Having ready-to-use information about the providers of career guidance can help adults navigate the landscape and find the providers that are most relevant for them. For instance, in France, through the website "*Mon conseil en évolution professionnelle*, *Mon CEP*", adults access tailored information about the importance of career guidance and the different providers offering career guidance services (Box 4.13). In Greece, the National Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP) requests private career guidance providers to register in an effort to inform the public about available programmes and promote quality among private providers (Box 4.13). In addition, EOPPEP developed an online Lifelong Career Development Portal with various career development tools and services.

Box 4.13. Informing people about career guidance services

Mon CEP (France)

In France, all employed and unemployed adults have access to free career development advice, *conseil en évolution professionnelle (CEP).* These services are delivered by a set of public and private providers. For jobseekers, the services are delivered by the PES. Users can find their professional development advisor on the website *"Mon conseil en évolution professionnelle, Mon CEP"*. Depending on their personal situation (e.g. employment status, age, disability) and location, the website forwards the user to the specialised CEP organisation in charge. On the websites of these organisations, users find information on the means of communication (individual or group counselling, online or in-person) and other helpful information.

Employers must inform their employees of the right to use the CEP as part of the biannual professional interview. The Labour Code provides for a professional interview every two years between the employee and the employer. This mandatory meeting is intended to help the worker consider professional development and training prospects.

Lifelong Career Development Portal (Greece)

The National Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP), operating under the supervision of the Minister of Education and Religious Affairs, has a register of private career guidance providers. The register has the dual purpose of informing the public about available programmes and promoting quality among private career guidance providers. Career guidance providers included in this catalogue receive preferential support from the Ministry of Labour when applying for European programmes as providers of career guidance services.

In addition, the EOPPEP has developed the Lifelong Career Development Portal, which provides services for career development and mobility information targeted to adults of all ages. People can register to the portal and receive newsletters and regular information on all career guidance services, including online career tests, e-counselling services and an online Lifelong Career Portfolio development tool.

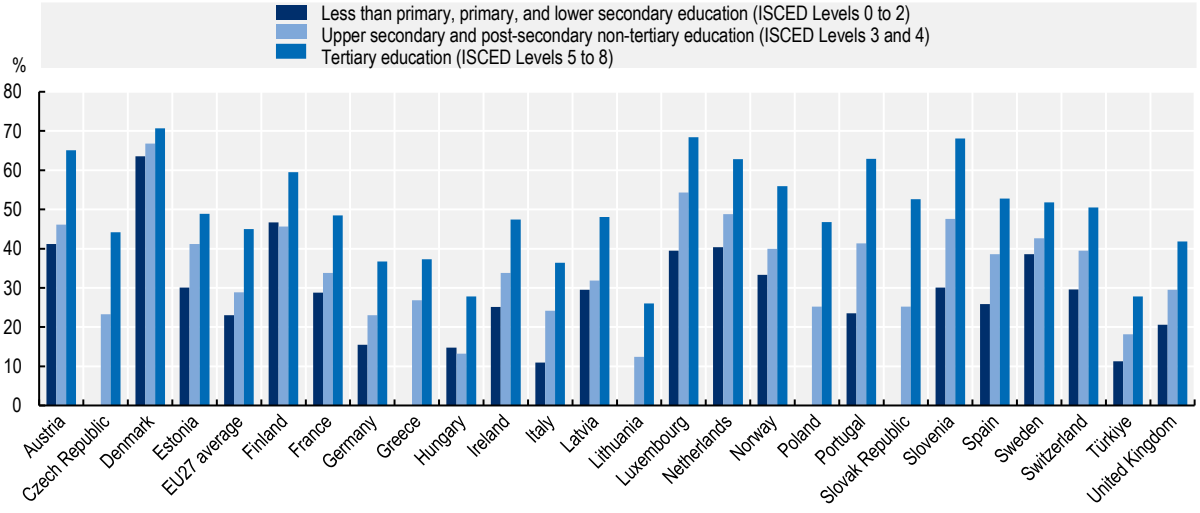
Source: MON-CEP (2022[99]) Mon Conseil en Évolution Professionelle - https://mon-cep.org/ EOPPEP (2022[100]) Career guidance, employment support and other information services in Greece, www.eoppep.gr/index.php/en/counseling-a-vocational-guidance-en/euroguidance-national-centre-1.

Reaching vulnerable groups

As discussed in Chapter 3, adults with low levels of qualifications and/or cognitive skills have limited opportunities to develop their skills further through education and training (OECD, 2019[88]). Moreover, low-skilled adults often face limited aspirations and low career expectations, making them, in most cases, perceive low-skilled work as a reflection of their natural place and identity. The lack of guidance, information and support can perpetuate this vicious cycle hindering adults' participation in further education and discarding better job opportunities (Sissons, 2020[101]), which impedes social integration (Brand-Gruwel, Moekotte and Ritzen, 2017[102]). VET programmes can support low-skilled adults in developing labour-market relevant skills while at the same time closing basic skills gaps (see Chapter 3). Tailoring basic skills programmes to low-skilled workers' work contexts and embedding them into vocational training can make them more relevant, attractive, and ultimately effective for low-skilled workers (OECD, 2020[103]). Contextualising basic skills content can have several benefits in terms of engaging and retaining low-skilled adult learners, improving their attitudes towards learning and self-confidence, and resulting in the skills used and maintained in the workplace.

Providing career guidance, including information on VET options, to low-skilled adults is imperative to transform their view of themselves as learners and expand career expectations and potential job opportunities (CEDEFOP, 2016[71]; Wojecki, 2007[104]). However, adults with lower levels of qualifications are less likely to feel a need to speak with a career guidance counsellor (Figure 4.16) than those with high levels of qualifications. Likewise, they are less likely to search for information on learning opportunities (Figure 4.18): In the EU, 45% of adults with a tertiary education qualification search actively for information on learning possibilities, whereas 23% of adults with less than lower secondary education do so. One reason for this is that adults with low skill levels find it more challenging to recognise their learning needs (Windisch, 2015[105]). Tailored guidance and outreach are needed for this group of adults. For instance, in Poland, the Polish Agency for Enterprise Development (PARP) delivers the programme "Every employee is important – raising the competence of low-skilled workers", which provides information and career guidance to workers with low levels of qualifications (Box 4.14). This programme includes a diagnosis of companies' training needs and offers motivational workshops and soft skills training, together with information about training on specific job-relevant skills. Evidence suggests that this programme positively impacts training engagement, especially among the lowest-skilled workers (Wolińska et al., 2015[106]).

Figure 4.18. Search for information on learning possibilities (2016)



Source: Eurostat (2016[93]), Adult Education Survey, https://ec.europa.eu/eurostat/web/microdata/adult-education-survey.

Box 4.14. 'Every employee is important' programme in Poland: Guiding low-skilled adults

The Polish Agency for Enterprise Development (PARP) Poland has developed a comprehensive training and counselling framework to improve the vocational desirability and employability of workers with low levels of qualifications through the provision of VET programmes. The project titled "Every employee is important – raising the competencies of low-skilled workers" *(Każdypracownik jest ważny – podnoszeniekompetencjipracowników o niskichkwalifikacjach)* involves counselling and educational interventions adjusted to vocational needs of low-skilled workers and their specific competence gaps at work.

The programme has two main components. The first focuses on diagnosing companies' human resources and training needs, with particular emphasis on low-skilled employees, training for entrepreneurs and management staff, and training for workers in low-skilled jobs. The second component includes motivational activities and career counselling to prepare low-skilled workers to participate in vocational training and develop socio-emotional competencies (soft skills). The main objective of the counselling support is to change the attitude of low-skilled adults towards learning and to inform them about the VET learning opportunities available. Information about the programmes and training opportunities for low-skilled workers in each company is customised to the workers' skill needs and company skills requirements.

The "Every employee is important" programme positively affects different educational and labour market outcomes for low-skilled adults, especially those with the lowest level of education (e.g. primary education or less). According to (Wolińska et al., 2015[106]), the information and career guidance provided increase adults' engagement with training in the workplace and outside of it.

Source: Wolinska et al (2015[106]), *Each employee is important - Project experience (Każdy pracownik - doświadczenia projektu)*, Polish Agency for Enterprise Development (PARP), www.parp.gov.pl/files/74/591/15512.pdf.

Another group of adults for whom career guidance could be of particular benefit are migrants. Migrants face several challenges in adapting to the circumstances in their new country. They may find it hard to navigate and enter the labour market and/or education and training system. For many, opportunities to recognise their qualifications, skills and experience, as well as opportunities to develop their language skills and vocational competencies, are crucial components that contribute to adapting to the labour market and society more broadly. As highlighted by OECD (2019[107]) analysis, VET could be an effective tool for integrating migrants, provided that the VET system and programmes are flexible and permeable (see Chapter 3).

Migrants' lower participation rates in adult education are associated with a lack of guidance and counselling on learning opportunities. Across the EU, about a quarter of the foreign-born use such services, against one-third of the native-born (OECD/European Union, 2018[108]). Educational and career guidance becomes essential in supporting the newly arrived on their journey towards social inclusion, especially when such services are seen as part of a connected set of integrated systems. These include skills assessment, accreditation of prior learning, goal clarification, enhancement of employability and advocacy to combat prejudice and discriminatory practices (Sultana, 2022[109]). For example, migrants and refugees in Germany have access to tools for assessing skills and recognising and validating their previous qualifications. It includes a computer-based skill assessment tool for evaluating informal learning or validating credentials when official documents, including assessment tests, are not available (Box 4.15). In the context of labour market integration, career guidance can facilitate access to vocational education and training – including apprenticeships – subsidised job placement and strategies to make the engagement of the newly-arrived attractive to employers. Advice on language learning and job-related training opportunities should be individualised when possible - and delivered by independent, impartial counsellors.

Box 4.15. MYSKILLS in Germany: Supporting refugees to validate their competencies and skills

In 2012, the Federal Government passed the Federal Law on the Recognition of Foreign Qualifications (BQFG), covering both regulated and nonregulated professions. As part of the law, other means can be used to assess the credentials of refugees who lack documents, including assessment tests or expert interviews (Loo, 2016[110]).

The skill recognition system of the German Public Employment Service (*Bundesagentur für Arbeit*, BA) includes a computer-based skills identification test, "MYSKILLS", – developed with the Bertelsmann Stiftung. The assessment takes around four hours and is done under the supervision of an expert at the public employment service. Testing is currently available in twelve languages and is rolled out to a total of 30 professions. The tool is mainly oriented to migrants or refugees with vast experience in a trade but with no formal qualification validated in Germany. These tests have been designed and developed in cooperation with employers' associations, and this cooperation has ensured compatibility between the validated skills and qualifications and job requirements.

Before sitting the test, individuals can take a self-assessment online of how much experience they already have in a profession and get an impression of which additional skills are required (meine-berufserfahrung.de). Based on this self-assessment, the individual and the counsellor at the employment agency or job centre can decide which MYSKILLS profession test to take. The self-assessment uses 20-40 captioned images for each profession, which illustrate selected, typical action situations and are each presented with the question: "How often have you done this?".

Source: Beterlsman Stiftung (2022[111]), Overview of profession for estimating vocational skills (Übersicht der berufe), https://meine-berufserfahrung.de/index.php?&lang=en.

Providing tailored information and guidance

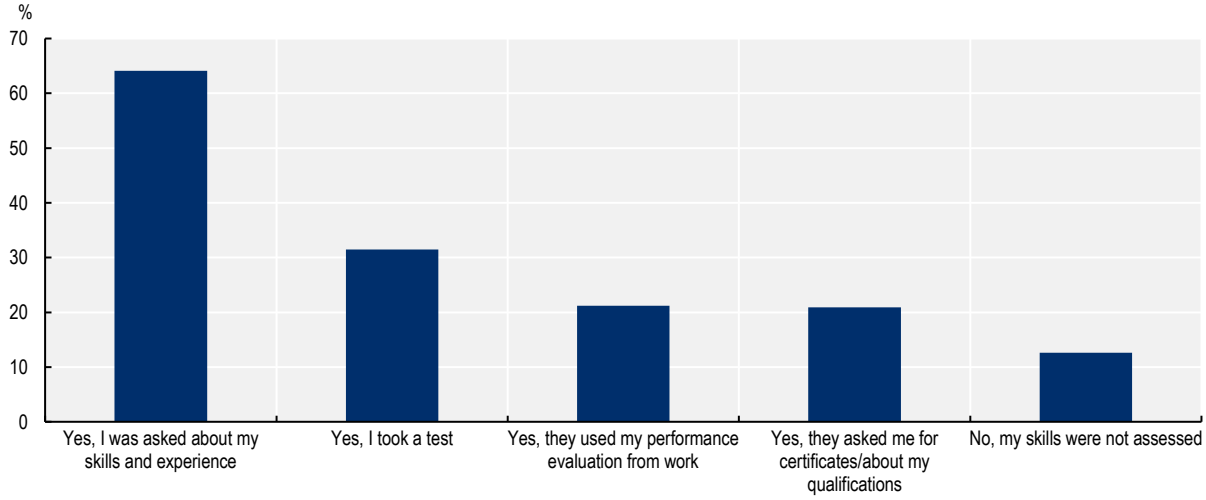
People are generally more sensitive to information when it is customised to their context and needs. For adults, in particular, tailored guidance can be desirable for several reasons. First, they have very diverse backgrounds (e.g. in terms of skills and work experience), which calls for an adult-specific profiling approach. Second, adults often face one or more obstacles preventing them from engaging with learning opportunities (see Chapter 3), and these need to be understood in order to provide tailored advice. Evidence suggests that personalised career guidance is positively associated with enrolment in training as long as it includes current labour market information and, at the same time, considers individuals' context (OECD, 2021[44]). Evidence from six OECD countries suggests that adults who received a personalised career development roadmap are 25% more likely to report improved employment prospects (OECD, 2021[44]).

A critical component of tailored career guidance is the assessment of skills, which can be particularly relevant for adults. Skills profiling tools provide a more objective measure of a person's abilities which is crucial to support flexible pathways and redeployment of adults from declining to growing jobs and sectors. Such profiling tools are still uncommon across OECD countries, while interviews are more commonly used (Figure 4.19). Only 31% of adults have participated in a test, while 64% of them have been asked about their skills and experience, and 21% about their qualifications and certificates.

Related to this, the recognition of prior learning (RPL) plays an essential role in career guidance, especially in formal education programmes – like VET programmes. As Chapter 3 describes, RPL can lead to formal certification of skills acquired outside formal training. The process involves demonstrating achievement of competencies, often by preparing a portfolio of relevant work or demonstrating one's ability to carry out tasks in practice. RPL can shorten retraining pathways by giving adults credit for skills they already have, thus accelerating their transition to new jobs or sectors. Career guidance advisors can help adults to navigate RPL processes.

Figure 4.19. Methods for assessing skills

Percentage of adults who spoke to a career guidance advisor over the past five years, by method for assessing skills



Note: Average for the six countries covered by the SCGA: Chile, France, Germany, Italy, New Zealand and the United States. Respondents could choose more than one answer. Data refer to the last time the respondent spoke to a career guidance advisor.
Source: OECD (2021[44]), *Career Guidance for Adults in a Changing World of Work*, https://doi.org/10.1787/9a94bfad-en.

Reinforcing the quality of guidance by investing in the skills and knowledge of career advisers

In many cases, career guidance services for adults are not effectively meeting their goal of positively influencing career and education-related decisions (OECD, 2021[44]). There are several reasons for that, many of which can be traced back to quality challenges. As for career guidance for youth, quality assurance in career guidance is vital – maybe even more so in the space of adult career guidance which is often scattered among a wide variety of providers. Countries have adopted various strategies to make providers' quality more transparent. As described above, the Greek EOPPEP has a register of private guidance providers, and registered providers can receive preferential support from the Ministry of Labour. In France, the private providers of the Conseil en Evolution Professionnelle (CEP) (Box 4.13) were selected by France Compétences following a call for tender based on criteria related to their understanding of the CEP; proposed methods, partnerships, awareness-raising and accessibility measures; quality of the staff; and piloting measures.

One key aspect of quality is the ability of the counsellors to effectively guide and support users. Nonetheless, those providing career counselling are not always adequately trained for these positions, lacking the knowledge and skills to provide effective guidance (OECD, 2021[44]). In other cases, the information needed by advisors to effectively guide the career decision-making process is not available or well systematised. As career guidance for adults makes intensive use of recent information on labour market trends and outcomes and the wide offer of education and training opportunities, the opacity of information can significantly impact the quality of the career guidance provided.

In most countries, career guidance advisor is not a regulated profession (i.e. no certificate, licence, or registration must be attained to use the occupation title). Nevertheless, many define minimum training and qualification requirements or participation in refresher programmes to operate as counsellors. A growing number of countries offer specialised training and continuing professional development in career guidance

to ensure high-quality services. This allows advisors to keep their knowledge about the labour market and education and training landscape up to date. Career advisors must also develop digital skills amid rapid technological developments that have revolutionised career products and services. In Estonia, for example, the Employment Service of Slovenia offers an annual catalogue of internal professional courses and training (in-person or e-learning). A budget is available to refer counsellors to external professional courses, training, conferences, study visits, and seminars. In Japan, refresher training for career consultants in the public employment service is mandatory and ongoing self-development is expected. Under Japan's new national qualification for career counselling, counsellors must renew their certification once every five years with a minimum of 38 hours of training (Box 4.16) (OECD, 2021[112]).

Box 4.16. High-quality career counselling in Japan: Training career counsellors

To promote high-quality career counselling, the Japanese Government introduced a national qualification in career counselling in 2016. Individuals who obtain this qualification need to renew it every five years. The most common way to obtain this qualification is to pass the exam after taking a 150-hour training course that covers topics such as the importance of career consulting, counselling techniques, general job and labour market knowledge, and collaboration with other career counselling networks. By mid-2019, around 44 000 individuals were registered as qualified career counsellors, and the goal is to increase this to 100 000 by 2024.

For their certification to be renewed, guidance counsellors need to participate in at least 30 hours of training to develop skills in counselling techniques, instructional methods for preparing resumes, techniques for helping people understand their job, techniques for helping people develop themselves, and techniques for helping people adjust to their new job. Additionally, they need to participate in at least eight hours of training to improve their knowledge in one or more of the following areas: vocational development, human resource management, labour markets, labour-related laws and regulations, social security system, education system, and mental health. The Ministry of Health, Labour and Welfare determines eligible training programmes.

Source: OECD (2021[112]), *Creating Responsive Adult Learning Opportunities in Japan*, https://doi.org/10.1787/cfe1ccd2-en.

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Notes

[1] This section draws heavily on Stronati (2023[2]).

[2] The amount of general education included in training packages attracted some criticism in the past, as it was judged insufficient (Knight and Karmel, 2011[113]). In March 2013 the Foundation Skills Training Package (FSK TP) was released, supporting the integrated delivery of foundation skills and vocational skills and knowledge.

[3] Among countries reporting career expectations in 2000 and 2018 PISA, on average 53% of girls and 47% of boys expected a career in one of the ten most cited occupations in 2018.

5 Innovation in vocational education and training

This chapter looks at the use of digital technologies in vocational education and training (VET) and associated pedagogical approaches. The chapter first discusses the use of technologies in VET and their potential benefits. It then describes policies and practices that promote successful implementation of technologies in VET. Finally, it provides an overview of appropriate pedagogical approaches to make the most of technology in VET teaching and learning.

Introduction

The relevance of technology in VET

Digital technologies revolutionised workplace practices by allowing tasks performed repetitively to be automated.[1] At a comparable cost, machines and computers can successfully complete more routine tasks than human beings - leading over time to replacement of labour by machines in jobs with a high share of repetitive tasks. Jobs which typically involved many repetitive tasks and have largely been automated include for example bank teller, switchboard operator and assembly line operator. In education and training the scope for automation is more limited as the core task of teaching at the current state of knowledge cannot by easily divided into replicated sequences. Student populations are highly heterogenous and teachers have to adapt their teaching approaches to students' needs. Out of 38 occupations (based on 2-digit ISCO-08) the teaching profession is estimated to have the lowest risk of automation, as it involves a high degree of social interaction, creativity, problem-solving and caring for others (Nedelkoska and Quintini, 2018[1]). However, digital technologies can complement and make the work of teachers more effective and beneficial to students, since technologies applied to teaching and training change the way in which knowledge is transmitted and skills are developed. For example, technologies can adjust the paste of learning to individual students' needs. Some aspects of education and training not directly related to teaching, such as management and administration, examinations and assessment, and data collection, are more appropriate for automation and in these areas introduction of technologies can generate efficiency gains (OECD, 2021[2]).

Many technologies used in VET are not unique to the VET sector and are also used in other parts of the education system. For example, software that helps to manage a school system can be applied in any school independently of the type of programmes provided. Similarly, tools or programmes assisting students with development of mathematical skills could help all students regardless of the programme they follow. However, some technologies used in VET are unique to VET, reflecting the fact that VET sits at the intersection of the world of education and work and involves more practice-oriented learning. They may refer to the following:

- Non-VET specific technologies that are adjusted to suit VET needs. For example, data analytics may be applied to monitor students' academic performance but also changing skill requirements in the labour market and labour market performance of VET graduates to match the provision of VET programmes to labour market requirements.
- Digital solutions that help students develop vocational skills, e.g. simulators on which VET students can safely learn how to operate tools, machinery or vehicles.
- Technologies that are applied in the occupations that students are preparing for, as students should master these technologies to be able to enter working life after completing their education and training. For example, a car mechanic should be familiar with specialised equipment to work on electric-car batteries as compared to traditional low-voltage auto electronics. In this case, technology refers to technologies applied in jobs and the digital skills necessary to use these technologies, rather than tools supporting the learning process.

The frontier between the three categories is often not clear cut, as the use of digital tools supporting learning can also lead to the development of digital skills that are required in workplaces. For example, a simulator imitating work situations is used for training and at the same time develop work-related skills. Recognising this overlap, this section focuses on the first two types of technology, which are understood as digital tools and devices proper to VET and facilitating its provision. It also looks at technologies that are applicable to the whole education system without being VET specific, such as digital school management system. However, it does not discuss the issue of how well VET programmes match the technological requirements from employers.

In recent years, the education technology (EdTech) market has grown, and many EdTech companies have started producing applications tailored to the needs of vocational teachers, trainers and learners, including apprenticeship management systems, simulators, and virtual reality (VR) and augmented reality (AR). Estimates suggest that between 2019 and 2025, the global investment in education technologies will grow on average by 16.3% each year, multiplying by 2.5 in a 6-year period (HolonIQ, 2019[3]). A lot of the recent growth in EdTech was driven by investment in online learning tools and platforms – in particular during the COVID-19 pandemic-, but investment in advanced technologies in the education industry, such as VR and AR, is likely to expand in the coming years, with projections showing that this market is expected to grow sevenfold between 2018 and 2025 (HolonIQ, 2019[3]). VET teachers, trainers and industry experts can be involved in the design of new applications, to develop materials that are relevant and easy to use in vocational training (OECD, 2021[4]). Several countries encourage such collaborations by establishing formal partnerships between the VET sector, industry, EdTech companies and research and development institutions to foster innovation and the use of technology in VET.

The COVID-19 pandemic demonstrated that digital tools, such as online learning, can be usefully applied to deliver education and training to students. During the pandemic, VET providers made ample use of distance-learning solutions, as did schools in general education. All OECD countries made use of online platforms in upper-secondary VET in 2020 and/or 2021, and between 70% and 80% of countries used take-home packages, television and mobile phones for teaching and learning during the pandemic. At the same time the rapidly growing reliance on technologies in education and training revealed its limitations and pointed to challenges when these solutions are applied on a massive scale. Lack of skills required for the successful use of technologies among teachers and students and unequal access to technology contributed to variation in the use of technologies and their outcomes. The experience during the pandemic also showed that while these solutions can work effectively for the theoretical or academic components of VET, online provision is often less suited for more practice-oriented components. To address this issue many countries applied hybrid models in VET, offering in-person classes for practice-oriented components of the curricula and remote education for the remaining parts.

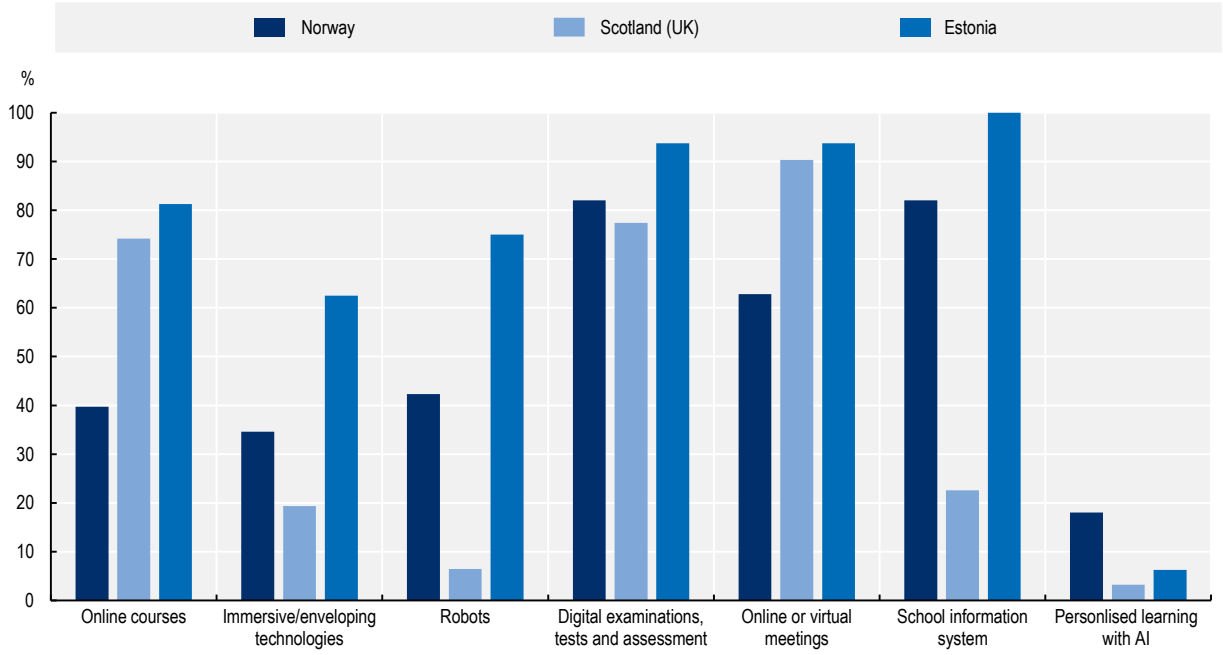
The intensity of technology use in VET

Information on the use of different technologies in VET is scarce. To shed more light on these issues the OECD piloted a survey on the use of technology in VET institutions in selected countries: Estonia, Norway and Scotland (United Kingdom) (Box 5.1). The survey aims to produce new insights on the use of different types of technologies in VET and to identify factors that enable their successful introduction.

The results show that the use of technologies in VET institutions varies across countries, reflecting differences in the structure of VET systems and in polices targeting the use of technologies in VET. Respondents in Estonia are most likely to use digital technologies, while respondents from Scotland (UK) are least likely (Figure 5.1). As described in Box 5.1, results from Scotland need to be interpreted with caution. Digital examinations, tests and assessment, and online or virtual meetings are among the most used technologies across all three countries. School information systems are very common in Norway and Estonia, but not so much in Scotland. The use of robots and simulators also seems more widespread in Norway and Estonia than in Scotland. On the other hand, online courses are common in Estonia and Scotland, but less so in Norway - which may be related to the lower share of the VET institutions catering to adult learners in Norway than in the two other countries. Personalised learning with AI does not seem widespread in any of the three countries.

Figure 5.1. Use of technologies in VET institutions in Estonia, Norway and Scotland (United Kingdom)

Share of respondents reporting using the specific technology



Note: Number of observations by country: Norway – 77 responses from 51 VET institutions, Scotland (UK) – 31 responses from 29 VET institutions, Estonia – 16 responses from 15 VET institutions. Results need to be interpreted with caution due to small sample sizes.
Source: OECD Survey on the use technologies in VET.

Box 5.1. OECD Survey on the use of technologies in VET

The OECD survey on digital technologies in vocational education and training (VET) was sent to institutions providing upper secondary VET programmes in Norway and Estonia, and upper secondary and post-secondary VET programmes in Scotland (Scottish qualifications level 5-9). The data were collected between May and September 2022. In Estonia and Norway, the survey was mainly answered by teachers and headmasters. In Scotland, respondents also included a range of other professionals involved in the provision of VET, such as exam coordinators, managers, CEOs, vocational qualification assessors.

77 answers from 51 VET institutions were received from Norway (out of 315 VET schools); and 16 answers representing 15 VET schools in Estonia (out of 31 VET schools). For Scotland, 31 answers representing 29 VET providers were received, representing only a very small fraction of the more than a thousand VET providers. Scottish results are therefore excluded for most of the analysis in this chapter due to the low response rate.

For simplicity, the Survey divided technologies into seven categories:

- Online course is a form of education carried out through a connection to the internet. With an online course, a teacher may deliver training in a range of formats, using tools like live video streaming, recorded videos, eBooks and webinars. Online courses are usually accessible to a wide range of students, regardless of their location. Some are available for free, whereas others have a price tag.
- Immersive/enveloping technologies include technologies such as 3D videos; virtual, augmented and mixed reality (through computers and simulations the person interacts with an artificial 3D visual and sensory environment, real world elements are enriched and mixed with digital elements); and games and gamification (taking elements from game-design, the general principles and theories which drive gameplay, and applying them to other nongame contexts).
- Robots and simulators can assist with a wide range of teaching and learning tasks. Simulators allow students to develop their ability to confront real-life challenging scenarios. For example, vocational teachers use welding robots to introduce students to automatic welding. They show how welding robotic arms can be programmed using specialised software. In the logistics and transportation sector for example, learners use simulators to learn how to drive a truck or operate a loader vehicle facing real-life issues.
- Personalised learning with artificial intelligence (AI): AI can give teachers a sense of how different students learn and how they advance in learning. It can help them read the classroom better, adjust the speed of teaching, and stimulate students with different techniques such as pop quiz questions. For example, AI can also help integrating real-time data and feedback in assessment and identify students at risk of dropping out or those who may benefit from accelerated learning.
- Digital examinations, tests and assessments refer to assessments, tests, surveys, and other measures that are delivered via digital devices such as computers, tablets, and mobile phones. They may lead to the delivery of digital credentials/qualifications.
- Online or virtual meetings are a form of communication that enables people in different physical locations to use their mobile or internet connected devices to meet in the same virtual room. Online meetings may be used by VET teachers, learners, parents, employers and other actors to exchange information.
- School Information System (SIS) is a web-based platform that helps schools take student and teacher data online for easier management and better clarity. The SIS is able to collect school-wide data online (e.g. student information, grades, records of tests, attendance, appraisal performance, teacher absence) that can be easily accessed by teachers, parents, students, and administrators. SIS can also facilitate teacher collaboration and support teachers in their teaching tasks. For example, teachers can share and use lessons and teaching material that are stored in a centralised location in a database or on a serve.

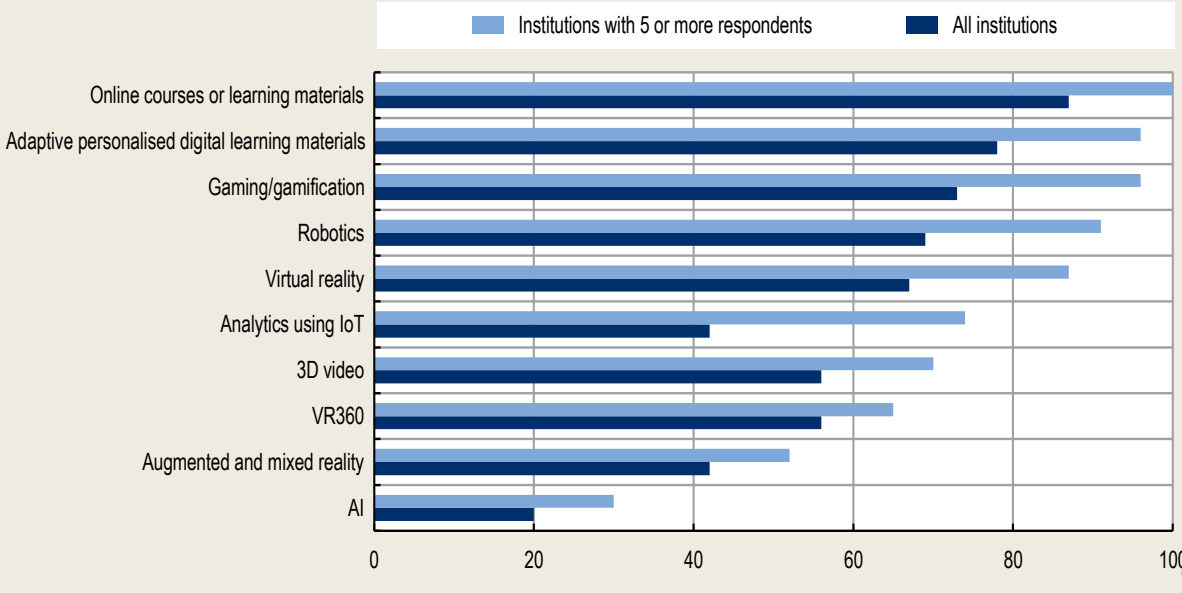
A similar survey on the use of technologies in VET institutions was carried out in the Netherlands. While the results are not fully comparable to the outcomes of the OECD survey because of methodological differences, they provide information on the intensity and type of technologies used by the Dutch VET institutions (Box 5.2). They point to an extensive use of technologies in VET, including virtual reality, gamifications and robotics, although the results also show that some of these more specialised digital technologies are used only in a limited subset of VET programmes.

Box 5.2. Findings from the 2019 Dutch survey of digital technologies in VET

In the Netherlands, the use of digital tools and innovative technologies for teaching is widespread among VET institutions according to a 2019 survey of teachers, leaders and other staff from Dutch VET institutions. The survey found that the most commonly used digital tools are online courses or learning materials. Other commonly used tools and technologies include gamification, adaptive personalised digital learning materials, robotics and virtual reality. In contrast, few institutions are using AI. The survey also found that not all of those tools and technologies are used widely within the programmes provided by the institution. For example, gamification and VR are generally only used in a few programmes or by a few teachers, whereas online courses or learning materials, and adaptive personalised digital learning materials are used in around half of the programmes.

Figure 5.2. Use of technologies in VET in the Netherlands

Share of institutions reporting using a specific technology

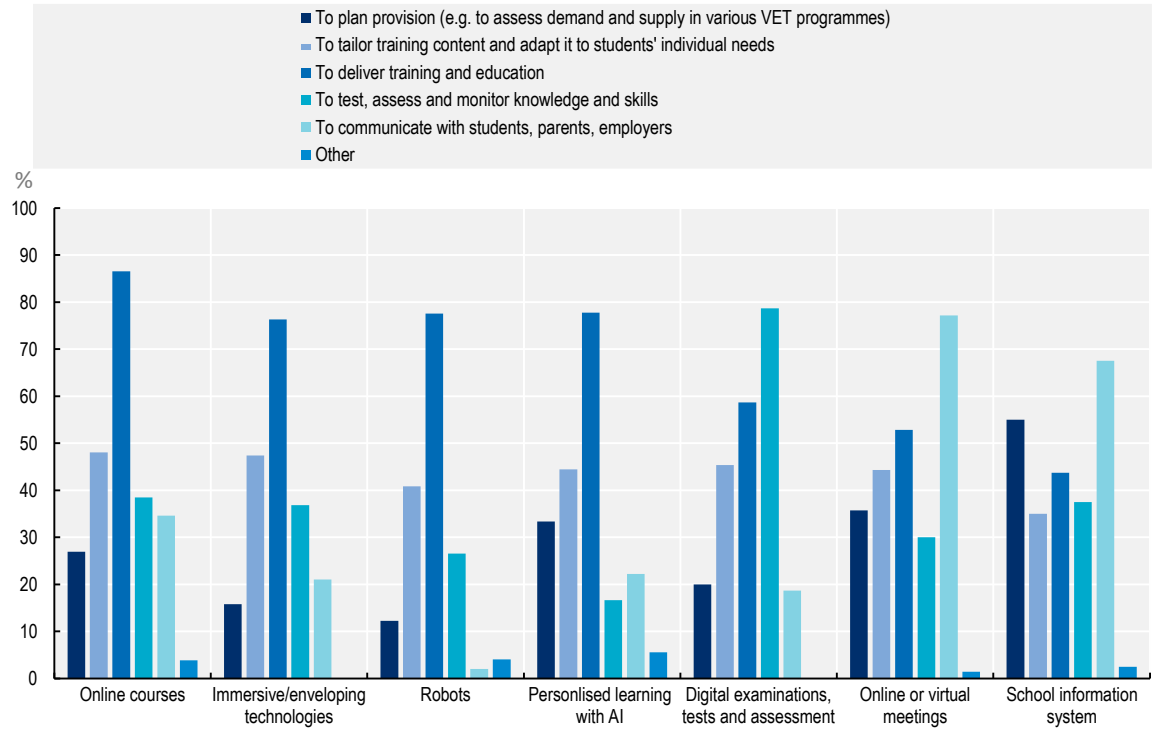


Note: All institutions" refers to the 53 participating VET institutions (i.e. 83% of all Dutch VET institutions). Restricting the sample to those institutions that have at least 5 respondents in the survey reduces the number of institutions covered to 23. VR refers to virtual reality, AI to artificial intelligence, IoT to Internet of things. The survey covers additional technologies not included in this figure, see ECBO (2019[5]).
Source: ECBO (2019[5]) Onderwijsinnovaties met moderne ICT in het mbo, https://ecbo.nl/wp-content/uploads/sites/3/RapportOnderwijsinnovaties-met-moderne-ICT.pdf.

The survey results for Estonia and Norway show that technologies serve different purposes and are used in different settings. Digital solutions such as online courses, immersive learning, robotics and simulators, and personalised learning are mainly used to deliver education and training to students (Figure 5.3). School information systems and online meetings are important for communication with students, parents and other stakeholders involved in VET. At the same time, the school information system in Norway and Estonia also plays other roles, such as helping with planning the provision and with the delivery of education and training.

Figure 5.3. The different purposes of technology use in VET institutions in Norway and Estonia

Share of respondents in Norway and Estonia using a specific technology by its purpose

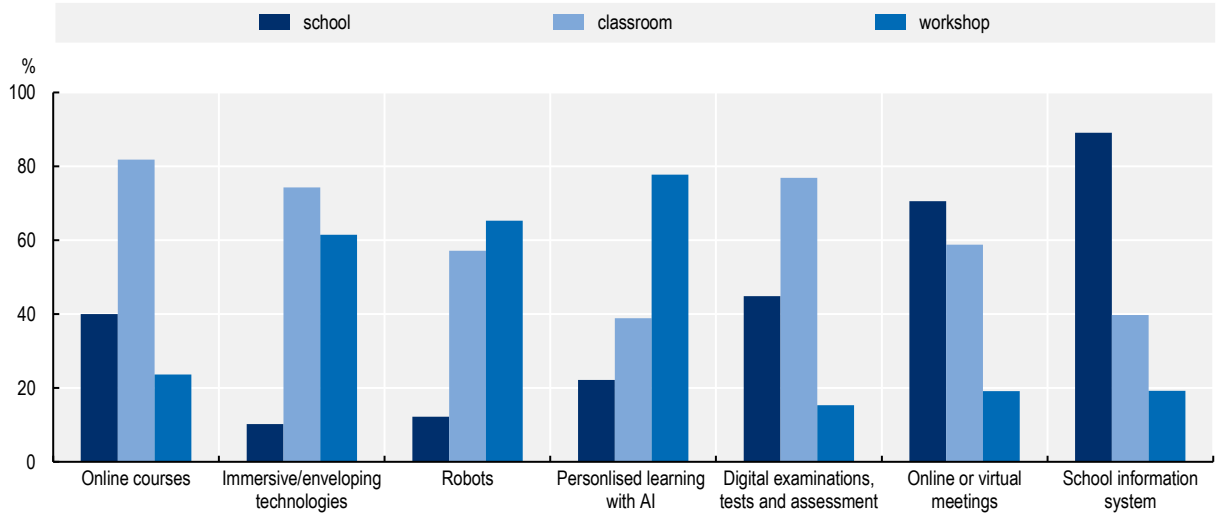


Note: The number of responses by technologies reflects to the number of respondents who use the specific technology: 52 respondents provided answer regarding online courses, 38 on immersive technologies, 49 on robotics and simulators, 18 on personalised tools, 75 on digital examination, 70 on online meetings and 80 on school information. How to read the chart: 68% of respondents using school information system use it to communicate with students, parents and employers, 55% to plan the provision, 44% to deliver education and training, and around one in three uses it in assessment and to tailor training content to individual needs. One technology can be used for more than one purpose.
Results need to be interpreted with caution due to small sample sizes.
Source: OECD Survey on the use technologies in VET.

Depending on their purpose, technologies are applied in different settings Figure 5.4. Survey results for Estonia and Norway show that technologies such as school information system and online or virtual meetings are used at the school level. These technologies facilitate school management and services, meaning that they are relevant to all students and available to all teachers and (some) other staff categories. However, school information systems and online meetings are not purely limited to school matters as they can also be applied in classrooms and workshops. In the two countries, more advanced technologies such as robotics and simulators and to some extent immersive learning with AI are less widespread than other digital tools. Interestingly, when these technologies are applied, they are often used for student training delivered in workshops. These technologies may thus have a particular relevance to VET. The Norwegian results show that teachers of mechanics, IT, industry technology and electronics are the most likely to report the use of robotics and simulators (i.e. the robots category in the survey). Some VET programmes may therefore particularly benefit from the use of these digital solutions. For example, they can be helpful in areas where expensive equipment is required and when errors are costly and may put students' safety at risk.

Figure 5.4. Settings where digital technologies are used in VET institutions, in Estonia and Norway

Share of respondents using technologies, by setting of use and type of technology



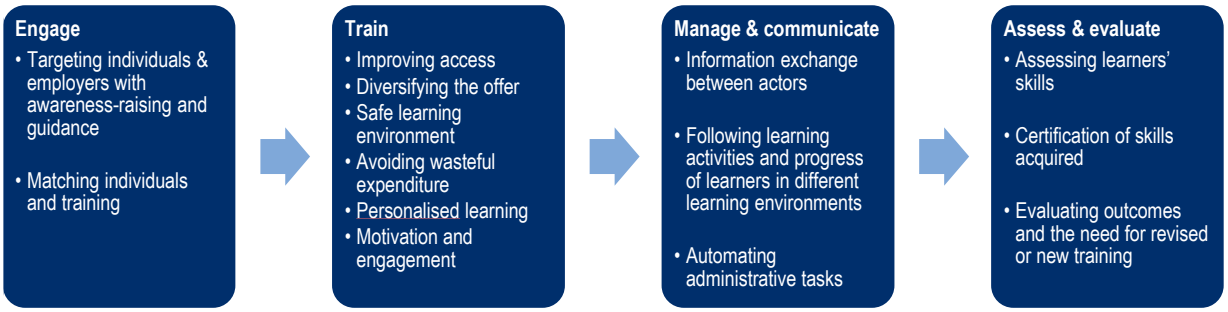
Note: 82% of respondents use online courses in the classroom, 40% apply it to activities relevant to the whole institution and 40% use online courses in the workshop. One technology can be used in more than one setting. The number of responses by technologies reflects to the number of respondents who use the specific technology: 52 respondents provided answer regarding online courses, 38 on immersive technologies, 49 on robotics and simulators, 18 on personalised tools, 75 on digital examination, 70 on online meetings and 80 on school information. Results need to be interpreted with caution due to small sample sizes.
Source: OECD Survey on the use of technologies in VET.

This chapter first discusses potential benefits arising from the use of technologies in VET bearing in mind that digital technologies in VET are still a relatively new and growing phenomenon. While there are many potential benefits that could be associated with their more systematic use, more research is required to fully evaluate the impact of technologies on students' outcomes. It then discusses policies that promote successful implementation of technologies in VET. Finally, it provides an overview of innovative pedagogical approaches in VET.

What are the potential benefits of digital technologies in VET?

Introduction of technologies in VET can potentially lead to many benefits (Figure 5.5) for an overview of potential areas of use). Technology can be integrated in various aspects of VET provision and contribute to making the system more accessible, attractive, relevant, transparent, effective and efficient. The different aspects in which technology is used can be broadly classified as: engage, train, manage and communicate, and assess and evaluate. Technology can be used by the schools/training providers (teachers and leaders) and the employers that provide work-based learning, but also at the higher-level to influence the overall VET system.

Figure 5.5. Potential types of technology use in VET



How to use technology to engage VET actors?

With more detailed data collection and analytics on students and VET graduates, as well as VET institutions (schools) and employers, profiling models could be used to identify individuals who could benefit from VET programmes, including early school leavers and job seekers. Likewise, on the employer side, data on employees' skills and employers' training systems can show which enterprises could benefit from offering training and/or need support to engage in training provision.

Moreover, technology can be used to better match learners, institutions and employers. Technology can help connect them, by profiling individuals' skills and aspirations, employers' skill needs, and VET institution offers, and finding the best matches between them. This can help reduce searching and matching costs and increase the effectiveness of matching skill needs and training. Innovative profiling and matching models are likely to become more prominent as big data become widely available. Flanders (Belgium), for example, uses a deep learning model based on real-time labour market data and job seekers' skills data to support people in taking up vocational training or finding jobs (Box 5.3). Scotland (UK) has set up a comprehensive online apprenticeship portal called *apprenticeships.scot*. Among its many functions, the portal offers services to connect apprentices and employers, and provides information on apprenticeship jobs and funding opportunities, and general guidance and advice on apprenticeships. It complements other online guidance portals, as described in Chapter 4. In Norway, a new online portal for apprenticeships was launched in 2023 (www.finnlarebedrift.no). The portal gives an overview of approved apprenticeship enterprises and available apprenticeships by region and training field. The portal builds on daily updated data from different public registers. The portal is part of the national online portal for information about education and occupation in Norway (www.utdanning.no).

Box 5.3. Flanders (Belgium): Using AI to better match learners and training opportunities

The Flemish Employment and Vocational Training Service (VDAB) helps residents of Flanders find jobs and take vocational training, by using machine learning (ML). VDAB recently partnered with Radix.ai, a Belgian ML start-up, to make the matching process more effective and efficient. This initiative uses the VDAB data contained in CVs and job postings and applies ML to provide better-targeted matches for VDAB users. Deep learning, a subset of ML, enables machines to mimic human behaviour, and in order to train the deep learning model, VDAB regularly uploads new vacancies and CVs to their storage engine. With each new dataset, the engine learns how the job market evolves, noting changes in job demand and how trends shift over time.

The deep learning model also learns how jobs are spoken of and what the changing interplay of words means. For example, “data scientist” is a relatively new job, related to the roles of machine learning engineer, data analyst and even AI architect. The model allows machines to learn the meaning of words and continue to improve matching quality. Based on word relationships and the interests and behaviour of the users, job matches are more closely aligned to the aptitudes, talents and preferences of job seekers.

Source: Amazon Web Services (2021[6]), AWS Partner Story: VDAB & Radix.ai, https://aws.amazon.com/partners/success/vdab-radix-ai/ , DeTijd (2023[7]), AI-bedrijf Radix helpt VDAB jobs op maat aan te bieden, www.tijd.be/de-tijd-vooruit/tech/ai-bedrijf-radix-helpt-vdab-jobs-op-maat-aan-te-bieden/10313389.html.

How can technology facilitate teaching, training and learning in VET?

Technology can help increase the accessibility of VET programmes. Online and virtual learning can improve access for learners in remote areas by providing remote connections to VET institutions and employers – as long as internet connectivity is up to standard. Other types of technology can also make VET more accessible to students with special needs that may have prevented them from following certain pathways in the past. For example, artificial intelligence (AI) systems can help students overcome obstacles, such as through text-to-speech or speech-to-text applications or wearables to help visually impaired students read books (OECD, 2021[2]). With well-known applications such as speech-to-text, text-to-speech, and auto-captioning, etc., AI allows blind, visually impaired, deaf and hard-of-hearing students to participate in traditional educational settings and practices. Some smart technologies facilitate the diagnosis and remediation of some special needs (e.g. dysgraphia) and support the socio-emotional learning of students with autism so they can more easily participate in mainstream education (OECD, 2021[2]).

Technology can also increase the flexibility of provision. This may be particularly important for adults who combine work and learning. In Canada, for example, the Flexibility and Innovation in Apprenticeship Technical Training (FIATT) project experimented with alternative delivery approaches such as a combination of online learning with classroom learning, mobile training units, instructor support or simulators. FIATT apprentices were more likely to agree their training was flexible. They missed fewer hours of work and reported fewer lost earnings (Government of Canada, 2022[8]). In the United States (city of Dallas) high school students can carry out paid virtual internships. Typical virtual internship lasts 120 hours spread over 4 weeks in the summer, though semester-length internships can also be arranged. Students also have on option of carrying out hybrid internships, whereby they alternate work in the company and work from home. During their internships students take on short-term projects that address challenges of the company. A toolkit developed by the city of Dallas provides practical advice to employers who wish to offer virtual or hybrid internships (Dallas ISD’s CTE Department, 2021[9]).

More advanced technology can help to diversify training options, by overcoming material shortages that might otherwise limit what governments and learning providers can offer to students and how students can progress. For example, virtual or augmented reality (VR/AR) and simulators, can enable students to develop vocational skills by performing specific tasks like operating heavy machinery, learning how to repair a car engine, or testing chemical products in a laboratory (OECD, 2021[2]). In such cases, it may be cheaper and safer to use simulators or VR/AR than traditional laboratories that are expensive to set up, maintain and update. VR and simulators could also reduce wasteful expenditures in those occupations that make intensive use of materials or supplies, representing a greener cost-effective alternative. They also show important advantages in terms of economies of scale, allowing for their use in many different institutions. Moreover, the use of VR and AR has numerous benefits for employers providing training, as these technologies can shorten the amount of time that new trainees need to spend on real equipment,

which reduces the cost of training and therefore provides a cost-effective complement to traditional work-based learning.

According to a World Bank study, VR training is more effective on average than traditional training in developing technical, practical and socio-emotional skills; it is particularly promising in fields of health and safety, engineering and technical education. Students who had VR training used inputs and time more efficiently and/or were better at avoiding performance errors than students receiving traditional training. For each additional hour of VR training, students scored 3% higher in technical learning assessments than those exposed to the same content delivered through traditional methods (Angel-Urdinola, Castillo Castro and Hoyos, 2021[10]). However, the World Bank analysis found that the effectiveness of VR training differs across sectors and subjects.

Moreover, the use of digital technologies has been associated with increased student motivation and engagement, leading to higher student retention rates in VET programmes and therefore contributing to equity in education (Khan, Ahmad and Malik, 2017[11]). Unlike training in workplaces, classroom teaching is often more theoretical and can be less appealing to students who dislike classroom settings and academic learning. One of the aims of VET pedagogy is thus to show to VET students that what they learn in the classroom can be directly applied in workplaces. In Switzerland, a dedicated 'Leading House' has been set up to research technologies for vocational training. Leading Houses contribute to the sustainable development of VET research in Switzerland and are coordinated by one or more Swiss university chairs. Each Leading House serves as a competence network and conducts research under the terms of a service level agreement with The Swiss State Secretariat for Education, Research and Innovation (SERI) (SERI, n.d.[12]). The Leading House dedicated to the topic of technologies for vocational training (i.e. the DUAL-T Leading House) has as purpose to determine how learning activities may be designed so as to close the gap between classroom instruction at VET schools and work-based training at host companies. The Leading House also seeks to optimise coordination between various VET learning locations (SERI, n.d.[13]). For example, in logistics programmes, the Leading House developed an intervention that consists of using a small-scale model of a warehouse in the classroom as a basis for problem-solving exercises close to workplace practice. By using technologies students and their teachers can run simulations on top of their warehouse layouts (EPFL, 2022[14]).

Another potential benefit of technology is that it can be used to provide personalised support to learners and teachers. Personalisation of learning did not start with computerised technology – in a sense, it has been available since the first use of one-on-one tutoring, thousands of years ago (if not earlier). However, with the increase in systematised, standardised schooling and teaching over a hundred years ago, awareness increased that many students' learning needs were being poorly met by one-size-fits-all curriculum. Classroom approaches such as mastery learning (each student works on material until mastery and only then moves on to the next topic) were developed but proved difficult to scale due to the demands on the teacher. Educational technologies provided a ready solution to this problem – the computer could manage some of the demands of personalising learning, identifying each individual student's degree of mastery and providing them with learning activities relevant to their current position within the curriculum (OECD, 2021[2]). Over time educational technologies became more effective at personalised learning. Modern educational technologies in many cases could recognise when students are using ineffective or inefficient strategies, and to provide them recommendations or nudges to get back onto a more effective trajectory (OECD, 2021[2]). Currently, researchers aim to adjust the learning process not only to students' ability but also to their engagement, motivation and emotion. There are now several examples of educational technologies – particularly intelligent tutoring systems and games – which have been able to identify a student who is bored, frustrated, or gaming the system (trying to find strategies to complete materials without needing to learn) and re-engage them productively (OECD, 2021[2]).

Learner tracking systems, where teachers and trainers have detailed information on learners, can improve the quality of training provision, similar to the player-level analytics available to a professional sports coaching staff. Such systems can provide teachers and trainers with information that they may have

neglected during lessons due to their workload or other systemic, technical, or institutional issues. Data analytics and statistical profiling models can be used to identify students at risk of dropping out, using the administrative micro-data that are increasingly being collected by education systems and organisations. While identifying a good set of early warning indicators remains difficult, a few systems have shown a high level of accuracy and enriched thinking about the reasons students drop out (OECD, 2021[2]). These techniques may help prevent students dropping out, detect potential problems, and provide opportunities to intervene earlier. For example, in the United Kingdom, predictive analytics tools can be used to identify high-risk programmes and learners by measuring trends in learner engagement and motivation (OECD, 2021[2]). In Switzerland, the DUAL-T Leading House that examines the use of technologies in VET, developed tools to help students to succeed, explore behavioural patterns and predict students' performance. For pre-class activities, this design often makes use of videos and digital content published in online platforms. The students' engagement in pre-class activities prepares students for effective participation in face-to-face sessions. While the pre-class scheme was developed primarily to increases students' success rates during classroom teaching it also contributed to development of a model predicting students' performance. The model draws on digital traces left by students during their online interactions with pre-class activities. The widespread use of the scheme allowed researchers to investigate these interactions and, on this basis, predict students' performance. These early predictions enable effective content personalisation and adaptive teaching interventions (EPFL, 2022[15]). Technology can thus help to personalise learning and adapt its speed and content to individual needs. This may be particularly important in VET, as in many countries VET programmes cater to students with lower academic performance facing a higher risk of dropping out from school.

How can technology help to better manage and communicate in VET?

Technology can be used to reduce administrative and repetitive tasks involved in VET management, such as managing admissions and school allocations, assessment reports, proctoring systems, and resource allocation and planning (OECD, 2021[2]). Initially, schools used technology to facilitate office and clerical tasks, mainly to store student and personnel data. Over time, the use of technology in educational management expanded. Computers now assist institutions not only in storage but also in manipulation and production of data and information. These processes related to the use of technologies in school management are sometimes referred to as School Information Systems (Visscher, 2001[16]). School information Systems serve different purposes. They support the registration of data, facilitate access of students to web resources by creating one entry point, support school management by providing relevant information such as information on student progress, teacher absence and teacher training. Evaluations of School Information Systems show that they can improve access to information and school resources and result in a more efficient administration. They may also contribute to a lower workload among school staff who use ICT technology with confidence (Shah, 2014[17]).

Estonia provides an example of how School Information System contributes to the production of data and how this information then feeds back to schools to support their management and learning practices (Box 5.4). The Estonian government has cooperated with the private sector to deliver several educational programmes and provide educational institutions ICT services to support learning and teaching. Currently, 95% of schools in Estonia use one of the two major school management tools: eKool or Stuudium (e-Estonia, 2023[18]).

Box 5.4. Education Information System in Estonia

Since 2004, Estonia has been managing data on students, schools, study materials, examinations, curricula and teaching staff through the Estonian Education Information System (EHIS), managed by the Ministry of Education and Research. Schools are required to enter the relevant data, such as on students' grades and successfully completed certificates, directly into the system. The Estonian Education Information System is a personal-identity-based database, which means that each person is registered with an individual identification number and the data from different sources are connected. Schools can access their school-specific data to monitor their performance and to integrate this information into their management and learning approaches. Aggregated EHIS data are available to the public on an online platform called Educational Eye (*HaridusSilm* in Estonian) and can be used for example to guide students in their educational choices.

Source: OECD (2020[19]), Strengthening the Governance of Skills Systems: Lessons from Six OECD Countries, https://doi.org/10.1787/3a4bb6ea-en.

School Information systems may also store information on student's progress and more broadly on individuals' credentials and education and training milestones. Mobile logbooks allow students to record and demonstrate their learning and training progress, including details such as hours worked, tasks performed, and equipment used. Collection and production of data is not limited to VET schools only. In apprenticeships, information systems can be developed and used by employers and employer organisations working with apprentices, as in Norway (Box 5.5). This can facilitate the communication between the learning venues and allow for a better monitoring of learning activities and progress.

Box 5.5. Information system in apprenticeship: Norway OLKWEB - an e-platform

In Norway, apprentices are able to complete their training requirements, provide documents and access government assistance through specialised e-platforms. One popular system known as OLKWEB has been optimised for use by training offices (employer organisation assisting individual employers with the provision of apprenticeship training), who are able to follow up on their apprentices and generate reports that document the apprentice's activities and outputs. Learning providers are able to perform several key functions, including:

- Access the contacts and details of member companies
- Analyse and monitor the apprentice's progress through curriculum goals provided through traditional means or by films, images and mobile apps
- Access details of grants and general accounting.

Apprentices are also able to interact with each other through the system and can use the interface to record meetings and receive information. The employer is also able to monitor the apprentice's progress in off-the-job training. In the extremely rural area of Nordland, the customised apprentice interface allows apprentices to fulfil their training requirements without travelling vast distances. E-platforms also remove administrative burdens and allows young people to complete their apprenticeship requirements flexibly.

Source: OECD (2022[20]), *Strengthening Apprenticeship in Scotland, United Kingdom*, https://doi.org/10.1787/2db395dd-en.

How can technology be used to assess VET students' skills and evaluate VET outcomes?

Technology creates innovative, cost-effective, and predictable ways to assess and certify skills and collect the necessary evidence. Digital and smart technology is increasingly being used in the assessment of education and training outcomes, including in apprenticeships, and in compiling e-portfolios of skills. Online exam tools or online assessment platforms can reduce the work of assessors by creating exam questions to test competence-oriented tasks and compile them into an overall exam. Smart technologies and smart data analysis techniques enable assessments to be broadened to take in skills that cannot be easily measured by conventional tests. For example, game-based tests can measure higher-order skills (e.g. creativity) or emotional and behavioural skills (e.g. collaboration, behavioural strategy), and analyse eye-tracking data and audio recordings, and process natural language and information such as time-on-task (OECD, 2021[2]).

Blockchain technology can open new avenues for credentialing in VET as a form of "verification infrastructure". It enables claims about an individual or institution, including their characteristics and qualifications, to be verified instantly and with a very high level of certainty. This helps eliminate diploma and other record fraud; facilitates the movement of learners and workers between training institutions, workplaces and jurisdictions; and empowers individuals by giving them increased control over their own data. Many blockchain initiatives are underway across the world, which may transform how VET and apprenticeship systems – as well as entire skills systems – manage degrees and qualifications (OECD, 2021[2]).

However, caution is needed when expanding these kinds of innovative approaches in assessment and certification. Close collaboration between employers, teachers, trainers and assessors – as well as strategic support from government – is a fundamental step prior to making any decision about implementing technology solutions for assessment. It is important to be transparent about how accurate technological systems are at measuring or assessing competencies as compared to other methods, and to ensure that those using these tools have the knowledge and skills required to use it.

Moreover, technology can improve the monitoring of quality and outcomes in the VET system, by providing more accurate, timely and detailed information on the labour market outcomes of learners and employers' skill needs. Monitoring can be more rigorously and effectively conducted using advanced analytical approaches and technologies that facilitate data collection and analysis. Big data provides many opportunities and these data are increasingly being used, but also need to be used with caution (see Chapter 2). Nowadays, most job vacancies are being posted online in developed countries, replacing traditional hiring methods such as ads in newspapers (Cedefop, 2018[21]). This migration, combined with a growth in computer processing power has provided new opportunities for collecting and analysing large, naturally occurring online job vacancy datasets. Consequently, evidence on employers' demands for skills has been growing over time. The volume and the level of detail in online job vacancy data allow for a granular analysis of employer's demand, across firms, within a specific occupation, and by region. When combined with more traditional data sources such a Labour Force Surveys these data represent a powerful tool to examine changing demand for skills on the labour market. This information can help to (re-)define the offer and content of VET programmes. The models can use the data to improve their predictive power and target results more precisely, ideally in conjunction with a continuous dialogue between data analysts, policy makers and practitioners. This can help reduce searching and matching costs and increase the effectiveness of matching skill needs and training.

How can digital technologies be used more effectively in VET?

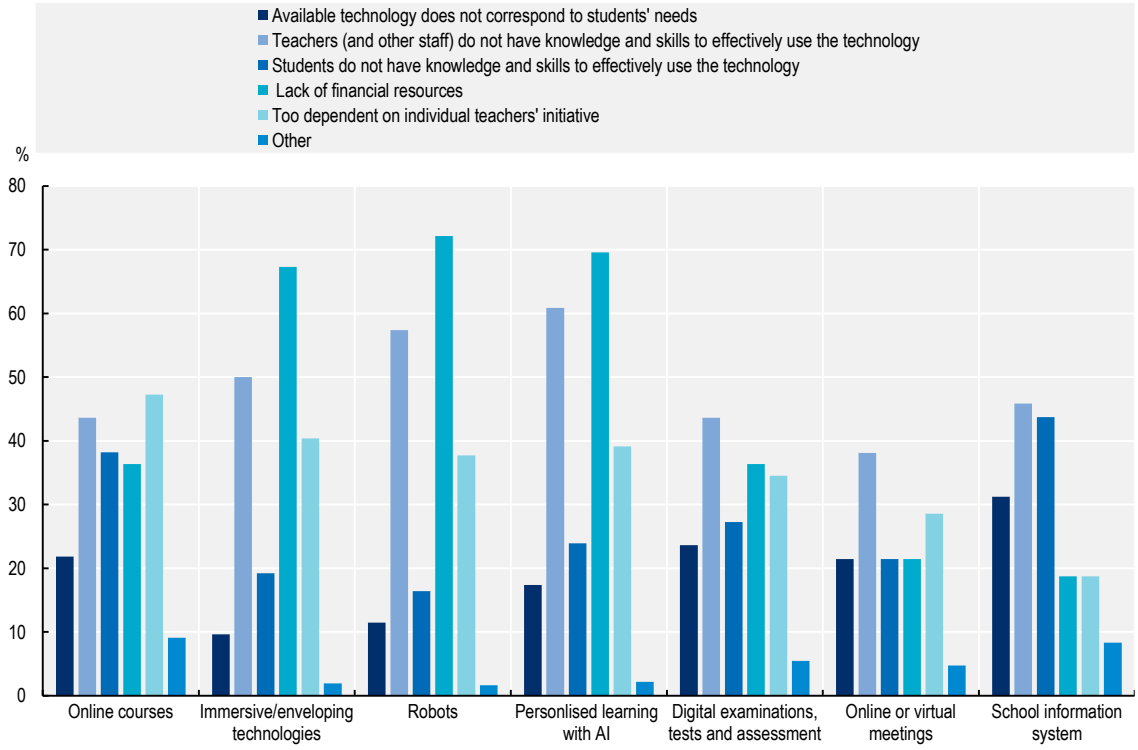
The OECD Survey on the use of technologies in VET (Box 5.1) in Estonia and Norway highlighted that the majority of respondents are most of the time satisfied with the identified technologies. 90% or more of respondents strongly or somewhat agreed that the technologies such as online courses, online or virtual meetings, robots, school information system and immersive/enveloping technologies were successful in meeting its objectives. Using the same measure, around 80% of the participants rated positively digital examinations, tests and assessments and personalised learning with AI.

Nonetheless, various barriers hinder the adoption and effective use of technology in VET. The cost of the purchase and maintenance of technologies, insufficient information about available digital tools, and lack of digital skills among teachers and other stakeholders involved in VET delivery are some of the barriers to a more effective use of digital tools by VET institutions. When reflecting on factors that prevent technologies from being adopted and used more effectively, the survey respondents in Estonia and Norway point to a high cost of some advanced digital solutions supporting delivery of training and education, such as robotics and simulators, immersive solutions and personalised learning and AI (Figure 5.6). Another commonly reported obstacle is teachers not having the right knowledge and skill. A relatively large share of respondents also note that the use of a certain technology is too dependent on individual teachers' initiative, potentially pointing to a need for more institutional guidance and support. The survey on technology use in VET institutions in the Netherland identified similar obstacles (ECBO, 2019[5]): The main barriers to the use of innovative technology in Dutch VET institutions were teachers' lack of ICT skills, time and ownership, and institutions' lack of vision and objectives.

VET institutions and other users of technologies may thus benefit from policies that address the high cost of digital tools, improve knowledge about existing VET technologies, stimulate development of new tools and improvement of existing ones, and help teachers develop the relevant skills. These policy measures are complementary and for those reasons they should be introduced simultaneously. For example, for a new digital tool to be introduced in VET institutions and used by VET teachers it should be evaluated and compared to existing tools; concerned stakeholders should be aware of its existence and its benefits; and teachers may need some training to learn how to use it. Moreover, unless there are specific measures in place, some VET institutions with lower financial capacity may not be able to afford it. Such a holistic approach makes the adoption of technologies more effective: improve the match between digital technologies and teachers and students' needs and prevent users incurring financial losses by investing in ineffective technologies. In Norway, the government launched a "Strategy for digital competence and infrastructure in kindergartens and schools" in 2023. The main purpose of the strategy is to enable schools, their owners and employees to take action on digitalisation, and to receive sufficient support. It should provide a clearer direction for how challenges, including on aspects related to privacy, choice, procurement and use of teaching aids and schools' and teachers' digital competence, can be solved today and in the future in an efficient and sustainable way (Ministry of Education, 2023[22]).

Figure 5.6. Obstacles to technology adoption and use in VET institutions in Estonia and Norway

Share of respondents by reasons preventing them from using a specific technology more effectively



Note: 72% of the participants reported that lack of financial resources prevents them from using robots more effectively. More than one obstacle can prevent effective use the technology. The number of responses by technologies reflects to the number of respondents who use the specific technology: 52 respondents provided answer regarding online courses, 38 on immersive technologies, 49 on robotics and simulators, 18 on personalised tools, 75 on digital examination, 70 on online meetings and 80 on school information. Results need to be interpreted with caution due to small sample sizes.
Source: OECD Survey on the use of technologies in VET.

How to tackle the high cost of technologies?

Introduction and use of technologies can be costly. It requires an upfront investment related to the purchase of equipment and software and upskilling of teachers. It also involves a cost of maintenance and possibly also licencing. The cost of technologies may vary considerably between types of technologies.

For example, Norway divides technologies used in schools into two categories: i) generic technologies such as virtual meeting applications and online resources that were not primarily developed to fit VET programmes and that often are available for free; and ii) teaching technologies developed to match school needs and support teaching and training in VET programmes (Oslo Economics, 2022[23]). Presumably, teaching technologies are more expensive than generic ones. Their initial cost may be higher as they target smaller markets - they are developed to match learning objectives of education and training systems, which means that the producer cannot offset the cost of the technology development by selling more products. Teaching technologies also are more expensive as VET institutions typically have to periodically renew a licence to be able to use the technology over time. While teaching technologies are typically more costly than generic ones they may lead to better outcomes. The fact that teaching technologies are developed for the education sector and that users may be able to provide feedback on the technology they are using to the supplier allows to evaluate the technologies and adjust if necessary. Teaching technologies are fit

for learning purpose and are less reliant on teacher's capacity to identify and adapt relevant online resources. Their quality varies less than the quality of free generic technologies and they pose less confidentiality risks (Oslo Economics, 2022[23]).

The OECD Survey on the use of technologies in VET shows that school information systems, robots and simulators and immersive technologies are more widespread in Estonia and Norway than in Scotland (UK). On the other hand, online meetings and courses are commonly found in VET providers in Scotland (based on the information provided by a small subset of Scottish providers). Drawing on the Norwegian classification, Scotland thus is more likely to use generic technologies, whereas teaching technologies are more common in Estonia and Norway. Differences in the design of VET systems and VET policies may explain variation across countries in the technologies used. In Norway and Estonia, public authorities own and run most VET institutions. This is very different from the fragmented Scottish landscape with many VET institution owners, a relatively low number of students per owner, and VET providers competing for students (which may discourage them from collaborating) (Kuczera and Jeon, 2019[24]). The introduction of technologies, and those requiring a large upfront investment such as school information systems and robotics, may be more difficult in fragmented VET systems with a low level of collaboration. School owners with larger populations typically have more funding and bargaining power with suppliers than smaller ones. They can introduce the same services across all their institutions, benefiting from economies of scale. Smaller vocational education institutions may have financial constraints that limit their access to expensive technologies.

Some countries opt for common measures and solutions to ensure universal access to some technologies and to compensate for financial differences across VET institutions and their capacity in invest in technologies. To facilitate access to technologies and digitalisation of schools, Norway developed a national solution for secure login and data sharing in education called Feide. It gives schools access to over 1 500 different services, learning materials and products. In 2019, the last county municipalities were connected to Feide. As of 7 December 2020, there have been 210 million registered logins on Feide, a significant increase from under 180 million in 2019 (Utdanningsdirektoratet, 2020[25]).

Transparency is important for VET providers to make informed decision of which technologies to invest in. Individual institutions may have limited information on technologies that are available on the market and their learning benefits and may therefore find it hard to identify and select the technology that could be most suited to their needs. As available technologies and applications are growing quickly, it may be hard for providers to separate the wheat from the chaff. Transparent markets thus facilitate access and use of technologies. To support and steer institutions in the choice of digital tools, grants for the purchase of technologies in Norway can only be spent on tools developed by suppliers in line with the Norwegian Education Act (Oslo Economics, 2022[23]). Evidence from Norway shows that setting up common standards and objectives for technological tools is beneficial to suppliers and VET system. For the suppliers, stricter requirements may increase the costs in the short term but decrease the future cost related to the development of new tools. The cost of developing tools according to defined standards will be lower compared to when producers have to adapt to a different system of regulations. Common standards would also facilitate access to technology for school owners and school managers. Standardisation will help to simplify the acquisition and administration of digital tools, which are seen by many users as very demanding (Oslo Economics, 2022[23]). However, government interventions to reduce costs may have a cost in themselves and risk injecting extraneous criteria into the choices of producers and consumers.

Also in Norway, to improve the access to and use of digital learning resources in upper-secondary education and increase the use and the variety of such resources, the Norwegian government allocated NOK 50 million to the development of digital teaching resources for subjects in upper-secondary education, including in VET. The national grant funded the Norwegian Digital Learning Arena (NDLA), key body in educational technologies built around the co-operation of counties (owners of the majority of upper-secondary VET institutions). Box 5.6 provides more detail on this initiative.

Box 5.6. Norwegian Digital Learning Arena

Norwegian Digital Learning Arena (NDLA) was established as a joint project by all counties except Oslo to develop digital solutions for all their upper-secondary schools, including VET programmes. It is a collaborative not-for profit organisation with the participating counties providing the funding and managing the scheme. NDLA offers freely available open digital learning resources for upper-secondary education. It provides a range of learning resources that are available with an open license that gives teachers, students and everyone else the right to use them. Open licenses provide the opportunity to share, use, create, modify and re-distribute learning resources (NDLA, 2023[26]). Among others, NDLA purchases goods and services on external markets through public procurement. The responsibility for the editorial work, organising, meta-tagging, and putting together the material in the respective subject areas lies with competent editing groups recruited from upper secondary schools in the counties. In 2021 NDLA bought goods and services from 98 suppliers (NDLA, 2021[27]). When the demand is not met by the supply, the editing groups will produce their own material.

NDLA is by far the largest provider of open learning resources in Norway, and the NDLA offer has expanded over time. Currently it provides learning resources in around 150 subject areas, as compared to 30 in 2009-2010. In VET, NDLA has learning materials for all education programs in year 1, as well as in selected subjects in year 2 (Oslo Economics, 2022[23]) (in Norway the first two years of a VET programmes are typically provided in schools and the last two in companies). The number of visits to the digital resources increased nine folds between 2010 and 2019 according to Google Analytics (NDLA, 2023[28]). NDLA is an important market player and there is some criticism that this situation can endanger competition in education and training technology market (Oslo Economics, 2022[23]). However, thanks to its position and available resources NDLA is able to develop digital resources in 'niche' VET subjects (Oslo Economics, 2022[23]). These subject areas may have been otherwise neglected by the technology suppliers as they are not profitable due to a limited number of potential consumers.

To ensure the proposed digital material meets the quality standards, the content of each site is quality controlled by researchers and specialists in that field. NDLA also sets up collaborations with several pilot schools where students and teachers try out and evaluate the teaching aids before they are put into use (NDLA, 2023[26]).

A survey carried out among Dutch VET institutions on the use of technologies confirms that collaborative approaches, knowledge sharing and a common vision would support VET institutions in a more effective use of technologies. For example, it may involve ensuring that available technologies correspond to learning goals, monitoring the quality of available tools, sharing best practices and a better overview of existing technologies. Dutch VET institutions also reported that they would welcome funding incentives to stimulate innovative practices and experimentation (ECBO, 2019[5]).

How to stimulate technological innovation and excellence?

Policy initiatives can also act on the supplier side and promote development of appropriate digital tools. This can involve investment in research and innovation, and development of digital tools in VET areas that would otherwise not be covered by technology, for example because of a small number of potential users.

In Norway, the government provides grants to suppliers for the development of specific technologies. Other country examples show that, policy makers establish partnerships with the private sector, or stimulate the production of new learning resources through innovation funds for specific industries. For instance, the US Department for Education established the Small Business Innovation Research programme, to give small enterprises access to funding to produce education technology (EdTech)

applications that could be later commercialised. The fund promotes the use of education technology to improve teaching practices and student learning outcomes (Small Business Innovation Research, 2020[29]). In England (UK), an EdTech Innovation Fund was established by the Nesta Foundation and the Department for Education. The Fund supports EdTech organisations in England aiming to improve their products, carry out research about the impact that the use of their tools has, and grow their reach to more schools and colleges in England (Nesta, 2019[30]). A first round of funding has already benefitted more than a dozen EdTech companies.

The Estonian experience demonstrates that technological excellence in education requires a consistent policy. After regaining independence in 1991 Estonia thoroughly reformed its education system using information technology. Estonia developed schools' local Internet connections, purchased devices for teachers, supported the creation of digital learning materials and advancement of teachers' digital skills. By 2001 all schools were equipped with computers and connected to the Internet and thousands of teachers took computer basic training course. The priority was given to the preparation of trainers working with teachers and to bringing the training close to the participants (e-Estonia, 2023[18]). Building on these achievements Estonia has kept innovating and developing its technological capacity in education. For example, the IT Academy Programme is a co-operation programme between the Estonian state, universities, vocational schools and information and communication technology (ICT) companies. It aims to increase the quality of ICT-related education, develop research in the field and ensure the necessary labour resources. In vocational education the IT Academy contributes to the quality of IT formal education in vocational schools, so that VET in IT areas is seen as attractive and prepares well for high-quality employment and further education (Haridus - Ja Noorteamet, 2023[31]).

How to improve digital skills of VET teachers?

The extent to which VET teachers will effectively integrate new technology into their activities depends strongly on their digital skills. Digital skills of VET teachers refer to technical skills in using technologies, knowledge of available technologies and their advantages and limitations. Data on actual digital skills of teachers is hard to come by, and the available evidence is mostly based on self-reported skills and abilities (which especially make cross-country comparisons difficult to interpret). Evidence from OECD countries shows that some VET teachers report not feeling fully confident to use digital technologies for teaching (Figure 5.7). Similarly, data from the SELFIE[2] tool developed by the European Commission shows that around one in four VET teachers in OECD countries (for which data are available) feel unprepared to use digital technologies in classroom teaching, and this share is higher among older VET teachers than young ones (Figure 5.8). A study looking at VET teachers in Switzerland confirms that their digital skills decrease with age[3]. The study also finds that technological skills of VET teachers differ by gender. Men have stronger digital competencies, are more confident in choosing digital tools and applying them to teaching and learning, and in assessing students' progress and competences. Women on the other hand are more likely to apply technology to personalise and differentiate learning following students' individual needs (Cattaneo, Antonietti and Rauseo, 2022[32]). However, the observed differences by gender may reflect overrepresentation of women in subjects that are less reliant on technologies.

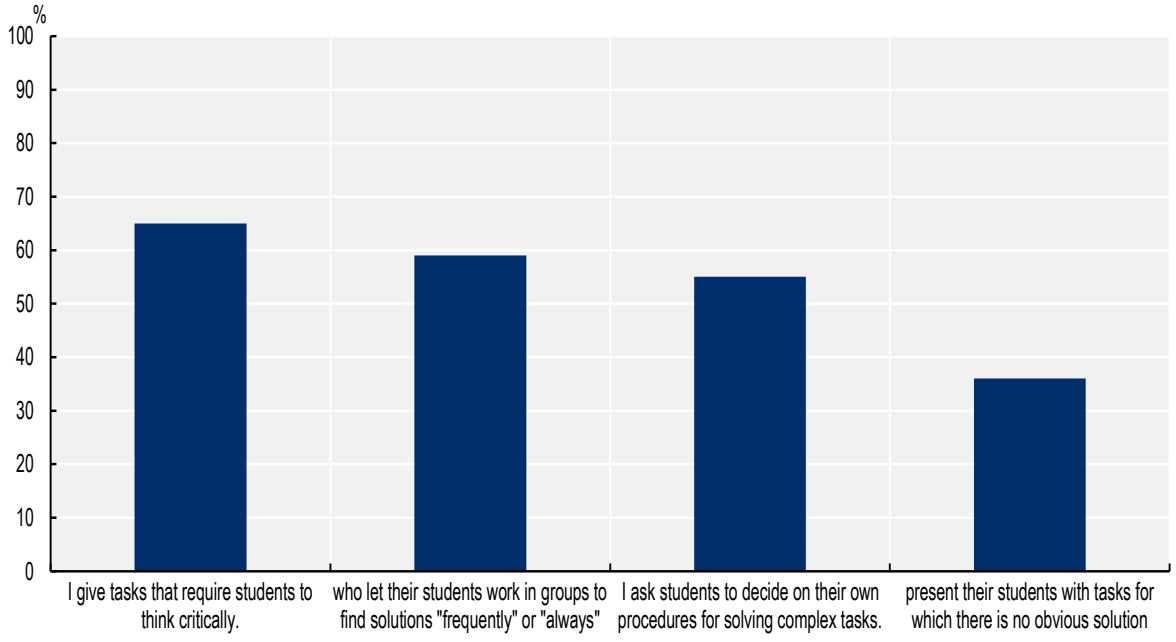
Likewise, the OECD Survey on the use of technologies in VET revealed that insufficient knowledge of technologies among teachers is a major barrier to more effective use of technologies in Estonia and Norway (Figure 5.8). Moreover, the survey shows that the choice and use of technologies is often up to the teacher, which represents a challenge, as technology savvy teachers have a better knowledge of existing tools, their advantages and limitation, and can use them with more confidence in their work. Independently of teachers' digital skills, motivation to use digital technologies may vary, which means that relying on teacher initiative would likely lead to important differences in the use of technologies. A survey carried out in the Netherlands points to similar conclusions (ECBO, 2019[5]). Variation in teacher digital skills may thus result in unequal access to technologies by students.

Successful introduction of technologies in VET institutions and equal access of students to digital tools hinges on VET teachers' digital skills and knowledge and the institutional support they receive. Cattaneo, Antonietti and Rauseo (2022[32]) provide insights on the institutional factors that are associated with technological preparedness of VET teachers. The study finds that classroom equipment and network infrastructure are not linked to digital competencies of VET teachers. In contrast, VET teachers from institutions that actively support professional development of the staff and with an institutional culture that values and foster adoption of technologies report better digital competencies (Cattaneo, Antonietti and Rauseo, 2022[32]). These findings show that students in VET institutions with the best technological equipment will not take advantage of it unless their teachers are acquainted with digital tools and can integrate them confidently in their work. Therefore, VET institutions with clear goals and strategy towards adoption and use of technologies can be expected to make the best use of digital solutions. Development and updating of teacher digital skills as well as guidance on how to integrate digital tools into curriculum should be part of this strategy. Countries provide policy tools to support VET institutions in reaching this goal. Some institutions may struggle with accessing technologies and without this additional support and guidance they would not able to provide technological tools to their students.

To improve teachers' technological ability countries have developed various tools that support VET teachers with the use of technologies (OECD, 2021[4]). For example, England (UK) has developed a competence framework supporting VET teachers and trainers in the use of technology in their classroom and training activities. Unlike the English approach that involves self-learning, Denmark set up physical infrastructure – knowledge centres, to support VET institutions and VET teachers and trainers with the use of technology. See Box 5.7 for more detail on these initiatives.

Figure 5.7. VET teachers struggling with the use of technology in teaching, 2018

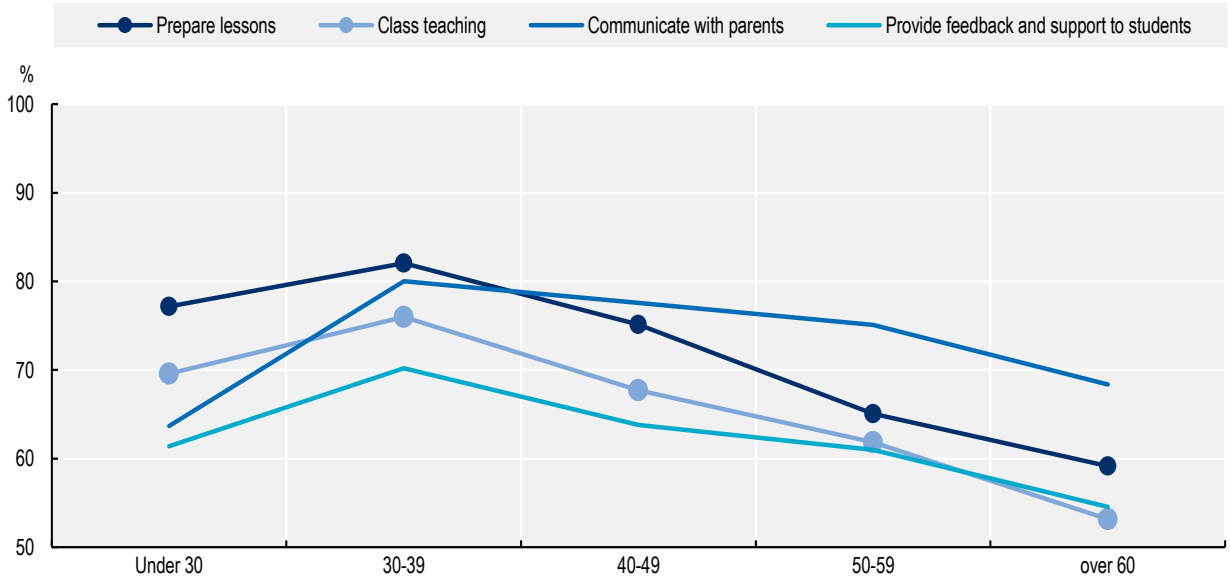
Percentage of upper-secondary VET teachers with limited ability to support their students learning through the use of digital technology.



Note: VET teachers are those who reported in the Teaching and Learning International Survey (TALIS) that they were teaching practical and vocational skills in the survey year in upper secondary programmes (ISCED 3), regardless of the type of school where they teach. The reported average corresponds to the unweighted average for the six OECD member countries/regions in the sample. Teachers with limited ability include teachers who reported 'not being at all able' or 'being able to some extent' to support their students learning with digital technologies.
Source: Elaboration based on OECD (2019[33]), TALIS 2018 database, www.oecd.org/education/talis/talis-2018-data.htm; OECD (2021[4]), *Teachers and Leaders in Vocational Education and Training*, https://doi.org/10.1787/59d4fbb1-en.

Figure 5.8. Confidence in the use of technologies among VET teachers

Proportion of upper secondary VET teachers in OECD countries who are (very) confident using digital technologies, by age



Note: All percentages refer to the share of high responses (i.e. 4 and 5 on a 5-point-scale). Participation in SELFIE is anonymous and voluntary, thus the data are not representative. Not all OECD countries are available and included in the dataset.
Disclaimer: This aggregated and anonymised data is extracted by the European Commission from SELFIE and does not necessarily reflect an official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this document. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.
Source: SELFIE database (extraction October 2018-December 2020); Hippe, R., Pokropek, A. and P. Costa (forthcoming[34]), Cross-country validation of the SELFIE tool for digital capacity building of vocational education and training schools; OECD (2021[4]), *Teachers and Leaders in Vocational Education and Training*, https://doi.org/10.1787/59d4fbb1-en.

Box 5.7. How do countries develop digital skills in VET teachers?

The Digital Teaching Professional Framework in England (UK)

The *Digital Teaching Professional Framework* is a competence framework for teaching and training practitioners in the further education and training sector. The framework has been developed in 2019 by the Education and Training Foundation in collaboration with the not-for-profit company Jisc. It has been designed to focus on the benefits of good pedagogy supported by technology to enhance learning.

The framework lists seven key elements of teaching using digital technologies: (1) planning your teaching; (2) approaches to teaching; (3) supporting learners to develop employability skills; (4) subject-specific and industry-specific teaching; (5) assessment; (6) accessibility and inclusion; and (7) self-development. Each of these elements contains a group of up to four key activities (components). For each key activity the framework includes a group of observable practices and standards.

The framework sets out three stages of competence for each of the activities. These three levels are defined as:

- Stage 1: Exploring: practitioners assimilate new information and develop basic digital practices.
- Stage 2: Adopting: practitioners apply their digital practices and expand them further.
- Stage 3: Leading: practitioners pass on their knowledge, critique existing practice and develop new practices.

Each element of the framework details the associated activities and digital competences practitioners would need to achieve in order to successfully progress through the three stages of personal development mapped out above.

The framework is accompanied by free, online, bite-size training modules with certification. Used alongside the Jisc Discovery Tool, a self-assessment tool that teaching staff can use to assess their digital capabilities, it enables practitioners to identify their training needs in order to help develop their teaching practice. For example, some of the modules are specifically designed to help teachers organise activities involving the use of technology that aim to develop soft skills of students.

Knowledge Centre for IT in teaching in Denmark

The Knowledge Centre for IT in Teaching promotes the use of advanced digital technology in VET. It focuses on supporting teachers in the use of IT for teaching across all subjects with a special focus on the pedagogical aspects of teaching practice making use of innovative technology. The centre provides professional development opportunities on IT issues for teachers in VET. Their PD courses include both theoretical and practical elements to support teaching and learning. The centre has also established a network of pedagogical staff and a network of leaders to facilitate the exchange of ideas and share their practical and technical knowledge, creating new solutions to common challenges.

Knowledge Centres for Automation and Robot Technology in Denmark

In parallel, the Danish Government created two Knowledge Centres for Automation and Robot Technology (north and south). These promote innovation in education and industry, supporting the work of VET schools making use of advanced technology such as universal robots, collaborative robots or VR applications for VET teaching. Each centre works with more than a dozen VET schools within their geographical area. They provide VET teachers with teaching material, such as teaching tutorials or short courses in Industry 4.0, VR equipment and robots. Additionally, their specialised facilities provide demonstrations to teachers and students on how robots can be used in the workplace.

The centres lend VR headsets and/or robots to VET teachers, providing them with training materials and face-to-face technical support, so they can operate these technologies and incorporate them into their teaching practice independently. VET teachers receive continuous support until they are fully able to set up and operate the new equipment. The centres provide these technological resources for VET programmes in the areas of industrial automation, mechanics, electronics, welding, data and communication, and education.

Source: OECD (2021[4]) Teachers and Leaders in Vocational Education and Training, https://doi.org/10.1787/59d4fbb1-en; Education and Training Foundation (2018[35]), *Taking Learning to the Next Level: Digital Teaching Professional Framework*, www.et-foundation.co.uk/wp-content/uploads/2018/11/181101-RGB-Spreads-ETF-Digital-Teaching-Professional-Framework-Full-v2.pdf.

Informal learning can also be a key strategy to develop teachers' skills in the area of digital technologies. Teacher networks for professional support are an increasingly important way to foster information sharing and informal learning in VET. They are an important asset for all teachers, but they are especially valuable to those looking to acquire pedagogical knowledge and skills making use of digital technology. For example, collaboration between various stakeholders and exchange of experience are at a heart of a Flemish initiative targeting more effective use of technologies in VET (Box 5.8).

Box 5.8. Upgrading VET teacher technological skills through collaboration: The InnoVET project in Flanders (Belgium)

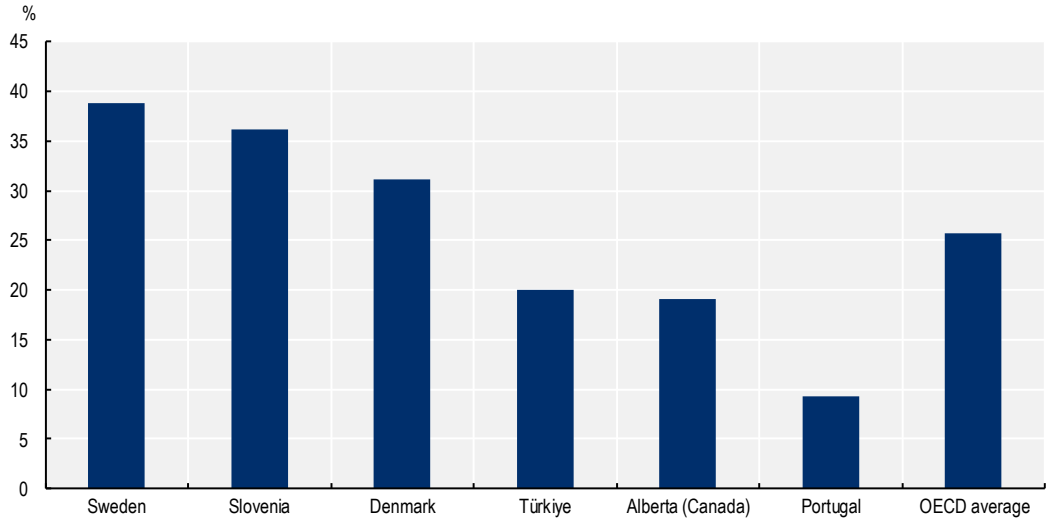
the Flemish government launched the InnoVET project to encourages VET providers to develop and use innovative technologies and pedagogies. VET schools are encouraged to develop and test innovative materials and methodologies through projects, with the intention of spreading this information to all VET programmes in Flanders. For example, it aims to support teachers in Flanders with the choice and use of technologies in classrooms. Schools participate by submitting projects. All projects should include an element of professional development for teachers, and need to be co-designed and co-funded by labour market actors. Materials and lessons learnt are shared across the VET sector. VET schools and teachers thus have the opportunity to share their experience using digital technologies. Between 2019-2022, 29 projects were selected (Vlaanderen Onderwijs en Vorming, 2023[36]).

How can VET adopt innovative pedagogical approaches?

The successful adoption of digital technologies in VET teaching do not only hinge on the digital skills of VET teachers, but also on their ability to use the appropriate pedagogical approaches to make the most of technology in their teaching activities. Moreover, as soft skills, such as complex problem-solving, creative thinking, and collaboration, become increasingly important in the labour market (as discussed in Chapter 4), teachers need to be able to develop them among their students which again calls for innovative pedagogical approaches.

Approaches such as inquiry-based, project-based and collaborative learning can help develop fundamental soft skills such as critical thinking, creativity, teamwork and communication. These pedagogical approaches can incorporate innovative elements such as gamification, blended learning and experiential learning. The use of innovative technology such as robots, virtual reality (VR), augmented reality (AR) and simulators allows teachers to develop students' vocational skills while also fostering their digital and soft skills. However, TALIS data show that innovative pedagogical approaches are only used by some VET teachers (Figure 5.9).

Figure 5.9. Use of learner-centred techniques by VET teachers



Note: VET teachers are those who reported in TALIS that they were teaching practical and vocational skills in the survey year in upper secondary programmes (ISCED 3), regardless of the type of school where they teach. These data are reported by teachers and refer to a randomly chosen class they currently teach from their weekly timetable. Unweighted average of six OECD countries/regions with ISCED 3 programmes (i.e., Alberta (Canada), Denmark, Portugal, Slovenia, Sweden and Türkiye).
Source: OECD (2019[33]), TALIS 2018 database, www.oecd.org/education/talis/talis-2018-data.htm.

Choosing appropriate pedagogical approaches

Until recently, teaching practices in VET mainly involved traditional face-to face lectures and tutorials, with a strong emphasis on vocational practice. Today, there is a need for pedagogical approaches to be learner centred, workplace oriented and inquiry based (see Box 5.9 for examples of some of these approaches). To foster soft skills development, pedagogy should emphasise active and experiential learning and collaborative learning, often using ICT as a key facilitator (Dumont, Istance and Benavides, 2010[37]; Paniagua and Istance, 2018[38]; Järvelä, 2006[39]). For instance, experiential and collaborative learning can be easily implemented through the use of digital technology (Järvelä, 2006[39]).

To effectively foster soft, digital and vocational skills development, VET teachers must choose the correct pedagogical approaches. For instance, inquiry-based learning, embodied learning and experiential learning approaches have been shown to foster the development of soft skills (Dumont, Istance and Benavides, 2010[37]; Paniagua and Istance, 2018[38]; Celio, Durlak and Dymnicki, 2011[40]). Collaborative learning models, such as inquiry-based or problem-based approaches, foster productive task-related interactions and enhance student motivation in general (Järvelä, 2006[39]). In other circumstances, vocational skills might be better developed using experiential learning. For digital skills, pedagogical approaches such as gamification and computational thinking have been shown to be effective (Paniagua and Istance, 2018[38]; Abdul Jabbar and Felicia, 2015[41]; Bower et al., 2017[42]).

To apply these pedagogical approaches effectively, teachers need to be familiar with the theoretical foundations underpinning them, as well as proficient in the use of ICT and specific teaching techniques. In-service formal training can provide the fundamental concepts, as well as ways to incorporate them into teaching practice. For instance, one common practice in teacher training to develop such pedagogical skills is to present groups of teachers with a complex technical problem, making available to them elements that can be used to solve it (tools, components, digital devices, access to the Internet, etc.). By experiencing problem solving themselves, teachers are able to understand how elements of collaborative learning and experiential learning can be used to teach vocational skills. By reflecting on their own practice and sharing their views with others, teachers see how they can make use of new technology to teach vocational subjects while developing students' soft skills.

Box 5.9. Emerging pedagogical approaches in VET

Although there are many pedagogical approaches to VET teaching available (Lucas, Spencer and Claxton, 2012[43]), some of them have particular importance today, as they allow the development of soft skills and digital skills. Three pedagogical approaches that have been successfully used for this purpose are:

- **Collaborative learning** is one of the most meaningful ways to support individual learning mechanisms. Through high-quality interactions this approach allows students to arrive at complex and conceptual understanding rather than simple answers. Technology can be designed to enhance personalised learning environments in ways that increase the possibility that those rich interactions occur (Järvelä, 2006[39]).
- **Inquiry-based learning** is an educational approach that focuses on investigation and problem solving. It prioritises problems that require critical and creative thinking so students can develop their ability to ask questions, design investigations, interpret evidence, form explanations and arguments, and communicate findings. Inquiry-based learning is different from traditional teaching approaches because it reverses the order of learning. Instead of presenting information, or "the answer", up front, teachers start with a range of scenarios, questions and problems for students to navigate. In inquiry-based learning, time and activities are organised around inquiry using different modalities such as world reading, individual research, projects and workshops (Paniagua and Istance, 2018[38]).
- **Active learning** is generally defined as any instructional method that engages students in the learning process. In short, active learning requires students to do meaningful learning activities and think about what they are doing. The core elements of active learning are student activity and engagement in the learning process. Active learning is often contrasted to the traditional lecture where students passively receive information from the instructor.

According to Paniagua and Instance (2018[38]) there are six clusters of innovative pedagogies that can complement – or be integrated into – these traditional approaches:

- **Embodied learning** refers to pedagogical approaches that focus on the non-mental factors involved in learning, and that signal the importance of the body and feelings, such as the physical, emotional and social aspect (Paniagua and Istance, 2018[38]).
- **Computational thinking** intersects with mathematics, sciences and digital literacy to offer a unified framework to develop a wide range of transversal skills through ICT. It is about using problem-solving skills and computer-based techniques to tackle problems (Paniagua and Istance, 2018[38]).
- **Experiential learning** is defined as approaches where learners are brought directly in contact with the realities being studied. It is based on the idea that human experience is a central source of learning, and therefore the design of learning environments should make use of human experience as part of the learning process (Paniagua and Istance, 2018[38]; Celio, Durlak and Dymnicki, 2011[40]).
- **Gamification** refers to the introduction of game design elements and game-like experiences in the design of learning processes. It has been adopted to support learning in a variety of subject areas integrating exploratory approaches to learning, and strengthening student creativity and retention. This is supported by the belief that incorporating game mechanics into the design of a learning process means learners will engage in a productive learning experience (Dichev and Dicheva, 2017[44]).

- **Blended learning** seeks to use the potential of new technology to offer more individualised teaching and direct instruction. The main goal of blended learning is to maximise the benefits of technology and digital resources, to improve the differentiation of instruction according to students' needs, as well as fostering classroom interaction. This approach assumes that the active involvement of students can best be achieved through group dynamics and intense face-to-face interactions. Computer technology then can offer direct instruction through individual, highly planned and structured sequences of skills. When computers provide the relevant information, teachers can then be free to spend more time on concept application, using more interactive and complex classroom activities or providing one-to-one instruction (Paniagua and Istance, 2018[38]).
- **Multi-literacies and discussion-based teaching** focus on students' active engagement and the availability of a multiplicity of texts, narratives and sources of information. Discussion-based teaching allows students to share, discuss and give sense to the implicit power relations and become aware of and value multiple modes of literacy. This is particularly relevant given how the Internet shapes the way people become informed and make sense of the world. Discussion-based teaching works as a pedagogical lever to teach rational thinking, affective judgements, and higher-order thinking skills (Paniagua and Istance, 2018[38]).

Some of these approaches are becoming increasingly important, as they use digital technology and allow students to develop soft skills, digital skills and other skills in high demand in the workplace.

Supporting VET teachers in innovating their pedagogy

VET teachers need access to professional development opportunities to develop their skills in new pedagogies, as also discussed in Chapter 2. This will allow them to make informed choices about which teaching strategies to choose. These training opportunities are particularly important, as OECD (2021[4]) analysis shows that VET teachers often lack pedagogical preparedness to adapt their teaching to new requirements. This might be especially the case for industry professionals entering the teaching profession with limited pedagogical training. Moreover, as pedagogical strategies evolve, teachers need to remain up to date with these new methods. The new technology currently available for VET teaching increases the variety of teaching approaches that can be used in VET to develop students' soft skills, and professional development opportunities should therefore also support VET teachers in the use of technology, while strengthening their digital skills. The English Enhance Digital Teaching platform provides training modules that support teachers in using digital technologies and innovating their pedagogical approaches (OECD, 2021[4]).

One of the key barriers to the systemic development of a more innovative approach to VET teaching is the lack of an agenda for policy change in this area in many countries. Changes in policy will only be implemented if there is a shared belief among VET stakeholders (especially teachers) about the importance of developing soft skills and digital skills and adopting new technology in VET, in response to digitalisation and automation in the workplace. Even in general programmes, soft skills still have a secondary place on the skills agenda: according to a survey in five countries (World Economic Forum, 2016[45]) parents and teachers in the general education sector do not assign the same priority to soft skills as to other skills, such as foundational skills. This has had implications on curricula and teachers' practice. A similar situation is found in the VET sector.

Box 5.10. Online training to support teachers' use of technology: Enhance Digital Teaching Platform (England, UK)

The Enhance Digital Teaching Platform – developed by the Education and Training Foundation in 2019 and funded by the Department for Education – supports teachers in England to use technology in their classrooms across the further education and training sector. The platform hosts free, bite-size, certified online self-learning training modules that support innovation in teaching and training to improve learners' outcomes.

Some of the modules are specifically designed to help teachers organise activities aimed at developing student soft skills making use of technology:

- Promoting collaboration and communication between learners incorporating learning activities which require learners to use digital technologies for collaborative processes, and for co-construction and co-creation of resources and knowledge.
- Promoting active learning, by allowing learners to actively engage with subject matter using digital technologies (e.g. using different senses, manipulating virtual objects, varying the problem set up to enquire into its structure, etc.).
- Encouraging the development of learner groups for peer learning and discussion, remotely monitored with intervention when needed, while allowing for student self-regulation.

Modules are mapped to the seven elements of the Digital Teaching Professional Framework, which promotes a set of professional standards for supporting learning through technology with the aim to establish a common understanding of digital skills development (Box 5.7).

Source: Education and Training Foundation (2020[46]), Enhance Digital Teaching Platform, www.et-foundation.co.uk/supporting/edtech-support/enhance-digital-teaching-platform.

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Notes

[1] Digital technologies (or digital solutions) refer to electronic tools, systems, devices and resources (such as personal computers and tablets, cameras, software and apps, augmented and virtual reality and the internet) that generate, store or process data. Digital learning is any type of learning that uses technology (Victoria State Government, 2023[47]).

[2]SELFIE is a free online tool designed to help schools embed digital technology into teaching, learning and assessment. SELFIE anonymously gathers the views of students, teachers and school leaders on how technology is used in their school (OECD, 2021[4]).

[3] The study looks at three category of VET professionals: teachers in VET schools for apprentices, trainers of apprentices from companies and training centres and VET teachers in bachelor VET programmes. The findings are similar across the three groups.

OECD Reviews of Vocational Education and Training

Building Future-Ready Vocational Education and Training Systems

A changing world of work brings the importance of Vocational Education and Training (VET) to the forefront, as it has the ability to develop the skills that are needed in today's labour markets and societies. At the same time, structural changes highlight the need to re-engineer certain parts of VET systems in some countries to make them more resilient and ensure they can make the most of the opportunities ongoing changes present.

This report zooms in on four key dimensions of future-ready VET systems: i) responsiveness to changing skill needs; ii) the flexibility to make VET work for all; iii) the ability to support transitions into a changing labour market and further learning; iv) the potential of digital technology to innovate VET design and delivery. For each of these dimensions, the report presents a set of key questions that policymakers and other VET stakeholders should consider when re-engineering VET to make it more future-ready, as well as insights from data and international examples of policies and practices.

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