OECD Skills Strategy 2019

SKILLS TO SHAPE A BETTER FUTURE

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Foreword

Skills are vital in enabling individuals and countries to thrive in an increasingly complex, interconnected and rapidly changing world. Countries in which people develop strong skills, learn throughout their lives, and use their skills fully and effectively at work and in society are more productive and innovative, enjoy higher levels of trust, better health outcomes and a higher quality of life. Skills policies play a central role in paving countries' development path by, for example, easing the adoption of new technologies and moving up the value added chain; they also make countries more attractive to foreign direct investment and tend to help foster more tolerant and cohesive societies.

Like globalisation, digitalisation and demographic change transform jobs and the way societies function and people interact. Against this background, the impetus for getting skills right is growing. To thrive in the world of tomorrow, people will need higher levels and different types of skills.

Implementing skills reforms effectively is a complex task, since skills policy is located at the intersection of education, labour market, industrial and other policy domains. This implies the need to coordinate and collaborate with a wide range of stakeholders, including ministries, officials at all levels of government, students, teachers, workers, employers, trade unions, and many others. Inter-sectoral reforms are often associated with very complex redistributive trade-offs as they are characterised by distribution and redistribution of resources across and between sectors as well as levels of government. Therefore, when designing and implementing skills policies, governments often face enormous political and technical challenges.

Since its launch in 2012, the OECD Skills Strategy has provided countries with a strategic and comprehensive approach to assessing their skills challenges and opportunities. In 2013, the OECD Skills Strategy approach went "national" with the development of tailored national skills strategy projects carried out in close co-operation with inter-ministerial teams in each country. Each project is designed to foster a whole-of-government approach, bringing together relevant ministries to better understand the country's goals for the future, identify the priority areas for action, as well as to design and align skills policies to improve that particular country's skills performance. In addition, these projects have engaged different stakeholders to improve our understanding of the current skills challenges and opportunities; solicit their perspectives on what policy responses are needed and supported; validate policy recommendations; and build support to take joint action to implement policies.

However, much has changed in the intervening years. The 2019 OECD Skills Strategy incorporates lessons learned from applying the OECD Skills Strategy framework in 11 countries, including new evidence about the implications of so-called megatrends, such as globalisation, digitalisation, population ageing or migration. It also accounts for new evidence about skills policies that work under the proper governance arrangements, including effective co-ordination and accountability mechanisms, efficient funding from different sources and information systems.

The 2019 OECD Skills Strategy draws upon learning across the Organisation, including the OECD Centre for Skills (SKC); the Directorate for Employment, Labour and Social Affairs (ELS); the Directorate for Education and Skills (EDU); the Directorate for Science, Technology and Innovation (STI); the Economics Department (ECO); the Centre for Tax Policy and Administration (CTP); the Centre for Entrepreneurship, SMEs, Regions and Cities (CFE); the Public Governance Directorate (GOV) and the Development Centre (DEV).

The update has also benefited from the strong support and fruitful exchanges with the delegates of the Education Policy Committee, the Employment, Labour and Social Affairs Committee, the Skills Strategy Advisory Group, and representatives of the Trade Union Advisory Committee and the Business and Industry Advisory Committee.

The key policy recommendations are organised around three broad components of the updated 2019 OECD Skills Strategy:

- ***Developing relevant skills over the life course.*** To ensure that countries are able to adapt and thrive in a rapidly changing world, all people need access to opportunities to develop and maintain strong proficiency in a broad set of skills. This process is lifelong, starting in childhood and youth and continuing throughout adulthood. It is also "life-wide", occurring not only formally in schools and higher education, but also non-formally and informally in the home, community and workplaces.
- ***Using skills effectively in work and society.*** Developing a strong and broad set of skills is just the first step. To ensure that countries and people gain the full economic and social value from investments in developing skills, people also need opportunities, encouragement and incentives to use their skills fully and effectively at work and in society.
- ***Strengthening the governance of skills systems.*** Success in developing and using relevant skills requires strong governance arrangements to promote co-ordination, co-operation and collaboration across the whole of government; engage stakeholders throughout the policy cycle; build integrated information systems; and align and coordinate financing arrangements.

Skills are an essential ingredient for human progress. As our societies and economies are increasingly shaped by new technologies and trends, getting skills policies right becomes even more critical for ensuring well-being and promoting growth that is inclusive and sustainable. The OECD will continue to work with countries to design, develop and deliver better skills policies for better lives in a rapidly changing world.

Angel Gurría,
Secretary-General,
Organisation for Economic Co-operation and Development

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Abbreviations and acronyms

The following are the main acronyms cited in this report. Other acronyms cited occasionally are defined where used.

ACE	Adult and continuing education
ACS	Slovenian Institute for Adult Education
AEGC	Adult Education Governance Council
AI	Artificial intelligence
BBiG	Berufsbildungsgesetz
BIBB	Bundesinstitut für Berufsbildung
CCFP	Comissão de Coordenação da Formação Profissional
CEDEFOP	European Centre for the Development of Vocational Training
CGFP	Conselho Geral de Formação Profissional
CHAMP	Consortium for HRD Ability Magnified Program
CNA	Certified nursing assistant
CPF	Compte Personnel de Formation
CV	Curriculum vitæ
DESI	Digital Economy and Society Index
DREAM	Denmark's Rational Economic Agent Model
ECEC	Early childhood education and care
ECTS	European Credit Transfer System
EHIS	Estonian Education Information System
EoI	Expression of Interest
ESCO	European Skills, Competences, Qualifications and Occupations
ESF	European Social Fund
EU	European Union
G20	Group of Twenty
GDP	Gross domestic product
GVC	Global value chain
HEA	Higher Education Authority
HEQCO	Higher Education Quality Council of Ontario
HPWPs	High-performance workplace practices
HVE	Higher Vocational Education
ICT	Information and communication technology
ILDS	Illinois Longitudinal Data System
ILO	International Labour Organization
INK	Indiana Network of Knowledge
JSC	Job security council
K-12	Kindergarten to 12th grade
LFS	Labour Force Survey
LOCME	Ley Orgánica de la Mejora de la Calidad Educativa
LPN	Licensed practical nurse
MCM	Ministerial Council Meeting
MLDS	Maryland Longitudinal Data System
MOOC	Massive open online course
NALA	National Adult Literacy Agency

NEET	Not in employment, education or training
NGO	Non-governmental organisation
NSC	National Skills Council
OECD	Organisation for Economic Co-operation and Development
O*NET	Occupational Information Network
PAC	Programme advisory committee
PARP	Polish Agency for Enterprise Development
PES	Public employment service
PIAAC	Programme for the International Assessment of Adult Competencies (Survey of Adult Skills)
PISA	Programme for International Student Assessment
PPPs	Public-private partnerships
QQI	Quality and Qualifications Ireland
R&D	Research and development
SAA	Skills assessment and anticipation
SANQ	Sistema de Anticipação de Necessidades de Qualificações
SES	Socio-economic status
SFI	Science Foundation Ireland
SME	Small- and medium-sized enterprise
SOC	Small online course
SPOC	Small private online course
STEM	Science, technology, engineering and mathematics
VDAB	Vlaamse Dienst voor Arbeidsbemiddeling en Beroepsopleiding
VET	Vocational education and training

Executive summary

Since its launch in 2012, the OECD Skills Strategy has aimed to support Members and Partners to achieve their economic and social ambitions by strengthening their skills systems. The strategy was developed as a horizontal OECD project bringing together the perspectives of all relevant committees and was prepared by a cross-directorate team.

Since 2013, the OECD Skills Strategy has "gone national" with the development of tailored national skills strategy projects carried out in close co-operation with inter-ministerial teams. Each national skills strategy project supports countries in developing national skills strategies by building on comparative OECD data, analysis and policy insights. Each project is designed to encourage a whole-of-government approach and, through a series of interactive workshops, engages relevant stakeholders to identify strengths and challenges of the current national skills system, explore policy options and develop an action plan.

To date, projects have been completed in ten OECD Member countries (Austria, Belgium [Flanders], Italy, Korea, Mexico, the Netherlands, Norway, Portugal, Slovenia and Spain) and in one non-Member (Peru). In Norway, Portugal and Slovenia, the initial project was followed up by a second project, which investigated a specific challenge identified in the first phase in greater detail, providing further in-depth analysis and recommendations.

The 2019 OECD Skills Strategy introduces a number of improvements

Much has been learned by the OECD since the launch of the original OECD Skills Strategy, and these lessons are incorporated in this update of the strategy. Specifically, the 2019 OECD Skills Strategy: takes account of the lessons learned from applying the OECD Skills Strategy framework in 11 countries; summarises new evidence about the implications of so-called megatrends, such as globalisation, digitalisation, population ageing and migration; and provides new evidence about skills policies that work.

In taking stock of the above, the 2019 OECD Skills Strategy introduces a number of improvements, including: a revised OECD Skills Strategy framework; a new OECD Skills Strategy Dashboard; key policy insights, good practice examples and policy recommendations for developing relevant skills, using skills effectively and strengthening the governance of skills systems.

The structure of the report

Chapter 1 ("Re-engineering skills systems") summarises the key messages of the report.

Chapter 2 ("Updating the OECD Skills Strategy") introduces the 2019 OECD Skills Strategy. It highlights what is new, including the revised OECD Skills Strategy framework, analysis of the skills implications of megatrends, a new OECD Skills Strategy Dashboard, and the identification of key policy findings and good practice examples for developing relevant skills, using skills effectively and strengthening the governance of skills systems. Finally, the chapter introduces and explains the three components of the updated 2019 Skills Strategy framework: 1) developing relevant skills over the life course; 2) using skills effectively in work and society; and 3) strengthening the governance of skills systems.

Chapter 3 ("The skills implications of megatrends") explains how a number of megatrends – including technological change, globalisation, and demographic changes – are making skills more important than ever for success in today's world. It explores the combined implications of these trends, including: their implications for the types of skills that will be needed for success in the future; the imperative of a lifelong learning approach; the imperative of ensuring more equitable opportunities and outcomes; and the imperative of making better use of technology as a learning pathway.

Chapter 4 ("Developing relevant skills over the life course") presents the OECD Skills Strategy Dashboard for developing relevant skills over the life course. It explores five policy priorities for improving performance in developing relevant skills: 1) raising aspirations for lifelong learning; 2) providing a good start for lifelong learning; 3) making lifelong learning affordable and sustainable; 4) making lifelong learning visible and rewarding; and 5) making lifelong learning accessible and relevant. It also presents a good number of country case studies from across the membership of the OECD.

Chapter 5 ("Using skills effectively in work and society") presents the OECD Skills Strategy Dashboard for using skills effectively. It explores a series of policy priorities relating to the use of skills, including: 1) promoting labour market participation; 2) promoting social participation; 3) expanding the pool of available talent; 4) making intensive use of skills in the workplace; 5) reducing skills imbalances; and 6) stimulating demand for high-level skills. It also presents a good number of country case studies from across the membership of the OECD.

Chapter 6 ("Strengthening the governance of skills systems") introduces the dimensions of effective governance of skills systems: 1) promoting co-ordination, co-operation and collaboration across the whole of government; 2) engaging stakeholders throughout the policy cycle; 3) building integrated information systems; and 4) aligning and co-ordinating financing arrangements. Once again, it presents a good number of country case studies from across the membership of the OECD.

Chapter 1. Re-engineering skills systems

This chapter presents the key messages of the OECD Skills Strategy 2019, providing a concise summary of the chapter on the skills implications of megatrends, as well as the chapters on the components of the skills strategy: 1) developing relevant skills over the life course; 2) using skills effectively in work and society; and 3) strengthening the governance of skills systems.

Overview

Given the rapid pace of change in today's world, a high degree of adaptability is needed for people to grasp life's many opportunities and address its myriad challenges. Important elements in developing adaptability include making sure people acquire the right mix of skills, use them effectively at work and in everyday life, and continuously update them throughout their lifetimes. Megatrends such as globalisation, digitalisation and demographic change are having a major impact on the way people work, socialise, obtain information, purchase goods and enjoy leisure time. These trends, in turn, increasingly influence the skills that people need to navigate this complexity, face uncertainty, and adapt to this rapidly changing landscape. The challenges are real and should not be underestimated, but much can be done to influence the outcomes. People equipped with the right skills for work and life will turn these challenges into opportunities and will play an active role in shaping the future. In contrast, people who remain ill-prepared will be at risk of being left behind and feeling threatened. The balance between the former and the latter will depend on whether governments implement the right policies and will determine whether countries thrive or struggle.

Since 2012, the OECD has embarked on an ambitious agenda to understand skills systems from a whole-of-government approach and identify good practices that lead to better outcomes, especially in a world where skills needs are changing substantially. This led to the development of the OECD Skills Strategy, which has since gone national. Its cross-government approach and recognition of the roles of other key stakeholders were designed to overcome the limitations of working in silos so that policies can be better aligned and co-ordinated in order to ensure a positive and substantial impact. It has also engaged stakeholders in the development and implementation of policies, learning from their expertise, creating a sense of ownership, and making them responsible and accountable for the roles they play. Work carried out in 11 countries have generated new insights and revealed some important barriers to success that need to be overcome in implementing skills policies.

Additional work carried out by different parts of the OECD has also contributed to this body of knowledge, by identifying: the best international practices that lead to high-quality and equitable education systems; how to better align the supply and demand for skills, thus minimising mismatches; the impact that skills have on employability and earnings, as well as on other social outcomes; and the relationships between the skills and productivity, as well as sustainable and inclusive economic growth.

At this point, the time is ripe to update the OECD Skills Strategy. The main changes included in the update are:

- **A revised strategy to respond to the megatrends** that are having and will have a significant impact on the skills needed for successful careers and fulfilling lives. A paradigm shift is needed in skills policies to ensure people can be equipped with higher levels of skills and with new sets of horizontal skills. In addition, traditional front-loaded education systems need to evolve into lifelong learning models, so that adults can continue to reskill and upskill in order to adapt to a rapidly changing landscape. This requires a redesign of skills systems.
- **A stronger emphasis on a whole-of-government and whole-of-society approach**, which builds on the lessons learned from working at the national level with many countries and has allowed us to conclude that the major factor limiting the impact of skills policies is the "silo" approach. The complexity of skills

systems requires that policies from different sectors (education, labour, industry, economy, tax, etc.,) are well aligned, and the trade-offs identified, in order to obtain the expected returns. A piece-meal approach risks having little impact.

- The introduction of a new component of the strategy: **strengthening the governance of skills systems**. The development of lifelong learning systems requires the participation of many actors including different ministries, levels of government (central, regional, local) and stakeholders (such as employers, unions and private providers). Governance refers to the way in which responsibilities are shared and co-ordinated between all the relevant actors, the way in which they contribute to efficient funding, and the development of information systems that help identify the respective roles of each stakeholder, the resources available, the policies to be adopted and the impact of these policies.

The skills implications of megatrends

Digitalisation

Digitalisation is leading to the automation of jobs and tasks that require low-level, routine skills. Most of the debate has focused on how many and which jobs will disappear, and whether these job losses will be offset by the creation of new types of jobs. Although initial estimates suggested that almost half of existing jobs would disappear, OECD evidence suggests that around 14% of jobs are at high risk of becoming fully automatable. Less attention has been given to the fact that even if jobs remain, many of the tasks performed may be automated, leading to a profound transformation of the nature of those jobs. Recent work from this perspective has reached the conclusion that, in addition to the jobs that risk disappearing because of automation, about 34% of current jobs will change significantly as many of the tasks currently performed by workers in those jobs may be automated. This implies that those jobs will shift the balance to non-routine, higher skilled tasks, requiring workers to upskill in order to avoid being displaced and to be able to perform the more demanding tasks. Digitalisation will also lead to the emergence of new types of jobs, and new forms of work, which are likely to require higher skills levels. Thus, it seems unlikely that workers in declining sectors, or those who will be displaced from their jobs, will find a safe haven in these emerging niches.

Globalisation

Globalisation has led to the emergence of global value chains that allow different parts of the production processes to be performed in different geographical locations. The general trend in OECD Member countries is for low-skilled, routine tasks to be offshored, leading to the loss of jobs in well-developed economies and the corresponding gain in developing and emerging countries. This process has led to greater convergence between world economies and to the decrease in poverty rates in low- and middle-income countries. This should be regarded as a positive overall outcome, but the challenges that it creates for OECD economies where many jobs are lost should also be addressed.

Demographic trends

Demographic trends in most OECD Member countries are the consequence of ageing populations. While employment rates – the share of people of working age in employment – are increasing in most countries, dependency rates – the ratio of older people (aged 65+) over the working age population (aged 16-64) – is increasing.

Increased longevity and better health at older ages imply that older workers can stay in the labour market longer, provided they have adequate incentives and support. Among them, there is certainly the need to provide them with adequate opportunities to reskill and upskill. The growing needs of elderly people also lead to the expansion of sectors that have to do with healthcare and social support, which are difficult to automate given that they require social and interpersonal skills.

Migration

Migration flows, even beyond the recent humanitarian refugee crisis, are on the rise and may well increase further in the future given the large demographic and economic imbalances across countries and regions of the world. Increased mobility has generated the potential to attract talent where it is most needed, and migrants may bring additional benefits since they tend to be entrepreneurial and innovative, introducing new ideas and business models. However, this requires pro-active migration policies that attract migrants, especially in areas where there are shortages. Moreover, it is essential to foster a rapid process of integration of migrants and refugees, which requires providing access to language courses, recognition of qualifications and competences, and rapid integration of children in the education system and adults in the labour market, among others.

Developing relevant skills over the life course: Making skills systems responsive

The main implications of these megatrends on changing skills needs are an increased demand for higher, non-routine skills and for different sets of skills, and the need to move from a front-loaded education system, which ends at early ages when students finish secondary or tertiary degrees, to lifelong learning.

These are major challenges since equipping people with higher levels of skills implies improving the quality of education systems without compromising equity. The new sets of skills required to thrive in the workplace and in modern societies are transversal skills such as complex problem solving, critical thinking, teamwork, resilience and adaptability, which demand teachers of high calibre. Finally, the re-engineering of traditional education systems into lifelong learning models requires the co-ordinated design of all stages starting from early childhood, and including schooling, vocational training, universities and adult learning.

Making each stage of learning a foundation for success in the next

Lifelong learning in its broadest sense covers all stages from early childhood education and care to adult learning. An early start can have a long-lasting impact on the ability to learn. An increasing body of evidence shows that children are able to acquire both cognitive and non-cognitive skills during early ages, before starting compulsory education. Even more, these early developments are crucial for enhancing their learning abilities later during formal education and while in the labour market. Children who have attended early childhood education and care (0-6 years) for at least two years, perform better when they are 15 years old according to evidence from the Programme for International Student Assessment (PISA). The boost in student outcomes is particularly strong for disadvantaged students since early childhood education and care seems to be an efficient compensatory mechanism for their challenging starts in life. Thus, removing financial and other barriers to early childhood education and care and ensuring its quality are essential.

Universal access to compulsory education is crucial. Yet, early school leaving is a major source of inequalities in some countries, since students who leave the education system early do so with low levels of skills, and tend to find great difficulties in engaging in any further form of learning or training, sometimes facing long spells of unemployment. These challenges have become magnified in an environment that demands higher levels of skills. Thus, the implementation of measures to detect students at risk of dropping out, the development of support measures and of flexible pathways, are crucial.

The quality of compulsory education needs to improve in order to equip students with higher levels of skills and new sets of skills. Comparative international evidence from PISA shows that there are major differences between countries in levels of student performance towards the end of lower secondary, equivalent to several years of schooling. Good practices can be learned from countries that have improved in the two dimensions that define a high-performing education system: quality and equity. It is feasible to improve overall student outcomes while at the same time minimising the impact of factors that consistently have a negative impact, such as student socio-economic background, gender biases, migrant status and regional differences. Unfortunately, education systems that improve student outcomes consistently over time are not widespread, but they do show the way forward. They prioritise teacher quality by selecting the best candidates; provide training to high standards; and develop career structures with the right incentives and professional development. Teachers become lifelong learners. Successful education systems also set high standards for all students by modernising their curricula and aligning it with evaluations that signpost the skills required at different stages. More diverse student populations also require more individualised teaching, which allows students to reach their goals through different pathways. Finally, disadvantaged students get additional support from the early stages, when compensatory measures are much more efficient than later on.

The gender dimension deserves particular attention. There seems to be a consistent trend for boys to perform better in mathematics and girls in reading, irrespective of the quality of the education system. However, PISA 2015 shows that boys and girls show similar proficiency levels in science. This being said, PISA findings indicate that girls perceive that they do not perform well and feel higher levels of anxiety, which seems associated with low expectations by both parents and teachers regarding their potential to achieve. This is also the case for mathematics, even for girls that show high levels of performance. The consequences of these early differences are significant since, although more women finish tertiary education than men, few women choose science, technology, engineering or mathematics (STEM) subjects at university (with the exception of those that are related to taking care of others, such as medicine) and are therefore under-represented in those sectors of the economy, which are more likely to grow in the digital era. For example, only 20% of tertiary graduates in information and communication technology-related fields are women. Thus, addressing the gender stereotyping that takes place at school is crucial for women to succeed in the digital economy.

Traditionally, vocational education and training (VET) systems were targeted at low performing students to help them acquire the skills required to work in sectors characterised by the performance of manual, low-skilled tasks. This conception of the role of VET reflects a past when economies relied to a larger extent on these sectors, and a higher proportion of the population had a lower level of skills. However, the world has changed. Most sectors have made (or are in the process of making) a transition to a different business model, more responsive to the needs of modern economies. Even workers in technical fields require higher levels and broader sets of skills. Modern VET

systems attract students with a broad range of performance levels and equip them with the skills required for middle- or high-skilled applied jobs, in which continuous on-the-job training is the norm. Modern VET systems are flexible, allowing students to move from VET to academic tracks (sometimes having more than two pathways), allow for progression to higher levels of educational attainment (including university), and place more emphasis on work-based learning. The strong links between VET systems and the labour market allow them to keep pace with the changes taking place in working environments. When properly designed, VET systems can offer high levels of employability and access to high-quality jobs, including emerging sectors such as the digital economy.

The most widespread response to the need to equip people with higher levels of skills has been to expand access to university. This represents a huge investment of resources and has led to the creation of many new universities and the diversification of degrees. Evidence from the Survey of Adult Skills (PIAAC) shows that in countries with high-quality education systems, tertiary education is associated with a considerable increase in the level of skills. When this is the case, the returns for university graduates remain high, despite the massive expansion. However, returns have not always met expectations in countries that have expanded access without ensuring high quality, since in these cases tertiary education does not lead to a substantial improvement in skills. Thus, it is important to keep in mind that increased access does not always imply a substantial improvement in skill levels and that the number of tertiary graduates is not an adequate measure of the skill levels of a population. In fact, PIAAC shows that some tertiary graduates have low levels of skills. The evidence from both PISA and PIAAC on the magnitude of differences in quality between education systems reveals that level of educational attainment is not a good proxy for levels of skills, nor is the number of years of education.

Thus, for both people and employers, educational degrees have become less reliable as guarantees of skills levels. In addition, the dynamism of the labour market requires more individualised, flexible and granular choices than traditional degrees. This has led to the development of new types of courses, including nano courses and different types of online courses (MOOCs: massive open online courses; SOCs: small online courses; SPOCs: small private online courses), which allow more flexibility for people to acquire skills through shorter periods as their needs to reskill or upskill change over time.

Enabling policies to support learning in adulthood

Given that working and social environments are changing rapidly, there is an emerging need for adults to reskill and upskill throughout their lives. A paradigm shift is taking place that requires the transformation of front-loaded education systems into effective lifelong learning models, in which adult learning is perhaps the stage that requires the development of radically new models in most countries. Traditional, front-loaded education systems equipped people with general and specialised skills during childhood and into the early 20s, and these were enough for people to get a job for life or at least jobs for life in the same sector. Evidence from PIAAC shows that with this model, the acquisition of skills increased until the education phase was over, and then declined over time due to obsolescence. People now face very different scenarios: they are likely to have several jobs during their working lives and to move from one sector to another. Even during the period in which they remain in the same job, the nature of that job will change rapidly. All this leads to the new imperative for people to reskill and upskill throughout their lives. But systems for lifelong learning cannot be undertaken by central

governments alone. Many actors, including employers, trade unions, regional and local authorities, private providers and individuals themselves who will become more responsible for making decisions about complex learning pathways, will all need to participate in crafting a new, lifelong learning model.

This new model in which people continue to learn and train during their lifetime, through formal, non-formal and informal means, requires a number of supporting policies:

- **High-quality assessment and anticipation systems** are needed in order to ensure that all actors have the information needed to guarantee that people are able to develop skills that are in high demand.
- **Mechanisms are needed to improve co-operation** between the individual, the employer and employment services, as well as training providers to better match the interests, aptitudes and skills of the individual on the one hand and the demands of the labour market on the other.
- **Efficient funding mechanisms** are required to leverage financial contributions from all those that benefit from investments in adult skills. Governments are unlikely to be able to afford the whole cost of implementing adult-learning systems; thus contributions will be required of governments, employers and individuals, and the optimal balance will depend on the needs and returns. Implementing the right incentives for employers and workers is crucial, as it is to provide targeted funding for training in skills shortages and for disadvantaged groups.
- **Systems to recognise and certify skills** are needed to incentivise adults to continue learning through adulthood. It seems clear that new models of credentials that reflect actual skillsets are required, but it is an open question to what extent (or when) they will replace traditional educational degrees. For individuals, this can lead to higher employability, skills use and job satisfaction. It can also be a bridge to re-engage with formal learning by limiting the amount of time and cost required to complete a credential. For employers, having a better understanding of the skills of their employees can lead to higher productivity and reduced staff turnover. For society at large, skills recognition can improve skills matches in the labour market, leading to improved economic growth and more resilient and inclusive societies.
- **Effective career guidance systems** are increasingly important to help people navigate complex ecosystems at many different stages of their lives. Lifelong learning systems will require that people make many decisions at different stages about the different forms of formal, non-formal and informal learning and training required to move to a new job, keep a current one or get a promotion. The offer for adult learning is very broad, and these decisions will have a major impact on the ability of people to cope with change.

Supporting teachers to become lifelong learners

In order to face the challenges mentioned above, people also need new sets of skills. Employer surveys consistently show the demand is rising quickly for horizontal skills such as complex problem solving, critical thinking, teamwork, creativity, innovation, resilience and adaptability. However, traditional education systems often do not equip people with these skills. Thus, a major transformation is required so that teachers obtain the support required to acquire these skills and learn how to teach them. This a major task that will require new models of teacher training and professional development. It also involves developing new curricula that include these skills in a transversal way, so that they are taught in every subject and not as separate topics.

Teacher careers should be well structured so that teachers can follow different pathways depending on their interests. In addition, professional development should be designed so that teachers have the incentives and the time to obtain the training they need to become the driving force of education systems that will need to adapt rapidly (but consistently) to changing demands from society and the workplace.

Financing adult learning

Since much adult learning takes place in the workplace, it is important that employers are involved in the design, implementation and financing of adult-learning systems. For these models to be successful, the balance of benefits and costs need to be positive for the employer, as well as for the employee. In this respect, small- and medium-sized enterprises (SMEs) face particular challenges, since the costs are high (fewer staff and resources) and the benefits low (retention rates are low when other SMEs do not invest in training and poach those who have been trained by others). Thus, specific policies need to be developed, particularly in countries in which SMEs represent a large proportion of firms.

Harnessing the power of technology as a tool for learning

It is often suggested that the challenges that the technological revolution has generated can be at least partly addressed by digital tools. However, it is surprising that education systems are lagging behind many other sectors in the use of information and communication technology (ICT) to improve outcomes since their role is to prepare students for a digital future. Perhaps one of the biggest mistakes has been to assume that introducing laptops and tablets in the classroom would be a faster and cheaper alternative to the daunting task of improving teacher quality. OECD evidence shows that this is not the case: the mere presence of technological devices in the classroom is not enough to improve student performance. However, technology holds great promise when teachers are trained to make use of it to improve learning environments, develop more individualised teaching, and save time on the tasks that can be automated, focussing on the new horizontal tasks that technology cannot substitute for, such as creativity, critical thinking and teamwork. Technology in the classroom will never replace teachers. On the contrary, it requires high-quality teachers to be able to use it in order to develop more sophisticated teaching methods and equip students with a broader range of skills.

The opportunities that technology brings to connect people globally has led to the creation of networks in which teachers exchange good practices, including videos of teachers in classrooms, as well as materials, and ideas to improve teaching methods. These global communities of teachers have become a very useful tool for teachers to learn from each other and innovate.

Technology seems to have played a more relevant (and disruptive role) in higher education and adult learning. In many countries, these stages of learning have become very dynamic with new models emerging to adapt to the changing needs of adults, as well as younger generations. Thus, a variety of online courses and blended courses are being developed, in order to offer shorter, more focused and granular approaches that seem to match the needs of young and older adults better, both at university and in vocational education and training.

Using skills effectively in work and society: Making the most of everyone's potential

The degree to which skills are supplied and used in both the economy and society has significant implications for the returns that individuals and countries can expect to receive from their investments in skills. Supply-side interventions will only achieve the desired productivity gains if they are accompanied by simultaneous actions to boost the demand for and effective use of skills. Indeed, the failure to fully utilise skills could result in a waste of the initial investment in human capital, the depreciation and obsolescence of the skills that are left unused and the potential loss of people with higher levels of skills who could move to places where the returns on skills are higher.

Comparative evidence shows that countries that perform well in skills development tend to make extensive use of skills in the workplace and have well-performing labour markets, with high levels of employment. However, the two do not necessarily go together, since some countries have comparatively high levels of skills but do not seem to use them effectively in the workplace, leading to rapid skills obsolescence, while others make much better use of a limited pool of skills.

Making full use of everyone's skills

The combination of the quality of education and training systems and the extent to which the skills acquired are used and further developed at work determine the level of skills of a population. PIAAC shows that countries vary to a large extent in the average level of skills and how they are distributed among different groups. A few countries have a similar level of skills between younger and older generations, due to the lack of progress made over the last 40-50 years. However, most have major age-related differences: young people have much higher levels of skills than older generations, either because the expansion to higher levels of educational attainment has occurred recently or because the quality of education systems has improved greatly over time. Thus, the most widespread trend is for older generations to have lower levels of skills.

In most countries participating in the PIAAC, the pool of adults with low levels of skills is much larger than expected, which implies that policies need to be developed for them. Because groups with low levels of skills are quite diverse (e.g. early school leavers, long-term unemployed, older generations), different and well-targeted interventions are needed. However, PIAAC data show that only 41% of adults surveyed participate in formal or non-formal adult learning. A major concern is the fact that adults who need further training and learning the most are the least likely to seek and benefit from it. These include adults with low levels of skills at jobs that are likely to be automated, as well as the long-term unemployed and, more generally, workers in SMEs. For some, the main barrier is lack of motivation, either because they are not aware of their actual skills levels or do not see the benefit. For others, provision of training opportunities is more limited, either because of the limited capacity of employers to finance it and/or manage the absence of the workers or because of the lack of incentives for the employer to invest

in the human capital of the (often low-skilled) worker. Thus, it is crucial that policies are put in place so that individuals understand the value of learning and training. In contrast, highly skilled adults make ample use of the broad range of opportunities that they have (training at work, online courses, etc.) to continuously upskill. These trends could lead to a growing gap between the high- and low-skilled, as the development of new tools to upskill expands. Thus, ensuring broad participation in adult learning must top the agendas of governments, employers and social partners. This requires designing incentives for employers, developing mechanisms to allow the portability of training rights between employers, and raising motivation.

Most OECD Member countries have recovered from the recent economic crisis, but some scars remain. In countries with large pools of low-skilled adults who used to be employed in declining sectors, unemployment remains high. In particular, youth unemployment and long-term unemployment seem difficult to overcome in contexts in which there are high levels of early school leaving and youth not in education, employment or training (NEETs), and where the unemployed experience skills erosion and motivation loss over time.

In most countries, governments are responsible for training the unemployed, but when traditional training models are followed, they often involve offering courses that are not well aligned to labour market needs and do not result in upskilling. On the other hand, efficient systems use considerable amounts of funding to assess actual skills, equip people with skills demanded by the labour market and provide appropriate career guidance by integrating a vast amount of information on job prospects and the required training to qualify for them. Thus, for those who lose their jobs, safety nets need to be in place, linked to activation strategies, to enable them to integrate again into the labour market before their skills deteriorate.

In addition, early intervention services appear to be quite effective, by initiating re-employment services in sectors that are declining before people lose their jobs. However, they are not used as widely as desired and are often limited to workers affected by mass layoffs. Policies need to be developed to help workers move from declining sectors, industries and regions, to those where there are opportunities. This will avoid large parts of the population becoming unemployed for long spells of time, and will contribute to inclusive economic growth and rapid technological progress.

Finally, unemployment benefits are still largely based on the notion of an employer-employee relationship; new models need to be designed, however, to adapt to the new world of work. Individuals in non-standard forms of employment, such as the self-employed, temporary as well as part-time workers, are particularly vulnerable given the scarcity of safety nets for them. This may require a fundamental paradigm shift, where entitlements are linked to individuals rather than jobs, and portable from one job to the next.

Making the most of migrants' skills

Given the large influx of migrants into many OECD Member countries and their specific circumstances, this group requires specific efforts to encourage effective integration. Migrants now account for one in ten people living in OECD Member countries, and immigrants comprise between one-quarter and one-half of new entries to the labour force. Some countries have developed specific policies to attract migrants with relevant skills to address the shortage of skills in certain economic sectors. These selective policies have led to stronger economies. In those cases in which migrants are fleeing regions of conflict

or looking for better economic prospects, countries need to put in place mechanisms to assess the level of skills of migrants in order to identify potential job prospects, while at the same time provide language training. In general, low-educated immigrants and native-born peers have comparable levels of employment rates. In contrast, the employment rates of highly educated immigrants tend to be lower than their native counterparts. One reason is that employers have poor knowledge of the actual level of skills associated with foreign degrees. Thus, training must account for individual skills needs and be geared towards labour market integration.

Activating skills to build more inclusive and cohesive societies

Adult skill levels are also associated with levels of social cohesion. Adults with higher levels of skills have higher levels of trust in others, in institutions and in governments, perceive themselves as having better health, and feel that they participate actively in society. This sense of social cohesion will become more relevant as the complexity of our societies increases, the issues on which decisions need to be taken become more difficult to understand, and a global perspective is required. At the same time, technology has led to exponential growth of sources of information, so being able to discriminate between different sources and content and to integrate vast amounts of information, has become more important than ever before. Highly skilled people will be more motivated and able to tackle this complexity, while others will seek the refuge of echo chambers where only like-minded people participate, or they will simply ignore the issues at stake, under the impression that nothing they say or do will make a difference. The erosion of trust in governments and the fact that growing sectors of the population are becoming less active as citizens is a major threat to the effective functioning of democratic societies.

Making intensive use of skills in work

Encouraging and supporting individuals to bring their skills to the labour market is only the first step towards ensuring that skills are used fully and effectively. The developing of skills-intensive workplaces matters greatly for ensuring high returns to investments in developing skills. Governments can support firms by raising awareness about the benefits of improved organisation and management practices that contribute to better skills use, including teamwork, task discretion, mentoring, job rotation, applying new learning, incentive pay and flexible working hours. Governments can also disseminate good practice, develop diagnostic tools to help firms identify room for improvement, promote knowledge transfer and offer management skills development programmes. Interventions should be particularly targeted to SMEs, who face cost constraints in implementing new management and organisation practices.

Aligning skills with the needs of the economy and society

In a context of rapid change, mismatches are more likely to emerge between the sets of skills that workers have and those demanded by the labour market. Indeed, in most countries, employers report that they are unable to find people with the skills they need. There are several measures of mismatch, which have very different implications. The type of mismatch that is most prevalent is field-of-study mismatch (around 40%), i.e. people working in a different study or field than the one they have studied for. This clearly shows that people make choices that are not always well aligned with labour market needs. More information on employability rates, the range of wages and sectors with high demand, could contribute to rebalancing skills supply and demand. The second is qualification mismatch: about 20% of the workforce has higher qualifications than their

jobs require. However, the level of skills mismatch is much lower, suggesting that in many cases people with those degrees do not have the level of skills that would be expected and that employers are finding ways to match people to the skills required for jobs. Despite the smaller magnitude of skills mismatches, it is an issue that leads to wage penalties for individuals and productivity costs for the economy and should be addressed.

Aligning skills policies with industrial and innovation policies

Digitalisation and globalisation are likely to generate greater distortions, as jobs and tasks become automated or offshored. Thus, people who occupy these jobs are at risk of becoming unemployed or displaced. As a result, there is a widespread trend for job polarisation, with the demand for high-skilled jobs increasing, middle-skilled jobs declining, and low-skilled jobs remaining more or less stable. Those people who acquire the skills required to adapt to these changes will have jobs that are more creative and fulfilling, and in which automation will be seen as an ally rather than a threat. Workers will rely on robots to carry out the routine tasks and integrate massive amounts of information, while workers will be responsible for decision making at higher levels. These megatrends also allow individuals around the world to bring their ideas into the market more easily, boosting opportunities for entrepreneurship. Digital technologies have also enabled the rise of the platform economy.

In this rapidly changing environment, skills policies need to be well aligned with industrial and innovation policies, so that employers can access the skills they need to move their firms to higher value-added and innovation-intensive activities. Innovation and industrial policies can also be designed to encourage skills development through training and knowledge transfer. Innovation requires strong STEM skills, as well as soft and entrepreneurial skills. Investing in research and development (R&D) helps to develop knowledge and skills, spurs innovation and enhances a firm's ability to absorb and exploit the available knowledge base. On the other hand, when skills policies are not aligned with industrial and innovation policies, countries and regions may get trapped into "low skills equilibria". These are characterised by workforces made up of adults with low skills who have little incentive to upgrade their skills since they know it would be difficult to find jobs rewarding their efforts; and by employers who cannot move to higher value-added activities given the low skill levels of the workforce. Low-skill equilibria hinder growth and economic development and make economies vulnerable to economic and technological shocks, such as those related to global value chains or the digital transformation.

Strengthening the governance of skills systems: Tackling increased complexity

Across the spectrum of policy sectors, policies aimed at improving skills outcomes – skills policies – are a prominent example of complexity. The success of policies to improve the development and use of skills typically depends on the responses and actions of a wide range of actors, including government, students, teachers, workers, employers, trade unions, etc. In many regards, the policy area of skills policies is fundamentally different from other policy areas. They have widespread support given their relevance in improving people's labour market outcomes and well-being, and the central role they play in boosting countries' economic development and inclusive growth. However, they are much more complex than many other policies because they are located at the intersection of education, labour market, industrial and other policy domains. Thus, they also generate

conflicts of interest between powerful stakeholders and the need to co-ordinate and align policies from different sectors.

The complexity of implementing reforms increases when policies involve a wide range of actors and entities, such as different levels of government and stakeholders, and cut across multiple policy sectors. When designing and implementing inter-sectoral policies, governments often face enormous political and technical challenges, including the need to co-ordinate across different levels of government, to engage with stakeholders, and to define the financial and information aspects of the reform, among others. Furthermore, inter-sectoral reforms are often associated with very complex redistributive trade-offs as they often go along with the distribution and redistribution of resources across and between sectors as well as levels of government.

Current reform efforts addressing the skills system often take place in the context of decentralisation processes, which delegate the administration and partly the financing of social services, implying that more policies and services will be designed and delivered with or by sub-central authorities, social partners and other stakeholders, whose actions are not always under the control of central authorities. In consequence, designing governance systems that can both ensure a co-ordinated approach to steering and priority setting and remain sensitive to particular regional and sectoral needs is challenging.

In fact, the 14 OECD Skills Strategy Diagnostic Reports completed to date show that inherent difficulties in co-ordinating and aligning different policy sectors and actors is among the main challenges impeding more effective and efficient implementation of skills policies. Many of today's skills challenges are rooted in poor governance arrangements across policy areas and levels of government as well as with stakeholders, inadequate information on skills and learning outcomes, and inefficient financing mechanisms. Government structures and bodies are usually designed to advance specific sectoral policies and do not co-ordinate actions across sectors.

Promoting co-ordination, co-operation and collaboration across the whole of government

Skills-related policies are rarely the exclusive domain of one ministry or level of government. Higher levels of co-ordination, co-operation and collaboration have the potential to improve skills outcomes. The co-ordination of different policy areas is facilitated if there is a shared conviction that skills are a national priority. Governments should encourage co-ordination between central and sub-national authorities. A good first step is to map all the policies and institutional actors that affect skills development and skills use. Co-ordination efforts should be supported by the right institutions. These institutions can take various shapes. However, it is important that they adopt a "life-course perspective" and put in place effective monitoring and evaluation mechanisms to assess the functioning of the skills systems

The development of a whole-of-government approach to skills policies is in many countries hampered by the complexities of multi-level governance arrangements, which distribute policy-making authority unevenly across different policy sectors. For instance, in many countries, the authority for education policy is delegated to sub-national governments or divided between the central and regional governments. In contrast, labour market and lifelong learning policies are often the responsibility of federal/central agencies in order to ensure joint standards on national labour markets, but in other countries, the local governments are important in administering and financing these policies. In any case, often the policy-making authority for different elements of a

comprehensive set of skills policies are distributed unevenly across different levels of government, turning co-ordination across these levels of government into a significant challenge for policy makers. Irrespective of which model is present in different countries and how responsibilities are defined between levels of governance, the most effective mechanisms to avoid growing disparities between regions is for central government to remain responsible for defining common standards of the appropriate levels of skills for each level of educational attainment and training models for all regions, and to evaluate the efficiency of the different actors and policies.

Engaging stakeholders throughout the policy cycle

The need to engage stakeholders emerges from the complexity and the multiplicity of policy actions that need to be undertaken to improve a country's human capital development and use. Policy makers dealing with complex policy choices need and benefit from stakeholders' expertise and knowledge. But engaging stakeholders also enhances the legitimacy of policy-making decisions. A first step towards engaging stakeholders is to map all the players in the skills system and identify how and to what extent they interact with each other. It is very important that engagement leads to something tangible in practice, and stakeholders must have opportunities to influence skills policy. However, it is critical that their involvement in decision making does not lead to the "capture" of public institutions by private interests.

Effective and politically legitimate governance of skills systems requires policy makers to engage with relevant stakeholders in the field. The challenge here is to identify the relevant actors while balancing out potential power asymmetries between highly organised special interests and the often weakly organised and more diffuse collective interests. Engagement with stakeholders needs to go beyond the classic tripartite bodies representing business, labour and state interests found in many countries. In the context of lifelong learning, the success of skills policies is increasingly influenced by and dependent on a larger number of stakeholders, representing emerging sectors of the economy such as new tech firms and training providers, as well as new types of employees (e.g. the self-employed and atypical workers) many of whom are not necessarily well represented by traditional institutions or entities. In developing an encompassing skills strategy, it is important to appeal to both the traditional and well-established associations in the economy as well as those representing newly emerging interests.

More concretely, the whole-of-government approach aims to pursue long-term skills policy agendas, establishing strong institutions that monitor and evaluate the implementation and outcomes of policy reforms, engaging stakeholders directly to share the ownership (or burden) of the policy reform within a framework in which the public sector remains accountable for the quality and accessibility of services; and, finally, at addressing asymmetries between the winners and losers of reform processes. The latter point – the redistributive implications of policy reform – can often become a major obstacle in the design and implementation of policy reforms. In order to prevent gridlock in the later stages of the implementation process, it is, therefore, crucial to involve stakeholders in earlier stages of the decision-making process.

Furthermore, co-operation can be achieved in more formal ways such as the creation of specific institutions or councils that guarantee the continuity of the dialogue among the main stakeholders. While designing the institutions and deliberative forums, it is important to pay attention to the potential trade-off between the number of stakeholders to

be involved and the effectiveness of decision making. If the number of stakeholders and bargaining partners is too large, the deliberative process runs the risk of becoming too cumbersome, which could effectively lead to a rather superficial and ineffective involvement of stakeholders. Government actors can prevent this situation by encouraging stakeholders to organise themselves before participating in the deliberation process, i.e. by appointing spokespersons for a particular sector or group of stakeholders. However, the concomitant danger in this situation is that if the number of stakeholders drops too low, it could trigger concerns about the broadness of the group of stakeholders involved. There is no simple solution to these trade-offs, as countries differ widely with regard to the number and kind of societal stakeholders. Governments should be aware, however, of the challenges related to the organisation and involvement of societal actors in public policy making.

The government can also be pro-active and participate in existing fora created and managed by stakeholder organisations/entities. Besides promoting skills policy dialogue, this methodology has the advantage of demonstrating to stakeholders that their perspectives matter to the government. It is not only a matter of governments engaging stakeholders but also about ensuring that governments themselves are willing to be engaged. In addition, this pro-active approach can be important when stakeholders are particularly weak and marginalised due to their lack of organisation, fiscal or administrative capacities (including lack of organised representation) that negatively affect their ability to engage with policies and dialogues.

Finally, some skills reforms can improve the welfare of some groups of stakeholders, while negatively affecting others. Even though the process of stakeholder engagement could and should strive to find consensual solutions to policy problems, there may be instances where policy solutions involve difficult trade-offs. Government actors cannot stay out of these political conflicts but should remain a neutral arbiter to the greatest extent possible in order to ensure that stakeholders, in general, remain committed to the collective effort. Increasing the input from and involvement of empirical research may help to pacify potential conflicts of interest as evidence-based policy making can contribute to developing a foundation of objectivity shared and recognised by all involved.

Building integrated information systems

As skills systems evolve and become more complex, managing data and information becomes a key policy issue. Effective information systems are needed to collect and manage the data and information that governments and stakeholders produce, analyse and disseminate to ensure that policy makers, firms, individuals and others have access to accurate, timely, detailed and tailored information.

Relevant data and information include measuring the actual levels of skills of individuals, identifying the skills demanded by the labour market, anticipating skills needs in the future, as well as information on learning and training opportunities and their effectiveness.

Policy makers should make use of these data to evaluate the impact of the policies that they implement so that they can test whether training programmes are raising the levels of skills of individuals and improving their employability. Accurate assessments of over- or under-supply of skills may also help policy makers develop initiatives to achieve better matching between supply and demand, by putting in place incentives to skills investments in those areas or incentives for people to acquire skills that are in shortage.

Sound career guidance should be based on solid data on the outcomes of different options (for example, university and vocational training), institutions and field of study, in terms of employability and earnings. Similarly, education and training institutions can make good use of data on changing trends in skills demand, to better align their programme and degree offers.

However, there are major challenges that need to be overcome. First, privacy issues may pose limits to the kind of information that can be gathered and/or disseminated. Second, there is a large number of data sources that need to be integrated. Third, there is a multiplicity of end-users with different needs, who may, therefore, require access to different parts of the information or different levels of aggregation.

Aligning and co-ordinating financing arrangements

Governance and financing are inexorably intertwined. Efforts aimed at improving the efficiency of expenditures on skills need to be accompanied by strong institutional capacity. Financial arrangements should rely upon more flexible cost-sharing mechanisms that facilitate integration from multiple sources. Public funds ought to be allocated carefully to promote better policy outcomes and to ensure equitable access to skills development opportunities for all. A first step in prioritising skills investments and expenditures is to assess the financing gaps in the systems. Investment strategies ought to be defined in line with the medium-term strategic priorities of government. Resources need to be allocated in such a way that responsibilities and accountability mechanisms are matched with funding so that those with responsibilities have the capacity and funding to operate at the desired standard of service.

The main challenges associated with putting in place effective funding arrangements are:

- **Diversifying sources of funding**. Promoting the development and use of skills, especially in the context of lifelong learning is costly and may require that the costs and benefits of skills investments are more equitably shared between governments, individuals and the private sector – with country-specific differences in how exactly this balance is achieved. In a context of increasing pressure on state budgets, financial arrangements will increasingly rely upon more flexible cost-sharing mechanisms that facilitate integration with resources from private households and employers on the one hand, and public budgets both at the central and at the sub-central level on the other. Investments in human capital create both public (societal) and private individual benefits (in terms of higher wages and/or increased productivity); hence a sharing of costs between public and private actors is justified to some extent, although politically contentious in many cases as it involves redistributive trade-offs between the different groups of stakeholders. Finding the right mix of public versus private funding requires an assessment of the benefit to each party as well as co-ordination efforts to align the incentives of public and private actors. Furthermore, the relative mix between public and private sources of funding might vary across sectors. For instance, investing in early childhood education and care could be recognised as a public good as it is deemed to be particularly effective in mitigating educational inequalities in the early stages of the lifecycle. On the other hand, investments in skill formation at higher levels (post-secondary and higher education as well as lifelong learning) are usually associated with concrete and immediate pay-offs in the labour market and could, therefore, justify a larger involvement of private actors (households and employers).

- **Finding appropriate resource allocation and budgeting mechanisms**. Public funds ought to be allocated carefully to promote better policy outcomes. However, prioritisation and budgeting procedures can be complex and give rise to major conflicts of interest. Sound mechanisms to prioritise skills investments and allocate public funds to execute them need to be responsive to a country's skills needs; should assess the cost and benefits of such investments; and generate trust among individuals and stakeholders. Optimal investment of resources in skills often involves reallocation of funds that have a limited impact; when this implies the transfer of funds between ministries or the elimination of policies, which although inefficient, may be popular or benefit certain stakeholders, political costs and conflicts of interest will arise.
- **Ensuring equity in funding considerations**. Government spending on skills investments is justified by the benefits at the aggregate level that arise when the population reaches higher levels of skills. Finding the right mix of public versus private funding requires an assessment of those potential benefits and a co-ordination effort to align the incentives of public and private actors so that country-specific balances in cost-sharing are widely recognised as fair and not preventing individuals from pursuing educational goals. Equity requires that funding is targeted to disadvantaged populations, or to urgent needs such as the reskilling and upskilling of adults at risk of losing their jobs.
- **Providing commensurate resources and management**. Evidence collected in the OECD National Skills Strategy Projects, and other OECD assessments, shows that there is often an imbalance between policy responsibilities and resource allocation. This may cause, in turn, a disconnection between policy design and policy implementation. Typically responsibilities are scattered over many different ministries, bodies or agencies, operating at different levels and with different organisational cultures. Also, some responsibilities are delegated to agents in the private sectors, such as non-governmental organisations, or to hybrid bodies or organisations, such as public-private partnerships.

In summary, skills systems are very complex given the multiplicity of actors. This complexity is increasing as traditional education systems evolve into lifelong learning systems and the diversity of actors increases. The lack of co-ordination between different actors within governments, between levels of government, and with stakeholders, is one of the main obstacles to the successful implementation of co-ordinated skills policies. Equally important are the definition and sharing of responsibilities, the implementation of accountability mechanisms, information systems and efficient funding arrangements. In addition, most skills reforms need to address serious conflicts of interests between different actors and keep the focus on improving the acquisition and use of skills by all sectors of the population. Thus, proper governance arrangements are becoming even more important for the success of skills policies.

The role of governments: New challenges and shared responsibilities

Megatrends are not only affecting our working and social environments, but they are also influencing the role of governments. Globalisation and digitalisation have led to the decentralisation of information, generated new, non-standard forms of work, facilitated the offshoring of certain parts of production processes, and have eliminated geographical barriers. In addition, demographic changes are putting significant pressure on public budgets. In many ways, the traditional roles of government are increasingly difficult to fulfil.

In most OECD Member countries, people expect a high-quality education in public schools and universities, believing these will lead to quality jobs for life. At the same time, many expect access to a free healthcare system and pensions when they retire.

However, the new dynamics imply that people in the future will be unlikely to have a job for life. They will have to reskill and upskill to move from one job to another as some jobs disappear and others emerge. The sustainability of traditional pension schemes is also in question. This new scenario may lead people to mistrust, feel fear or even anger at governments who are no longer able to provide them with the safety nets they expect.

The erosion of trust in governments represents a very serious risk that must be addressed. On the one hand, governments need to develop policies to address these challenges well in advance and minimise the risks. On the other hand, people must acquire the skills needed to transform these challenges into opportunities, to take more responsibility for their own learning and training, to adapt to a rapidly changing landscape, to become resilient so that they can overcome the fear of being left behind, and to hold reasonable expectations that buoy them above supporting over-simplistic, unrealistic solutions. In so doing, people will understand that they should not wait passively for changes to occur, but rather, that they are the architects of the future, that they can shape the trends in their societies, and that they play a very important role in defining how governments can help.

Chapter 2. Updating the OECD Skills Strategy

This chapter explains why the 2012 OECD Skills Strategy is being updated. It goes on to highlight what is new in the 2019 OECD Skills Strategy, including the revised OECD Skills Strategy framework, analysis of the skills implications of megatrends, a new OECD Skills Strategy Dashboard, and key policy findings and good practice examples for developing relevant skills, using skills effectively and strengthening the governance of skills systems. Finally, the chapter introduces the 2019 Skills Strategy framework, which has three core components: 1) developing relevant skills over the life course; 2) using skills effectively in work and society; and 3) strengthening the governance of skills systems.

The 2019 OECD Skills Strategy

Why is the OECD Skills Strategy being updated?

The OECD Skills Strategy aims to help countries achieve their economic and social ambitions by developing the right skills and ensuring that they are used fully and effectively. The strategy was presented to and endorsed by ministers at the 2012 Ministerial Council Meeting (MCM) [C/MIN(2012)4/FINAL]. As a horizontal initiative of the OECD, this strategy brings together the perspectives of all relevant committees and was prepared by a cross-directorate team led by the OECD Centre for Skills.

The OECD Skills Strategy was first made public in *Better Skills, Better Jobs, Better Lives* (OECD, 2012[1]). The report examined how countries could achieve better economic and social outcomes through a whole-of-government approach composed of three interrelated pillars: developing relevant skills, activating skills supply and putting skills to effective use.

Since 2013, the OECD Skills Strategy approach has "gone national" with the development of tailored national skills strategy projects carried out in close co-operation with inter-ministerial teams within countries. The OECD National Skills Strategy Project has supported countries in developing national skills strategies by building on comparative OECD data, analysis and policy insights (Box 2.1).

Box 2.1. OECD National Skills Strategy Project

The OECD National Skills Strategy Project has supported countries in developing national skills strategies by building on comparative OECD data, analysis and policy insights. Each project is designed to foster a whole-of-government approach, bringing a broad range of ministries together to better understand the country's goals for the future, identify the priority areas for action to improve the development and effective use of skills, as well as to design and align skills policies to achieve results. In addition, stakeholders are engaged in projects to improve understanding of the current skills challenges and opportunities; solicit their perspectives on what policy responses are needed; validate policy recommendations; and build support to take joint action to implement policies.

The foundation of this approach is the OECD Skills Strategy framework, which has been updated in this report. The three components of the 2019 OECD Skills Strategy are:

- developing relevant skills,
- using skills effectively, and
- strengthening the governance of systems.

The OECD Skills Strategy framework has demonstrated its value as a tool for assessing the performance of skills systems and generating recommendations for improving performance in a wide range of countries. To date, projects have been completed in ten OECD Member countries (Austria, Belgium [Flemish Community], Italy, Korea, Mexico, the Netherlands, Norway, Portugal, Slovenia and Spain) and one non-Member (Peru). In Norway, Portugal and Slovenia, the initial project was followed up by a second project that investigated a specific challenge identified in the first phase in greater detail, providing even more in-depth analysis and policy recommendations.

A number of factors important for success in building effective skills strategies have been identified by the OECD. These are listed in Box 2.2 below.

Box 2.2. Success factors for building effective skills strategies

In the course of working with 11 countries on projects to build effective national skills strategies, the OECD has identified a number of factors that can help to ensure success in developing and implementing skills strategies. These factors include:

- **A shared vision**. In all countries that the OECD has worked with, the challenge of responding to megatrends and harnessing their potential to improve the lives of citizens was a key impetus for embarking on a skills strategy project. By constructing a vision for how skills can help countries overcome challenges and seize opportunities, countries have been able to catalyse support across government and stakeholders for developing effective skills strategies.
- **A whole-of-government approach.** A great number of ministries across all levels of government have an impact on, and an interest in, skills outcomes. They include not just ministries of education and employment, but also ministries of economy, science and innovation, immigration, taxation and finance. Consequently, a key success factor for skills strategy projects is the formation of national project teams with representation from all skills-relevant portfolios. Building an understanding of how the success of policies in one domain can be influenced by the effective development and use of skills can be very important for enticing ministries to the table that might not otherwise perceive themselves as "skills ministries".
- **Stakeholder engagement.** Governments are not solely responsible for skills outcomes. Indeed, governments need the knowledge and political support of stakeholders to design and implement effective skills policies. This entails building strong partnerships with all actors in the skills system, such as employers, trade unions, training institutions, students and other stakeholders. The countries the OECD has worked with on skills strategy projects have worked to gain the support of stakeholders by engaging them in workshops and meetings in order to build a consensus about what are the most important skills issues facing countries, generate concrete policy recommendations, and build a commitment to take joint action to implement skills policies.
- **Strong evidence base.** A high-quality analysis of a country's skills performance is foundational to improving policies and outcomes. Countries participating in a national skills strategy have leveraged OECD international comparative data as well as other international and national data sources to help foster a consensus on what the most important skills challenges facing countries are and to develop policies that are grounded in evidence.
- **Leadership**. Leadership comes in many forms. Successful skills strategies emerge from inclusive national project teams with the participation of all skills-relevant portfolios at all levels of government. They are typically championed by a prime minister or by the minister responsible for the lead ministry. However, they also have senior level buy-in across all participating ministries. They demonstrate a willingness to be held publicly accountable for results by, for example, making the process of developing a skills strategy a transparent and open one. Successful national project teams are typically led by an effective project co-ordinator, who is

trusted and respected by colleagues in participating ministries, as well as by stakeholders. Finally, successful skills strategies have champions outside of government to build a shared commitment to act and to help sustain momentum across electoral cycles.

The enduring value of the OECD Skills Strategy, and the need for regular updates, was first confirmed by 26 ministers and under-secretaries from 15 countries and the European Commission at the 2016 Skills Summit (Røe Isaksen, 2016[2]):

> *We reaffirm the value of the 2012 OECD Skills Strategy as a useful framework for countries seeking to build effective national skills strategies and welcome the OECD's plans to regularly update the skills strategy to ensure that it reflects countries' experience with its use and continues to respond to their evolving needs. In particular, we would encourage the OECD to explore further what countries are doing to strengthen their skills systems. This work will help us to compare skills systems and develop a deeper understanding of what works.*

The importance of updating the OECD Skills Strategy to ensure its continued relevance was more recently affirmed by the OECD Education Policy Committee, the OECD Employment, Labour and Social Affairs Committee, as well as by the twenty-two countries that participated in the 2018 Skills Summit in Porto, Portugal.

What is new?

The 2019 OECD Skills Strategy takes account of:

- lessons learned from applying the OECD Skills Strategy framework in 11 countries
- new evidence about the implications of so-called megatrends, such as globalisation, digitalisation, population ageing and migration
- new evidence about skills policies that work.

In taking stock of the above, the 2019 OECD Skills Strategy introduces a number of improvements.

A revised OECD Skills Strategy framework

This chapter presents a revised OECD Skills Strategy framework (see the section, "The 2019 OECD Skills Strategy framework"). This revised framework responds directly to lessons learned from working with 11 countries to date. There are three main changes from the 2012 OECD Skills Strategy framework. The first two are important but relatively minor, whereas the third represents a more fundamental change.

First, in most countries with which the OECD has worked on national skills strategy projects, promoting a culture of lifelong learning has been a central preoccupation. As globalisation, technological change, demographic changes and other trends increase the demand for high levels of skills and at the same time require new and broader sets of skills, countries are seeking guidance on how to encourage and support adults to re-skill and up-skill throughout their lives.

In recognition of the increasing importance of lifelong learning, the "developing relevant skills" component of the 2012 OECD Skill Strategy has been renamed "developing relevant skills across the life course" in the 2019 strategy. Furthermore, the 2019 OECD

Skills Strategy identifies key policies aimed at: raising aspirations for learning and supporting informed learning choices; strengthening financing arrangements for lifelong learning; strengthening systems of skills validation and certification; and making lifelong learning accessible and relevant.

Second, government officials, social partners and other stakeholders in most countries the OECD has worked with have found that the distinction made in the 2012 OECD Skills Strategy between "activating skills supply" and "putting skills to effective use" to be artificial and even confusing. A number of these individuals has mentioned that since when skills are *activated* they are also *used* and vice versa, they are not distinct concepts. Many have noted that this conceptual confusion has led to time wasted trying to decide whether a given skills challenge relates to activating or using skills. In addition, some have commented that the concept of activation – a term normally associated with labour market policy – elevates the labour market utility of skills over their social utility. That is to say, making the activation of skills a distinct and, therefore, a prominent component of the strategy downplays the importance of the use of skills outside the workplace, including in voluntary work and home management. For all of these reasons, the 2019 OECD Skills Strategy combines the concepts of skills *activation* and *use* into a single component of the strategy: "using skills effectively in work and society".

Third, and most importantly, the importance of effective governance to improve policy coherence and complementarity was not formally recognised in the 2012 OECD Skills Strategy. However, governance matters have received considerable attention in all national skills strategy projects. Government officials, social partners and other stakeholders have noted that as skills policy lies at the intersection of education, labour market, industrial and other policy domains, it is an inherently complex policy domain. It implicates not only a great number of government ministries – not only ministries of education and employment but also ministries of economy, regional development, science, finance and many others – but often also multiple levels of government. Furthermore, the development and implementation of skills policy implicate a large and diverse range of actors in the educational arena (parental and student associations, teacher associations, educational institutions, etc.), labour market arena (trade unions, employers' associations, etc.), industry arena (sectoral groups) and many others.

It has been noted that this complexity – as well as the complex redistributive trade-offs that often go along with the distribution and redistribution of resources across ministries and levels of government – creates enormous political and technical challenges in designing and implementing effective skills policies. Good governance arrangements can help overcome these challenges by supporting co-ordination and collaboration across government; engaging stakeholders in the policy process; building integrated systems; and co-ordinating and aligning financing

The 2019 OECD Skills Strategy explicitly recognises the importance of governance by making the "strengthening governance of skills systems" a core component of the revised OECD Skills Strategy framework.

Analysis of the skills implications of megatrends

The skills implication of megatrends such as advances in technology, globalisation and the expansion of global value chains, ageing populations and migration flows have been a significant preoccupation among OECD Member countries. Since the publication of the OECD Skills Strategy in 2012, the OECD has embarked upon an ambitious agenda to better understand these trends and what they mean for the skills that are needed for

success in the economy and society, and for the policies that are needed to develop relevant skills and make effective use of those skills. Publications undertaken by the OECD since 2012 that are particularly relevant include: *OECD Skills Outlook 2019: Thriving in a Digital World* (2019[3])*; OECD Good Jobs for All in a Changing World of Work: The OECD Jobs Strategy* (2018[4]); *OECD Employment Outlook 2019: Future of Work* (2019[5]); *OECD Skills Outlook 2017: Skills and Global Value Chains* (2017[6]); and *OECD Getting Skills Right: Skills for Jobs Indicators* (2017[7]).

Despite this extensive body of research and analysis, government officials and social partners have remarked that their main messages cannot be easily located in a single source and that the combined impact of these trends has not been adequately explored.

The 2019 OECD Skills Strategy brings together the collective intelligence of the OECD to provide a concise summary (see Chapter 3) of the main skills implications of these megatrends. Analytical contributions were made by: the OECD Centre for Skills, the Directorate for Education and Skills; the Directorate for Employment, Labour and Social Affairs; the Directorate for Science, Technology and Innovation; the Economics Department; the Centre for Tax Policy and Administration; the Centre for Entrepreneurship, SMEs, Regions and Cities; the Public Governance Directorate; and the Development Centre.

New OECD Skills Strategy dashboard

Through its experience working with countries on national skills strategy projects, the OECD has developed a dashboard that helps countries to benchmark their performance internationally in the development (Chapter 4) and effective use (Chapter 5) of skills. The dashboard includes indicators of performance across three dimensions: level of performance (i.e. countries' average performance); trend in performance (i.e. assessing whether the performance is improving or worsening relative to other countries); and equity in performance (i.e. assessing the variation in skills outcomes across socio-economic groups).

The dashboard has been used effectively as a tool for facilitating discussion across government, social partners and other stakeholders about the strengths and weaknesses of countries' skills systems and, by extension, about policy priorities, trade-offs and synergies. In the most recent OECD national skills strategy projects, the dashboard has been employed as a tool to help identify the topics to be covered in detail in this volume's thematic chapters. The 2019 OECD Skills Strategy formally introduces this dashboard to the broader OECD skills policy community (in Chapters 4 and 5).

Key policy findings and good practice examples for developing relevant skills, using skills effectively, and strengthening the governance of skills systems

OECD Member countries – both those that OECD has worked with on national skills strategy projects and those it has not – frequently seek the OECD's guidance on skills policies that develop relevant skills and make effective use of those skills.

Since the publication of the 2012 Skills Strategy, the OECD has conducted a wide range of new analytical work and country studies with important policy messages. However, these policy messages are currently scattered across a wide range of OECD publications, including 14 OECD Skills Strategy publications. While it is well beyond the scope of a publication of this breadth and length to provide a comprehensive list of the OECD's

skills policy messages, the 2019 OECD Skills Strategy nonetheless highlights some of the key recurring policy messages found in its publications.

Finally, OECD Member countries frequently seek help from the OECD in identifying the skills policies pursued by other countries. This publication brings together 71 case examples from 30 countries to highlight the range of approaches being taken to develop relevant skills, use skills effectively and strengthen the governance of skills systems. Since a core tenet of the OECD Skills Strategy is that there is no such thing as one-size-fits-all policy, efforts have been made to provide examples from countries with different political systems, traditions and institutions, as well as from both centralised and decentralised systems of government.

By highlighting key skills policy messages and good practice examples from a wide range of countries, the OECD aims to facilitate peer learning, leading to better policies, better jobs and better lives.

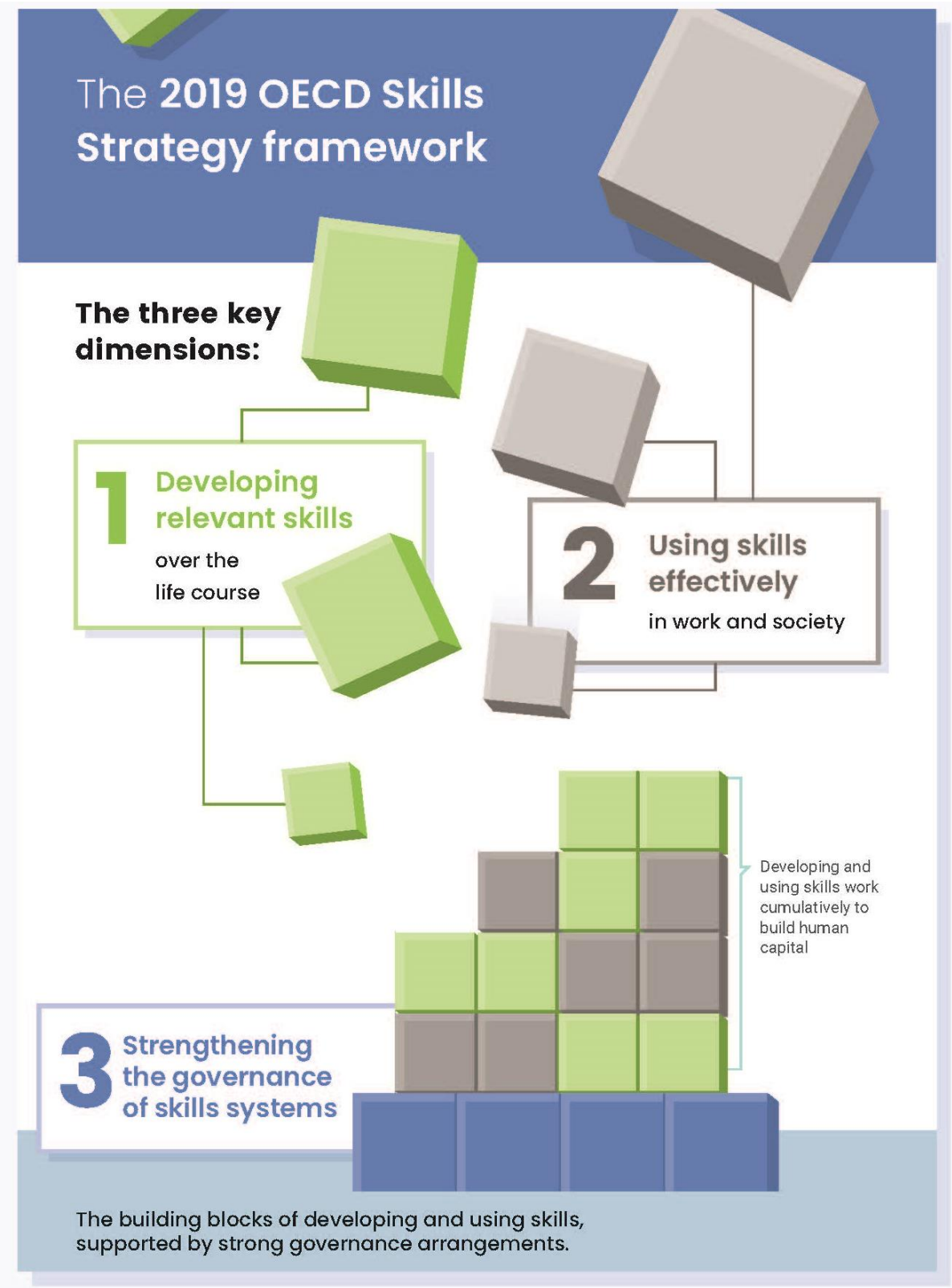
The 2019 OECD Skills Strategy framework

The 2019 OECD Skills Strategy provides countries with a comprehensive framework for analysing the performance of countries' skills systems, benchmarking performance internationally and exploring good practices internationally. To this end, the 2019 OECD Skills strategy framework identifies three key dimensions (Figure 2.1).

Developing relevant skills over the life course

To ensure that countries are able to adapt and thrive in a rapidly changing world, everyone needs access to opportunities to develop and maintain strong proficiency in a broad set of skills. This process is lifelong, starting in childhood and youth and continuing throughout adulthood. It is also life-wide, occurring not only formally in schools and higher education, but also non-formally and informally in the home, community and workplaces. By developing a strong supply of skills, countries also create incentives for firms to redesign their business models and practices to make greater use of the skills that are available to them (Box 2.3). The OECD Skills Strategy Dashboard, key policy messages and international good practice examples for developing relevant skills over the life course are presented in Chapter 4 of this report.

Figure 2.1. The 2019 OECD Skills Strategy framework



Box 2.3. Key policy lessons: Developing relevant skills over the life course

- **Raise aspirations for lifelong learning**: Set the vision and support informed learning choices.
- **Provide a good start for lifelong learning**: Build a strong foundation in early learning and formal education.
- **Make lifelong learning affordable and sustainable**: Strengthen financing arrangements for adult learning.
- **Make lifelong learning visible and rewarding**: Strengthen systems of skills validation and certification.
- **Make lifelong learning accessible and relevant**: Respond to the needs of individuals and employers.

Using skills effectively in work and society

Developing a strong and broad set of skills is just the first step. To ensure that countries and people gain the full economic and social value from investments in developing skills, people also need to use these skills fully and effectively. This means ensuring that people have opportunities to use their skills not only in workplaces but also in society through active engagement in civic and political life. It also means ensuring that people are able to use their skills to the fullest extent possible in each of these contexts. By using skills fully and effectively, people are also able to maintain and further develop their skills, making the development and use of skills a virtuous circle of success (Box 2.4). Chapter 5 presents findings from the OECD Skills Strategy Dashboard, key policy messages and international good practice examples for using skills effectively in work and society.

Box 2.4. Key policy lessons: Using skills effectively in work and society

- **Promote labour market participation**: Reduce barriers to work and help displaced workers to find new work.
- **Promote social participation**: Raise awareness of the benefits of civic engagement, and facilitate the use of skills in society and daily life.
- **Expand the pool of available talent**: Attract the right skills from abroad, improve transparency of skills and provide language training.
- **Make intensive use of skills in the economy**: Improve work organisation and management practices to make full use of employees' skills.
- **Reduce skill imbalances**: Improve the alignment between the supply and demand of skills.
- **Stimulate demand for high-level skills**: Support firms' innovative activities and remove obstacles to growth.

Strengthening the governance of skills systems

Implementing reforms is challenging for governments. The complexity of this task increases when policies involve a wide range of actors and entities, such as different levels of government and stakeholders, and cut across multiple policy areas, as is the case for skills policies. Governments often face enormous political and technical challenges, including the need to co-ordinate across different ministries and levels of government, to engage with stakeholders, and to define the financial and information aspects of inter-sectoral reforms, among others. Furthermore, inter-sectoral reforms are often associated with very complex redistributive trade-offs as they often go along with the distribution and redistribution of resources across and between sectors as well as levels of government. Thus, strong governance arrangements are needed to: promote co-ordination, co-operation and collaboration across the whole of government; engage stakeholders throughout the policy cycle; build integrated information systems; and align and co-ordinate financing arrangements. As technological change, globalisation, demographic changes and other megatrends combine to make it increasingly important to develop and make effective use of skills in adulthood, strong governance will be even more important for co-ordinating the activities and fostering collaboration across the many actors and entities that have an interest and role in ensuring that this happens (Box 2.5). The OECD's key policy messages, as well as international good practice examples for strengthening the governance of skills systems, are presented in Chapter 6.

Box 2.5. Key policy lessons: Strengthening the governance of skills systems

- Promote co-ordination, co-operation and collaboration across the whole of government.
- Engage stakeholders throughout the policy cycle.
- Build integrated information systems.
- Align and co-ordinate financing arrangements.

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Chapter 3. The skills implications of megatrends

This chapter explains how a number of megatrends, including technological change, globalisation and demographic changes are making skills more important than ever for success in today's world. It explores the combined implications of these trends, including their implications for the skills needed for success in the future; the imperative of a lifelong learning approach; the imperative of ensuring more equitable opportunities and outcomes; and the imperative of making better use of technology as a learning pathway.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The world is changing rapidly, transforming the skills needed for success in today's world

Megatrends, including advances in technology, globalisation, population ageing, and migration are combining to increase and transform the skills needed to thrive at work and in society. The skills countries invest in developing and how they use them can help overcome the challenges that these trends pose for economic growth and social well-being and, at the same time, help to take advantage of the opportunities many of these trends present for reshaping our world in a positive way.

Since 2012, the OECD has embarked upon an ambitious agenda to better understand these trends and what they mean for the skills that will be needed for success at work and in society, as well as for how and when skills can be best developed and used to advance countries' economic and social objectives. The present summary of the key skills implications of these megatrends has been informed by the following work undertaken by the OECD since 2012:

- The OECD Survey of Adult Skills
- OECD Going Digital project
- OECD Skills for Jobs Database
- 2018 OECD Job Strategy
- The Future of Work initiative
- OECD Innovation Strategy
- OECD Framework for Policy Action on Inclusive Growth.

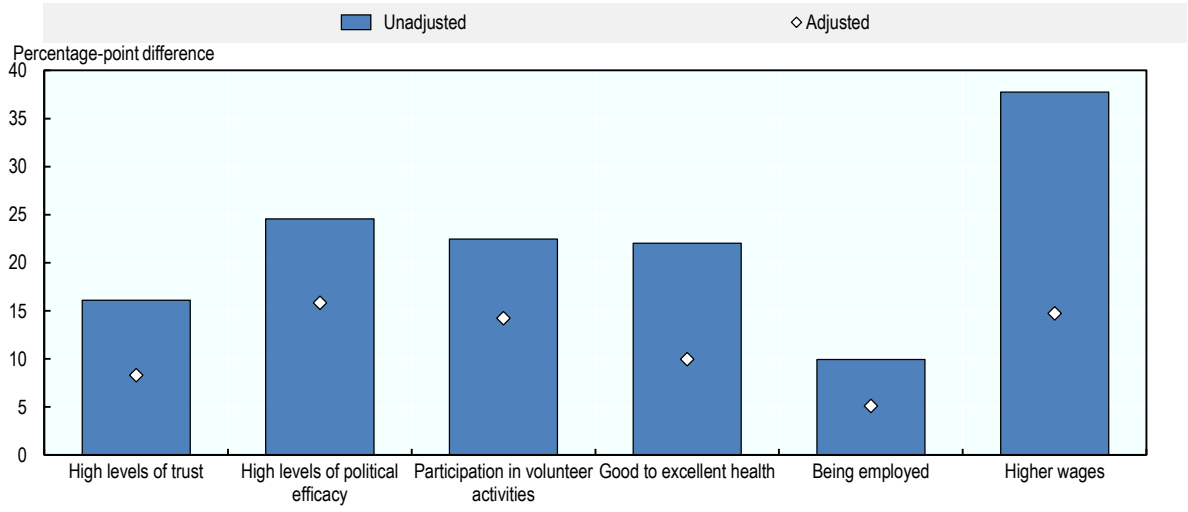
Megatrends are making skills more important than ever for economic success and social well-being

Developing the right skills and using them effectively is central to the economic success and well-being of individuals. Data collected through the PIAAC shows a high, positive correlation between skills and labour market outcomes. Adults with higher skills proficiency tend to have greater chances of being employed and, if employed, of earning higher wages (OECD, 2016[1]). Skills are also central to the capacity of individuals to participate fully in society, as well as to the cohesiveness of society itself. As shown in (Figure 3.1), more highly skilled people have higher levels of trust, participate more actively in the democratic process and in community life, and enjoy better health (OECD, 2016[2]).

Combined, megatrends are creating pressure for people to develop new and higher levels of skills, as well as to continue upskilling throughout life and to use their skills more effectively. Many of these same trends are also creating opportunities for people with the right skills to proactively transform our economies and societies for the better. The right policies can transform challenges into opportunities by equipping people with the skills needed to thrive in our increasingly interconnected and rapidly changing world.

Figure 3.1. Literacy proficiency and positive economic and social outcomes

OECD average, adjusted and unadjusted difference between the percentage of adults with high proficiency (Level 4 or 5) and the percentage of adults with low proficiency (Level 1 or below) who reported high levels of trust and political efficacy, good to excellent



Note:
1. All differences are statistically significant. Adjusted differences are based on a regression model and take account of differences associated with the following variables: age, gender, education, immigrant and language background and parents' educational attainment.
2. How to read this chart: Higher proficiency in literacy is associated with a greater likelihood of engaging in voluntary work. On average, chances of participating in volunteer activities are 22 percentage points higher among people who scored 4 or 5 than among those who scored at or below Level 1 in literacy. The relationship remains strong even after accounting for socio-demographic characteristics.
Source: OECD calculations based on OECD (2018[3]), *Survey of Adults Skills database (PIAAC) (2012, 2015)*, http://www.oecd.org/skills/piaac/.

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Digital transformation

Information and communications technologies (ICTs), advances in artificial intelligence (AI) and robotics are profoundly changing the way people work, communicate and live. Many people now regularly use digital tools such as computers, smartphones and tablets, both at work and in everyday life. In 2015, 57% of workers in the European Union (EU28) regularly used a computer or smartphone for work, a 20-percentage-point surge relative to a decade earlier (Eurofound, 2017[4]). Even for those who do not use ICTs at work, the nature of their work is changing as some tasks are automated. As governments go digital to improve effectiveness and efficiency, people need digital skills to access even basic public services.

Digitalisation brings immense economic potential. Digital technologies can generate productivity gains, spurring growth and creating new jobs. They can enrich the content of some occupations by allowing workers to increasingly focus on non-routine tasks, such as problem-solving and more creative and complex communications activities. Digital technologies can enable individuals around the world to bring their ideas into the marketplace much more easily, boosting opportunities for entrepreneurship. Digital technologies have also enabled the rise of the "platform economy", in which companies like Airbnb, Baidu, and Uber have introduced new ways to create value, work and socialise.

New technologies also have the potential to transform education systems and improve learning outcomes. Some new technology-supported, pedagogic models have shown to be effective in boosting collaboration, improving student engagement and motivation, and student skills (OECD, 2016[5]). Similarly, online-based platforms and laboratories facilitate the use of formative assessments and allow for targeted instruction while lowering the cost of access to education services. However, the connections among students, computers and learning are neither simple nor hard-wired (OECD, 2015[6]). Data from PISA show no appreciable improvements, on average, in student achievement in reading, mathematics or science in the countries that had invested heavily in ICT for education. More interestingly, there seems to be a weak connection between the acquisition of relevant digital skills, such as being able to filter relevant and trustworthy sources from among a large amount of information, and the intensity of use of the Internet at schools (OECD, 2015[6]).

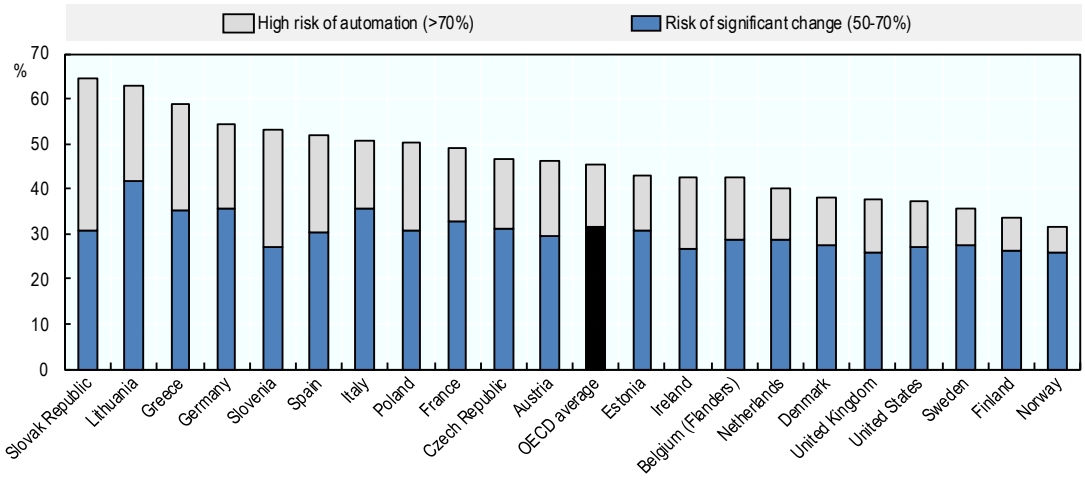
At the same time, there are fears about the consequences of digitalisation for labour market opportunities as well as for privacy and personal safety. The nature of many jobs will change, and many jobs may disappear as a result of automation. Digital technologies and media also facilitate the distribution of news of all kinds, including fake news, and expose us to the threat of information and identity theft, and youth across the globe to online bullying and harassment.

Implications of the digital transformation for the skills needed for economic success

OECD work building on PIAAC, suggests that, on average in the countries that participated in the survey, about 14% of workers face a high risk of seeing their jobs automated, and another 32% face significant changes in their job tasks due to automation (Figure 3.2) (Nedelkoska and Quintini, 2018[7]).

Figure 3.2. Cross-country variation in job automatability

Percentage of jobs at risk by the degree of risk



Note: High risk – more than 70% probability of automation; risk of significant change – between 50% and 70% probability.
Source: Nedelkoska, L. and G. Quintini (2018[7]), "Automation, skills use and training", http://dx.doi.org/10.1787/2e2f4eea-en.

StatLink https://doi.org/10.1787/888933927742

There are, however, significant uncertainties about the impact that technology will have on the skills needed for future jobs. Recent evidence shows that the gap between what is required at work and what machines can deliver is shrinking. For instance, 62% of workers in OECD Member countries use literacy skills at work on a daily basis, but at a level that computers are already close to reproducing (Elliott, 2017[8]).

Estimates of the number of *potentially* automatable jobs may not correspond to the number of jobs that *will* be automated, as the decision to adopt this type of labour-saving technology depends on a variety of factors, including economic, legal, ethical and social considerations, as well as on the availability of the skills needed to work with technology.

If anything, the skills required in emerging jobs are not the same as those demanded in jobs that are disappearing. Recent evidence from the *OECD Skills for Jobs* database (Box 3.1) (OECD, 2017[9]) shows that the labour market demand for high-cognitive skills such as written and oral expression, reasoning and complex problem solving has increased in the last decade, while demand for routine and physical abilities has dropped significantly (Figure 3.3).

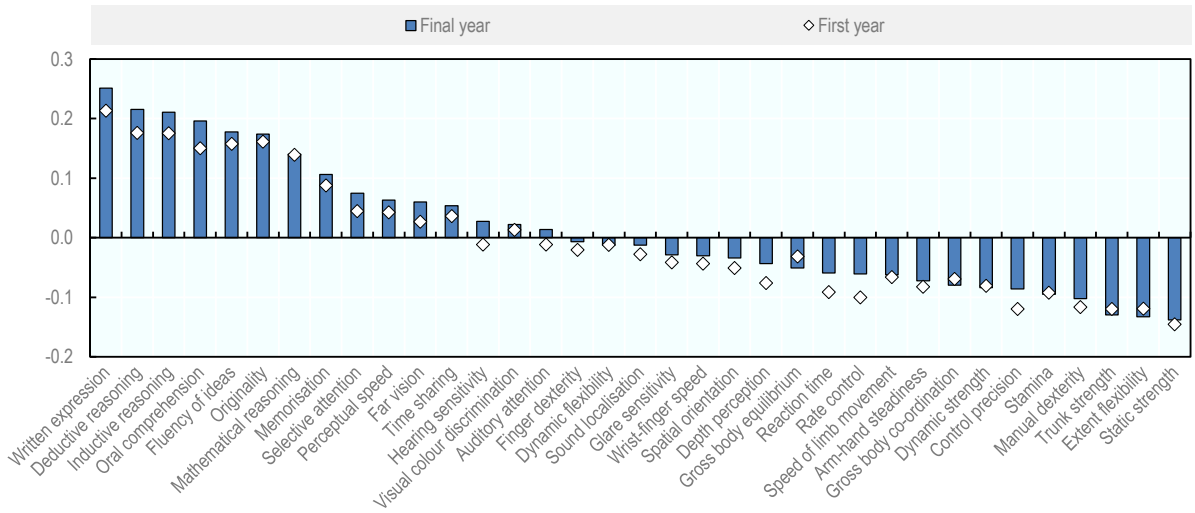
Box 3.1. *OECD Skills for Jobs* database

The *OECD Skills for Jobs* database is a key instrument for assessing and anticipating skill needs. It documents the evolution of skills imbalances in terms of shortages and surpluses. To this end, the *OECD Skills for Jobs* database makes use of detailed performance indicators by occupation and a taxonomy of skill requirements by occupation. The degree of "labour market pressure" for each occupation in each country is assessed by five performance measures, which compare an occupation's long-term path in terms of wages, working time, employment, unemployment and under-qualification with the country average. Above-average performance on each of these outcomes is interpreted as a signal of occupational shortage whereas below-average performance is interpreted as a signal of occupational surplus. After standardising the five relative performance measures, they are aggregated into a single index of occupational imbalance for each occupation. In a second step, the occupational imbalance index is mapped to the underlying skills requirements associated with each occupation based on a widely-used taxonomy (O*NET) and aggregated to the country level.

Source: OECD (2018[10]), *OECD Skills for Jobs* (database), www.oecdskillsforjobsdatabase.org.

Figure 3.3. Evolution of skills demand, 2004-17

OECD Skill Needs Indicator (OECD average)



Note: Skills are ordered by the magnitude of imbalance in the final year (unweighted OECD average). The first year is 2004 or closest available year; the final year is 2017 or closest available year. A positive value indicates a skills shortage and a negative value indicates a surplus. A value of positive (negative) 1 corresponds to the maximum skill shortage (surplus) observed across OECD Member countries and skills dimensions.
Source: OECD (2018[10]), *OECD Skills for Jobs* (database), https://www.oecdskillsforjobsdatabase.org/.

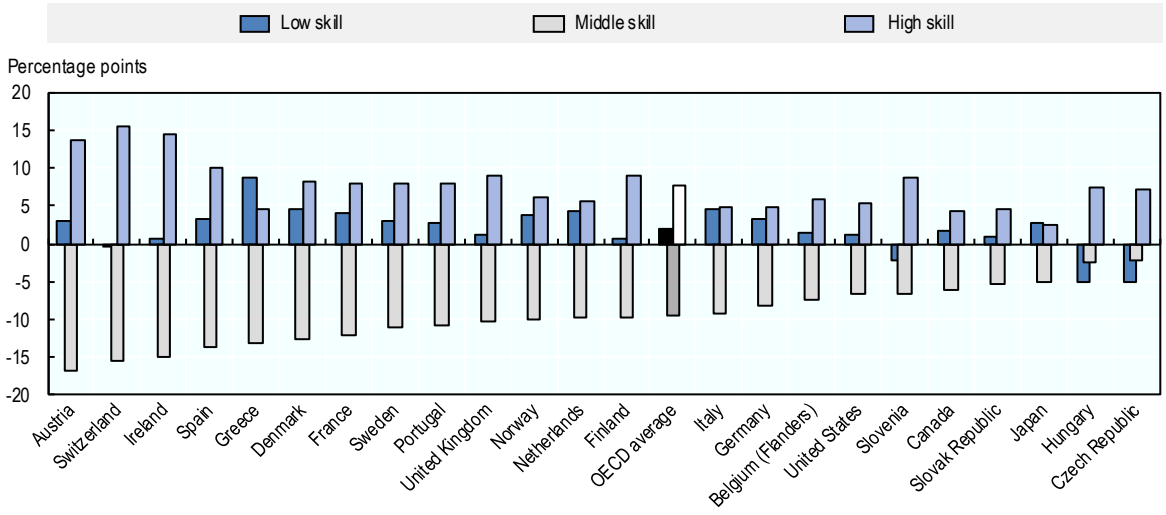
StatLink https://doi.org/10.1787/888933927761

The changes in skills demand brought about by digitalisation create opportunities for some workers while making others vulnerable. Highly skilled workers are more likely to benefit as their skills complement technology and they can perform non-routine tasks. Conversely, those with low levels of skills are more likely to be employed in jobs that are vulnerable to automation and also face increasing competition from middle-skilled workers whose jobs have been most affected by the digital transformation (Green, forthcoming[11]).

As a result, many countries have experienced labour market polarisation in the past two decades – a situation in which the share of employment in high-skilled, and to some extent in low-skilled, jobs has increased, as the share of employment in middle-skilled jobs has decreased (Figure 3.4) (OECD, 2017[12]).

Figure 3.4. The labour market continues to polarise

Percentage point change in the share of total employment, 1995 to 2015



Source: OECD (2017[13]), *OECD Employment Outlook 2017,* Figure 3.A1.1. Job polarisation by country, http://dx.doi.org/10.1787/888933477940.

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The digital transformation may also exacerbate inequalities between cities/regions, as new jobs are not necessarily created in the same places where jobs have been destroyed. Evidence from the United States shows that new jobs making high use of computers since the 1980s have mainly appeared in urban areas, which tend to have a large share of highly skilled workers (Berger and Frey, 2016[14]). At the same time, technology facilitates the adoption of work practices that take advantage of ICT, such as remote working.

Implications of the digital transformation for the skills needed to increase well-being

ICT is more than an infrastructure that can facilitate access to information and to private and public services. It affects the way people interact, communicate, obtain information, learn, buy goods, participate in the democratic process, and spend their leisure time. E-commerce affects consumers' behaviour and use of time and is changing the retail industry. The time that people spend on their smartphones and the implications that this may have on their social life and well-being have now become crucial questions.

As a result, it is becoming critical that individuals develop adequate skills to access, filter and process information, to perform the tasks that can be done via the Internet and to benefit from the new opportunities offered by the digital era. At the same time, heightened awareness is needed to protect individuals' privacy by securing their data. If people have the necessary skills, digitalisation offers large potential for knowledge diffusion, and for enhanced engagement in the public good, including political engagement and public services.

Skills are becoming a major determinant of the digital divide. As Internet access has expanded to a large share of the population, the digital divide is increasingly characterised by the type of activities that citizens are able to perform on the Internet and the outcomes of Internet use, for instance in terms of security, privacy and well-being. These outcomes are mainly driven by the skills people have (Scheerder, van Deursen and van Dijk, 2017[15]).

Young people, more than others, lead in the use of digital tools. On average across OECD Member countries in 2015, students were spending more than two hours on line during a typical weekday after school, and more than three hours on line during a typical weekend day (OECD, 2017[16]). Digital technologies can assist youth in developing and expanding their personal relationships and networks. Participating in social networks was found to be the most popular online leisure activity among teens across OECD Member countries, followed by chatting on line (OECD, 2017[16]). More than half of girls and boys aged 15 said they feel bad when no Internet connection is available. While technology can be beneficial, it can also expose youth to dangers such as online bullying and harassment.

Skills policies can help all individuals benefit from digitalisation in their everyday life at a time when the misuse of digital tools can jeopardise human relationships and even hurt democracy.

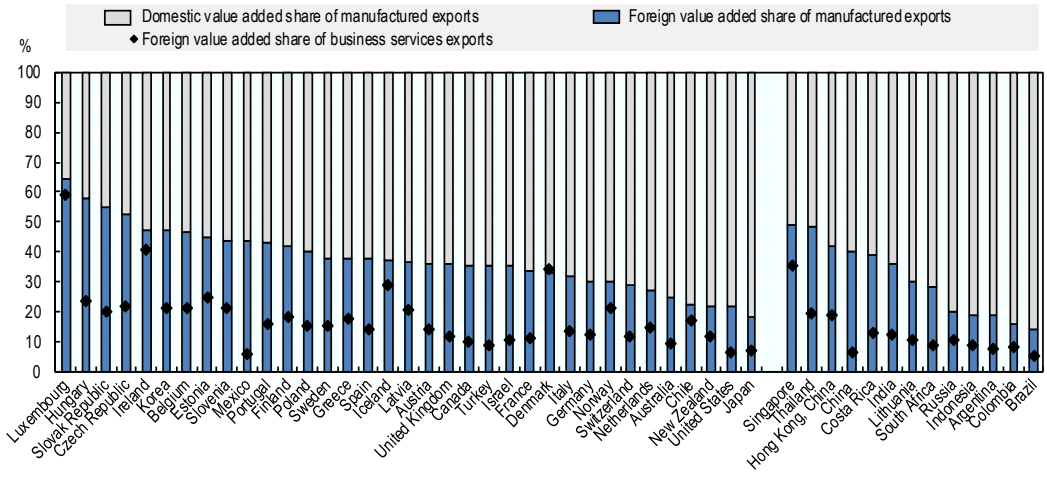
Globalisation and global value chains

Since the 1990s, the world has entered a new phase of globalisation. Information and communication technology, trade liberalisation and lower transport costs have enabled firms and countries to fragment the production process into global value chains (GVCs), with products designed in one country, manufactured in another, and assembled in yet another. In order to seize the benefits of GVCs, countries have to implement well-designed policies that develop the skills their populations need to thrive in this new era.

The scale of GVC deployment is significant, as is evidenced by trade in value-added terms, which distinguishes the value of exports that is added domestically from that which is added abroad. On average, in OECD Member countries, close to 40% of the value of manufactured exports and 20% of the value of business services exports comes from abroad (Figure 3.5).

Figure 3.5. The incidence of global value chains, 2011

Foreign value-added embodied in exports of manufactured goods and exports of services



Source: OECD (2015[17]), *OECD Trade in Value Added (TiVA)* database, https://stats.oecd.org/index.aspx?queryid=66237.

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GVCs provide workers with opportunities to apply their skills internationally and firms with the possibility to engage in production processes they might be unable to undertake on their own. As a consequence, the demand for some skills may decline as certain tasks and activities are offshored, exposing workers to wage moderation, decreases or even unemployment in the short term. In the long term, however, offshoring enables firms to reorganise and achieve productivity gains that can lead to aggregate job creation.

Digitalisation has tended to amplify participation in GVCs and has contributed to shaping skill demands by allowing for the segmentation of tasks facilitating their offshoring. At the same time, the combination of increasing global integration and digitalisation is boosting opportunities for entrepreneurship.

Implications of GVCs for the skills needed for economic success

The costs and benefits of GVCs are complex. GVCs increase the interconnections between countries and thereby the uncertainty surrounding the demand for skills. A country's competitiveness can be affected by skills policy changes occurring among its trading partners, increasing the uncertainty around how skills demands are evolving. In this context, it is of paramount importance to build responsive skill assessment and anticipation (SAA) systems that enable countries to react to changing labour market and skills demands (OECD, 2016[18]).

Participation in GVCs can lead to productivity gains, but potential gains are dependent on a country's skills endowment (OECD, 2017[12]). Countries' skills endowments and skills-related policies can shape their specialisation in GVCs and their opportunities to specialise in sophisticated industries, such as complex business services and high-tech manufacturing industries.

In addition, investing in skills (and in systems to anticipate changing skill demands) can safeguard against the potential negative impact of GVCs on employment and inequality for at least three reasons:

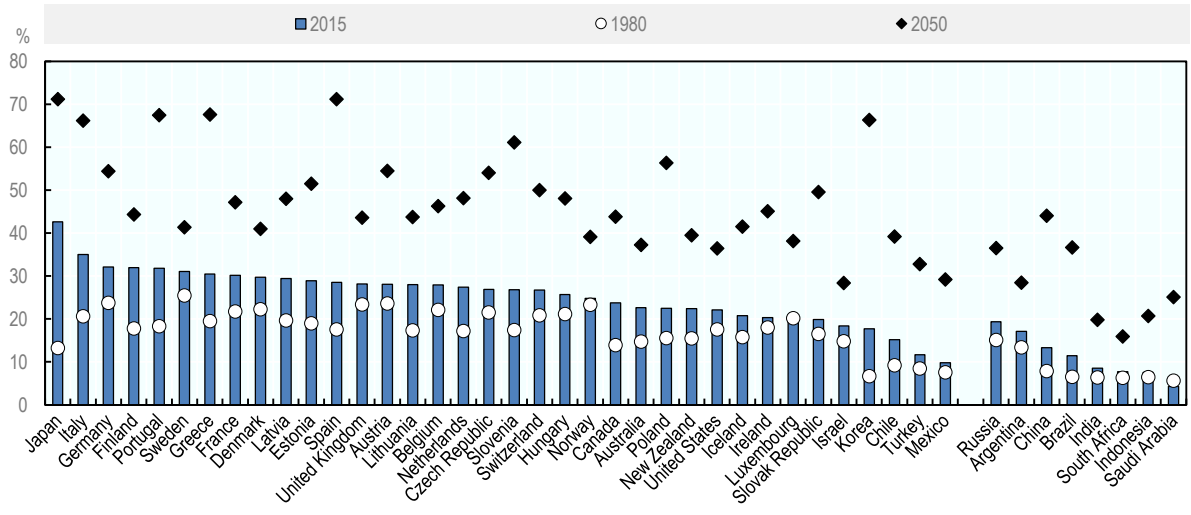
- High-skilled jobs are less exposed to the risk of offshoring, although this is becoming less and less the case.
- Using certain types of skills on the job (e.g. those associated with non-routine tasks and tasks involving face-to-face contact) make workers less vulnerable to offshoring.
- Developing the skills of workers in small and medium-sized enterprises helps these firms to connect with multinationals and benefit from global value chains.

Population ageing

Declining fertility rates and increasing life expectancy are leading to population ageing in many OECD Member countries. Figure 3.6 shows that the old-age dependency ratio (the ratio of older people to the working-age population) is expected to increase significantly by 2050 in most OECD Member countries, shifting the composition of the workforce from young to older workers (OECD, 2017[19]).

Figure 3.6. Population ageing, 1980-2050

Old-age dependency ratio: Population aged 65 and over, relative to population aged 15-64



Source: United Nations (2018[20]), *World Population Prospects: The 2017 Revision*, https://population.un.org/wpp/Download/Standard/Population/.

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According to recent projections, these demographic developments will reduce living standards in many OECD Member countries (Guillemette and Turner, 2018[21]). First, between 2018 and 2030, increases in the old-age dependency ratio are estimated to subtract about a ¼ percentage point from gross domestic product (GDP) per capita growth in the OECD. Second, population ageing is also a drag on the aggregate employment rate (employment as a percentage of the population of working age) because

older people tend to have lower employment rates than middle-aged people. Third, population ageing will also require higher investment in healthcare and pensions systems, creating financial pressure on other policy areas, such as those relating to skills development and use.

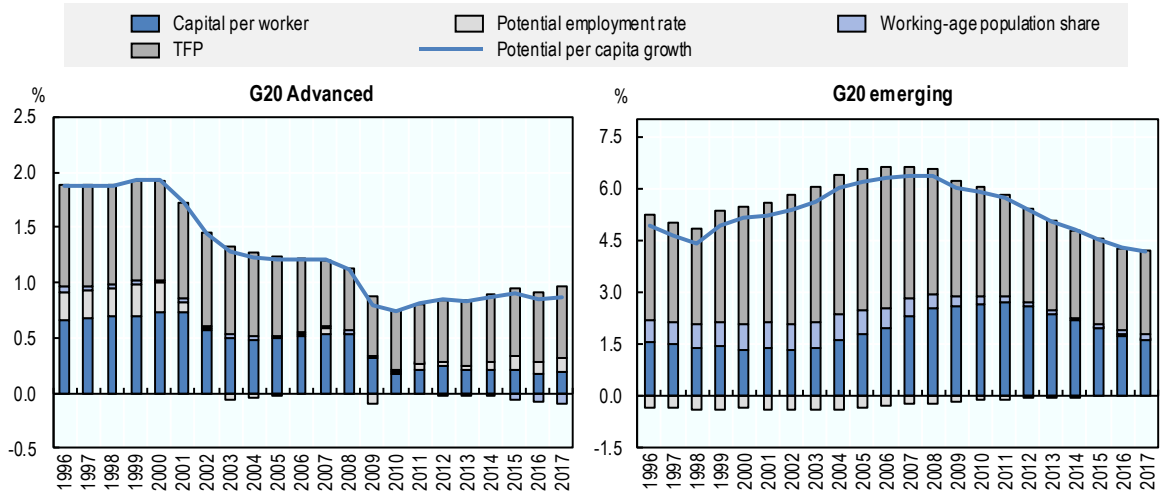
These demographic changes will make it important to invest in the skills of the present and future workforce. Replacement demands are likely to be a key source of job opportunities in most OECD Member countries in the next decade as a large cohort of baby boomers will retire, and shortages of qualified labour may arise. At the same time, the decrease in the total size of the labour force will need to be offset by an increase in productivity. This will provide further impetus for ensuring that people develop skills that match the needs of occupations in demand as well as those skills that promote productivity and innovation.

An ageing society may also result in changes in consumer preferences, leading to an important reallocation of labour and resources across sectors and occupations - particularly away from durable goods and towards services. This will have implications, too, for the skills that are in demand in the labour market.

Implications of population ageing for the skills needed for economic success

With an ageing population, economic growth will depend more heavily on productivity growth and on raising labour force participation rates, particularly among women and older workers. Productivity gains, which are a central driver of long-term improvements in living standards, have slowed in many advanced economies over recent decades. More recently, this slowdown has extended to emerging economies (Figure 3.7).

Figure 3.7. Contribution to potential output growth per capita in G20 advanced and G20 emerging countries, 1996-2017



Note: G20 advanced countries include Australia, Canada, France, Germany, Italy, Japan, Korea, United Kingdom and the United States. G20 emerging countries include Argentina, Brazil, People's Republic of China (hereafter "China"), India, Indonesia, Mexico, Russia, South Africa and Turkey. Decomposition based on a Cobb-Douglas production function, using the population aged 15-74 years. The productive capital stock excludes housing investment.
Source: OECD (2018[22]), *OECD Economic Outlook* (database), http://stats.oecd.org/Index.aspx?DataSetCode=EO and OECD calculations.

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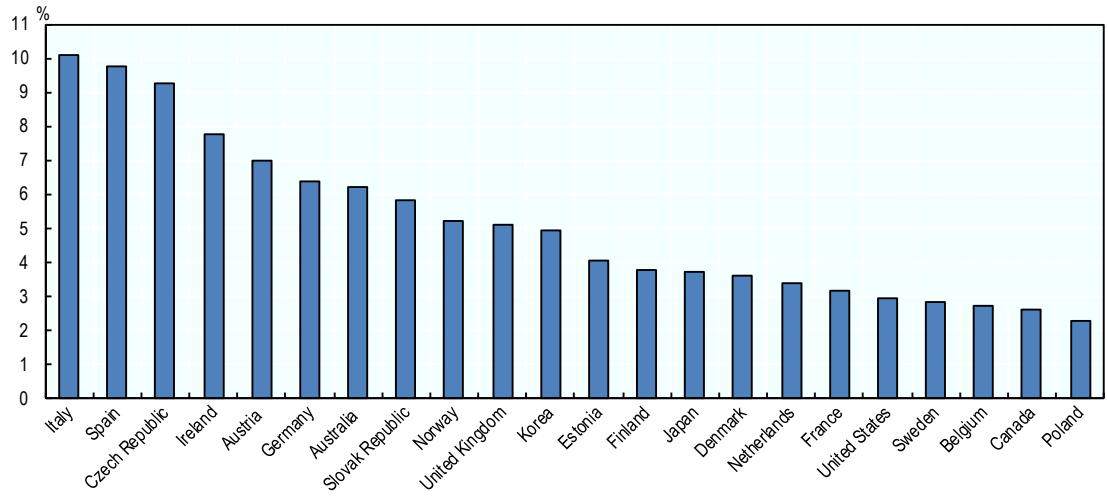
Raising productivity growth is highly dependent on a country's ability to innovate and adopt new technologies, which requires a supply of highly-skilled talent. More highly skilled workers tend to be more productive and make it easier for firms to introduce and disseminate productivity-enhancing technologies and new ways of working (Hanushek and Woessmann, 2010[23]; OECD, 2011[24]). While the inflow of highly educated workers into the labour market has significantly boosted labour productivity over the past 50 years, the rate of increase in the stock of human capital is projected to slow (Braconier, Nicoletti and Westmore, 2015[25]). In this context, the ability of economies to upgrade the skills of the existing workforce and efficiently deploy the existing stock of human capital will become increasingly important. Longer working lives will also increase the importance of lifelong learning. Skill policies will need to provide equal opportunities for workers to upgrade their skills, especially for low-skilled and older workers, and better recognise skills acquired over the life course.

Aggregate productivity performance depends not only on the level of skills but also on the match between demand and supply of skills, as a worse match leads to a less efficient allocation of resources. Significant gains in labour productivity can be achieved through the more efficient matching of worker skills with the skills needed for jobs (Adalet McGowan and Andrews, 2015[26]). Reducing skills mismatch expands the effective pool of labour that firms can draw workers from, enabling them to innovate and grow (Figure 3.8). Policies to better match skills will be crucial to take full advantage of technological advances and raise productivity growth.

Figure 3.8. Counterfactual productivity gains from reducing skills mismatch in selected countries

Simulated gains to allocative efficiency from lowering skills mismatch to the best practice, %



Note: The chart shows the difference between the actual labour productivity and counterfactual labour productivity based on lowering the skills mismatch in each country to the best-practice level. 1-digit industry level mismatch indicators are aggregated using a common set of weights based on the industry employment shares for the United States. The estimated coefficient for the impact of mismatch on productivity is based on a sample of 19 countries for which both firm-level productivity and mismatch data are available.
Source: Adalet Mcgowan, M. and D. Andrews (2015[26]), "Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data", https://doi.org/10.1787/5js1pzx1r2kb-en.

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Implications of population ageing for the skills needed to increase well-being

Population ageing will have implications for the skills needed in the economy and the skills the elderly will need to participate effectively in society. The slowing growth of human capital is creating pressure to ensure that more people develop the high levels of skills that are in demand and that will be needed to drive productivity.

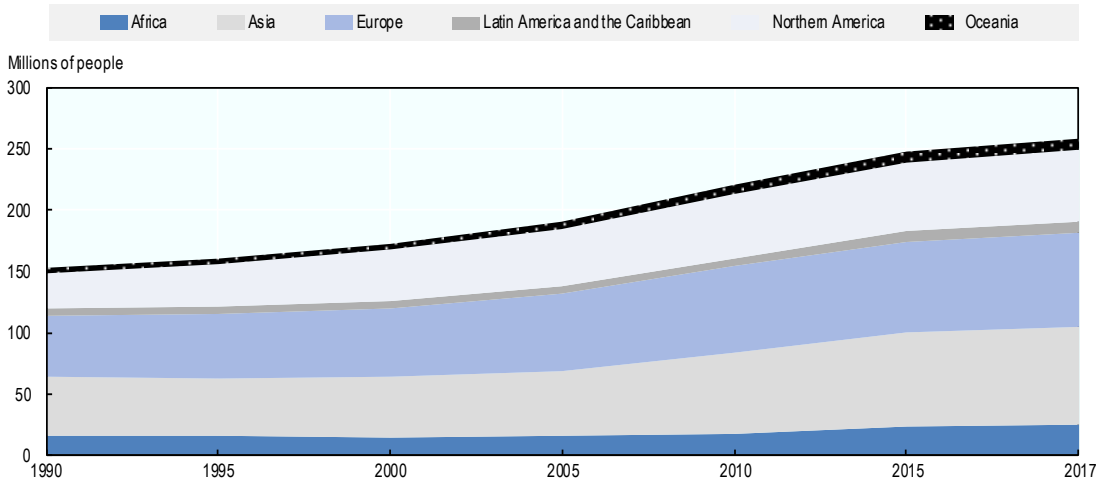
An ageing population will increase demand for certain products and services – such as healthcare and personal services – that will facilitate the well-being and social participation of an ageing population. This will, in turn, affect the types of skills that will be needed in the labour market.

Increasing longevity will mean increasing demand among the elderly themselves to develop skills that allow them to participate fully in society, such as digital skills that facilitate social engagement and access to basic public services in a digital world.

Migration

Migration flows have been rising over the past few decades and are unlikely to fall from their current levels, given the large demographic and economic imbalances as well as ongoing conflicts and climate change. In 2017, about 258 million people around the world were living outside their country of birth, and about half of all these migrants were living in OECD Member countries (OECD, 2018[27]). Growth in migration has been rapid. Between 1990 and 2017, the total number of international migrants increased by 69% (Figure 3.9) (OECD, 2019[28]).

Figure 3.9. Estimates of international migrant stock by region of destination, 1990-2017



Note: Northern America includes Bermuda, Canada, Greenland, Mexico, Saint Pierre and Miquelon and the United States.
Source: United Nations (2017[29]), *International migrant stock* (database), Variable POP/DB/MIG/Stock/Rev.2017; published in OECD (2019[28]).

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Within the group of foreign-born, refugees are an important and growing group in many countries. Many are struggling to integrate successfully into the labour market and society.

Migration results in more diverse societies and has important economic implications. Migration typically boosts the working-age populations and migrants can contribute to long-term economic growth and technological progress. A precondition for this to happen is that their skills are well used.

Implications of migration for the skills needed for economic success

Migrants are increasing the supply of skills in many destination countries. The number of migrants with tertiary education in OECD Member countries increased by 70% between 2000 and 2010. This increase is much larger than that for the native-born population (OECD, 2017[12]). On the other hand, there are concerns that some migrants do not have the expected skill levels based on the credentials they hold, and this has been supported by empirical evidence (Sharaf, 2013[30]; Li and Sweetman, 2013[31]).

Migrants can fill important niches in both fast-growing and declining sectors of the economy (OECD, 2014[32]). Migration can help to boost innovation and spur economic growth. Migrants are also found to be more entrepreneurial than native-born citizens. Across the OECD, 12% of employed immigrants are self-employed, a share that is higher than among the native-born (OECD/EU, 2018[33]).

Migrants can also bring new ideas and networks to their new countries. A study from the United Kingdom found that companies with foreign-born owners are more likely to introduce new products and services and to sell to the international market than firms with only UK-born owners (Nathan and Lee, 2013[34]). Furthermore, by removing informational and cultural barriers between their old and new countries, they can create new opportunities for trade and stimulate foreign direct investment (OECD, 2017[12]).

Some countries, especially in Eastern Europe, are losing significant numbers of skilled people to countries with better employment opportunities in Western Europe and elsewhere. This is exacerbating the skills pressures of the rapidly ageing populations in the former countries. As a result, while some countries are experiencing skills deficits exacerbated due to out-migration, other receiving countries are recipients of a skills dividend.

At the same time, many OECD Member countries – especially those in Europe – have been receiving large numbers of relatively unskilled migrants. This is happening at the same time as the skills needs of these economies are generally increasing. Many of the countries that had received many low-skilled labour migrants prior to the global economic crisis – such as Greece, Italy and Spain – now have large numbers of low-skilled adults who are unemployed. Low-skilled immigrants were particularly hard hit, raising questions of employability.

Implications of migration for the skills needed to increase well-being

Well-functioning schools can help young immigrants and refugees to understand, adapt to and embrace their new societies (OECD, 2018[27]). Conversely, without support and leadership, schools can compound divisions and increase marginalisation and alienation. For migrant adults, targeted adult-learning systems are needed to help them acquire new languages and other skills that will allow them to be productive and engaged members of society.

Understanding the impacts of migration is important to shape debates about the role of migration in society in a constructive way. Such debates, in turn, are essential to design policies in areas like education and employment that maximise the benefits of migration,

especially by improving migrants' employment situations (OECD, 2014[32]). For example, structures for assessing and recognising migrants' skills are important for migrants to find jobs that are well matched with their skills and thereby facilitate their successful integration.

Megatrends have a number of important implications for the skills countries need in the future as well as for how skills are distributed, developed and used

Skills for the future

In a world characterised by rapid change and uncertainty, governments, individuals, firms and trade unions will all need to take greater responsibility for ensuring that people learn and develop their skills throughout life. Greater commitment to learning will safeguard individuals' employment and participation in society. Developing a broad set of knowledge, skills, attitudes and values will allow individuals to be competent workers and engaged citizens. Governments can play an important role in promoting lifelong learning to reduce the inequalities of opportunities throughout life.

Building effective skills entails the mobilisation of knowledge, competencies, attitudes and values to meet complex demands. Among the knowledge, competencies, attitudes and values that will be increasingly key to success in work and life are:

- **Foundation skills**, including literacy, numeracy and digital literacy that will have to be mastered at a high level in order for people to adapt to changes in their jobs and in society. Equipped with strong foundation skills, people will be better positioned to acquire new knowledge and develop other skills, such as analytical, social and emotional skills, and will be prepared to continue learning throughout life.
- **Transversal cognitive and meta-cognitive skills** such as critical thinking, complex problem solving, creative thinking, learning to learn and self-regulation are needed not only to respond to the challenges of the future but also to reshape the future for the better.
- **Social and emotional skills** such as conscientiousness, responsibility, empathy, self-efficacy and collaboration that help make for kinder, gentler and more tolerant societies.
- **Professional, technical and specialised knowledge and skills** needed to meet the demands of specific occupations, but also, with sufficient transfer potential to be applicable in new, yet unknown fields.

Most skills systems – including not only formal education, but also non-formal and informal learning in homes, communities and workplaces – find it difficult to prepare students for the future in a world that is highly unpredictable, especially as routine cognitive skills are becoming easier to automate, yet continue to be widely taught across education systems.

Equipping students with a broad range of competencies necessary for a changing world is another key concern in OECD Member countries. The Education 2030 project highlights current efforts to identify "transformative competencies" that will address the need for young people to be more innovative and responsible in a complex world, as well as ways to embed these competencies in school curricula (OECD, 2018[35]).

The imperative of a lifelong learning approach

The rapid pace at which the world of work and societies are changing is pushing countries to redefine the objectives of skills policies and their contribution to the development of skills of individuals over the life course.

Traditionally, education consisted of one period during childhood and youth in which most skills were acquired and specialisation was achieved. Following this period, people marginally improved their skills in the workplace through formal, non-formal and informal learning. This model is increasingly untenable in a world of rapid technological, economic and societal changes where individuals are required to *learn how to learn* and adjust to an ever-changing landscape. Adult learning becomes of paramount importance.

Taking part in adult learning provides individuals with the opportunity to upskill and reskill in line with changing labour market demands. Yet, according to data PIAAC, only 41% of adults in the surveyed OECD Member countries participate in formal or non-formal adult learning in any given year. Moreover, those adults who would benefit most from education and training, such as those with low skills, the long-term unemployed and those whose jobs are at high risk of automation are least likely to participate. Another important group often under-represented in adult learning is that of individuals in non-standard forms of employment: own account, temporary as well as part-time workers. Ensuring broad-based participation in adult learning must top the agenda of governments, employers, social partners and adult-learning providers who want to shape a future of work that is both more productive and inclusive.

So far, very few countries have implemented effective lifelong learning policies and *de facto* most of them have targeted mainly highly skilled adults. Engaging the 59% of adults who currently do not participate in education and training is a major task for all stakeholders involved, as the vast majority of them have no interest or motivation to do so. Across OECD Member countries participating in the PIAAC survey, 48% of adults neither participate nor want to participate in adult learning in any given year. With adult learning being one of the key levers to prepare the workforce for changing skill needs, it will be crucial to find effective ways to motivate this part of the population to take part in education and training. The lack of motivation is particularly strong for the low-skilled and is likely to be due to a mix of poor attitudes to learning, lack of understanding of the benefits that can derive from training and the perception that existing barriers to participation are insurmountable.

Better policies are needed to foster new governance models, information management and funding arrangements that take into account the role of different actors, giving greater consideration to non-traditional institutional providers and learning environments. Policy efforts must also focus on those individuals who want to take up (further) adult learning opportunities, but face a variety of obstacles in doing so. On average, 33% of people who take part in job-related adult learning want to pursue further learning opportunities but do not for different reasons. Equally, 11% of people who do not take part in job-related adult learning would actually want to take part in learning opportunities.

Finally, with much learning taking place in and through the workplace, the engagement of employers in the design, implementation and financing of skill development opportunities is critical to the success of adult-learning systems. Involving small and medium enterprises in these systems is particularly important, as they constitute the vast majority of businesses around the world, but this is also a challenge given their more limited capacity to plan, fund and deliver training.

Turning education systems into lifelong learning systems requires a shift from front-end loaded models of education – i.e. ones that focus mainly on primary, secondary and tertiary education – towards learning models that also invest considerably in early childhood education and care and adult learning.

The importance of and means for adopting a lifelong learning approach is discussed in greater length in Chapter 4 on developing relevant skills over the life course and Chapter 6 on strengthening the governance of skills systems.

The imperative of creating more equitable opportunities and outcomes

Unequal skills outcomes across population groups are an important driver of inequality and undermine social cohesion (OECD, 2015[36]). Evidence from PISA and PIAAC data shows that differences in socio-economic status contribute to the widening of gaps in skill proficiency between ages 15 and 27, particularly among low achievers (Borgonovi et al., 2017[37]).

When poor outcomes are concentrated among certain groups, such as individuals from low socio-economic backgrounds and immigrants, social marginalisation and tensions can result. Having high average levels of skills is not in itself "good enough" as it may hide underlying differences between groups. It is essential to actively pursue equity and quality in education and skills achievement to ensure that everyone can participate fully in the economy and society. As all international surveys show, these goals are not mutually exclusive (OECD, 2013[38]; OECD, 2016[1]).

Reducing gender disparities in skills outcomes

Policies aiming to reduce inequalities in opportunities among children and schools are important to ensure that all young adults are equipped with the skills they need for successful careers, enabling them to embrace the impact of technology in a changing world of work. These policies must target the most vulnerable groups in our societies: early school leavers; those not in employment, education or training (NEETs); unemployed youth; the long-term unemployed; and adults with low levels of skills. Addressing the barriers to adult learning, especially for low-skilled individuals, requires working on various fronts such as increasing incentives for investments in training, developing mechanisms to allow the portability of training rights between employers, fostering motivation and removing time and other constraints.

The gender dimension deserves particular attention. The 2013 OECD Recommendation of the Council on Gender Equality in Education, Employment and Entrepreneurship recommends promoting gender equality in education outcomes by ensuring boys and girls have equal access to good-quality education, equal rights and opportunities to successfully complete schooling, and in making educational choices (OECD, 2017[39]).

Evidence from PISA 2015 highlights that boys and girls now show similar proficiency levels in science. However, gender differences in boys' favour emerge among the highest achieving students, while girls are generally less likely to appear amongst the lowest achieving students. These differences come on top of gender disparities, once again in favour of boys, in mathematics performance among the highest achieving students, reinforced by the fact that many girls hold negative attitudes about their mathematics abilities and express high levels of mathematics anxiety (OECD, 2015[40]).

This can have serious implications not only for higher education, where young women are already under-represented in the science, technology, engineering and mathematics

(STEM) fields of study but also for later on when they enter the labour market. In 2015, women only accounted for 30% of all students graduating in natural sciences, engineering, and ICT fields at tertiary level across OECD Member countries (OECD, 2017[12]). Furthermore, women represent only 20% of tertiary graduates in ICT-related studies – fields that are particularly relevant in the digital era.

Policy makers across the OECD are increasingly aware of gender stereotyping at school and at home, and the effect that it may have on future education and career choices, and many countries have initiated efforts to address these stereotypes and further bridge the divide.

Stemming growing income inequality

Income inequality has been called one of the defining challenges of today, undermining support for globalisation and even trust in our democratic institutions. Income inequality has risen over the last three decades in OECD Member countries, with a broad pattern of rapidly rising incomes at the very top and stagnation at the bottom (OECD, 2017[41]). In OECD Member countries, the top 10% of the income distribution earned about seven times the income of the bottom 10% in the mid-1980s; increasing to almost ten times by the mid-2010s. The Gini coefficient for the area increased over the same period. In emerging economies, the picture is more contrasted: since the 1990s, income inequality has risen in China and South Africa, but it has declined, albeit from high levels, in several large Latin American economies such as Chile and Mexico.

Rising income inequality partly reflects increasing labour demand for highly skilled workers, driven by technological change and globalisation (Card and Dinardo, 2002[42]; Goldin and Katz, 2007[43]; Acemoglu and Autor, 2011[44]). In order to address inequality, skills policies need to support people to develop the skills that are most in demand in the economy. Particular attention needs to be paid to raising the skill levels of low-skilled workers, who need opportunities to develop, maintain and upgrade their skills to reduce the risk of becoming trapped in low-quality jobs and joblessness, and to be able to respond to the rapidly changing demand for skills in existing and new jobs. This is particularly challenging since low-skilled workers tend to participate less in adult-learning activities (OECD, 2016[1]). Low-skilled workers can be encouraged to participate in adult-learning activities through on-the-job training that specifically recruits and targets low-skilled workers, and skills acquired through work experience can be certified.

The importance of, and means for, developing more equitable skills opportunities and outcomes is discussed in greater length in Chapter 4 on developing relevant skills over the life course; Chapter 5 on using skills effectively in work and in life; and Chapter 6 on strengthening the governance of skills systems.

The imperative of making better use of technology as a learning pathway

The *OECD Skills Outlook 2019* (OECD, 2019[45]) argues for the importance of making better use of technology as a learning pathway. New technologies can enhance learning and help develop skills for the 21st century. Many new pedagogical approaches make use of new technologies. Digital tools favour personalised instruction, allowing students to progress at their own pace and teachers to spend more time with learners experiencing greater difficulty. Technology changes the content and sources of knowledge: traditional textbooks and curriculum may be supplemented with educational software, online courses or digital textbooks. These expand the opportunities young learners have to both find information and to practice the digital competencies required for sustainable use of new

technologies (OECD, 2016[5]). At different levels of education in school, new digital devices allow for the exchange of teaching practices, easier and broader collection of students' data to facilitate more rapid and better-targeted student feedback, and the real-time dissemination of instruction and teaching, even to isolated areas (OECD, 2019[45]).

More generally, digital tools extend the learning universe outside of the physical premises of educational and training institutions. Workers, in particular, can easily learn on the job through the Internet and employers can propose online training programmes that can be adjusted to work around time constraints. Massive open online courses (MOOCs) offer new learning opportunities and can be used as a way for students or workers to signal or develop specific interests or knowledge.

However, evidence regarding the impact of technology use in schools on student performance has been mixed. Investment in ICT in the form of computers, tablets or Internet connections has failed to translate into higher academic achievement for students, even though such investments did not crowd out resources allocated to other educational inputs (Bulman and Fairlie, 2016[46]). This suggests that the way technology is used matters: both students and teachers need to be motivated and prepared to use technology so that it has a positive impact on learning.

Available data suggest that open education and MOOCs more specifically can facilitate the lifelong learning of workers (OECD, 2019[45]). Open education is mostly used by those who combine work and formal education (Goodman, Melkers and Pallais, 2016[47]). Many MOOC platform providers have started exploring MOOCs for professional development, and there are already some successful examples of MOOCs in this area (Music, 2016[48]). Yet, the potential that MOOCs can offer to firms to train their workers is not yet fully realised. In addition, while open education and MOOCs can generally be accessed for free, patterns of participation seem to reproduce those of participation in standard adult education and training in that highly educated and highly skilled adults are more likely to participate (OECD, 2019[45]).

Finally, people need a range of skills to benefit from the learning opportunities brought about by technology. For example, using MOOCs may require good ICT skills as well as time management skills and an ability to be a self-motivated learner. Online job search may be more effective, particularly for adults who have been away from the labour market for a long time, if it is complemented by effective career guidance skills (OECD, 2019[45]).

The potential to harness technology as a learning pathway is discussed in greater length in Chapter 4 on developing relevant skills over the life course and Chapter 6 on strengthening the governance of skills systems.

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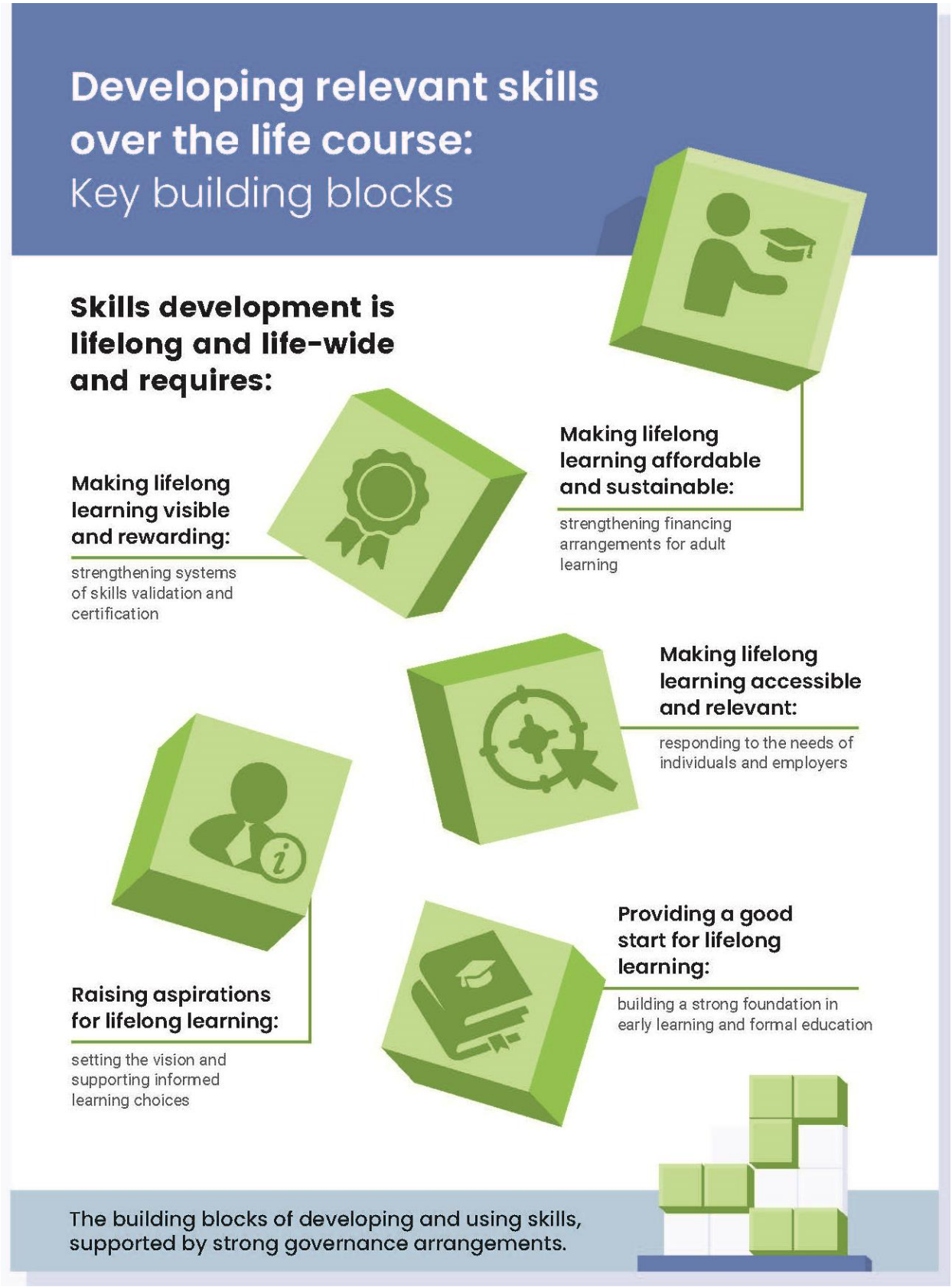
Chapter 4. Developing relevant skills over the life course

This chapter presents the portion of the OECD Skills Strategy Dashboard that pertains to developing relevant skills over the life course. It explores five policy priorities for improving performance in developing relevant skills: 1) raising aspirations for lifelong learning; 2) providing a good start for lifelong learning; 3) making lifelong learning affordable and sustainable; 4) making lifelong learning visible and rewarding; and 5) making lifelong learning accessible and relevant.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.


Developing relevant skills over the life course:
Key building blocks
Skills development is lifelong and life-wide and requires:
Making lifelong learning affordable and sustainable:
strengthening financing arrangements for adult learning
Making lifelong learning visible and rewarding:
strengthening systems of skills validation and certification
Making lifelong learning accessible and relevant:
responding to the needs of individuals and employers
Providing a good start for lifelong learning:
building a strong foundation in early learning and formal education
Raising aspirations for lifelong learning:
setting the vision and supporting informed learning choices
The building blocks of developing and using skills, supported by strong governance arrangements.

Box 4.1. Key policy lessons on developing relevant skills over the life course

Raising aspirations for lifelong learning: National visions and strategies can promote awareness of the benefits of lifelong learning and guide the development of coherent and co-ordinated policies to support lifelong learning. Comprehensive and user-friendly information on the potential benefits of learning, current and expected skills needs, and available learning opportunities can help raise aspirations to learn and steer learning decisions over the life course.

Providing a good start for lifelong learning: The early years set the foundation for lifelong learning. Removing financial and other barriers to early childhood education and care (ECEC), and ensuring its high quality is essential to encourage participation. Family support programmes, visits and financial subsidies can help ensure that children, particularly from disadvantaged backgrounds, get a positive start in learning. Compulsory education plays a critical role in developing foundational skills and positive attitudes toward learning. Countries should identify low-performing and/or disadvantaged students early, provide targeted support for them and their schools, maintain high expectations for each student, and train and retain experienced and highly qualified teachers. Finally, the post-compulsory education system can consolidate youth's maturation into skilled, adult learners. This entails targeted support and guidance for at-risk and disadvantaged youth, high-quality, work-based learning opportunities, combined basic skills and practical training, and opportunities for "second-chance" learning.

Making lifelong learning affordable and sustainable: Adults and enterprises have a range of needs for and barriers to learning. Financial barriers are typically high for adults from a disadvantaged background, as well as smaller enterprises. Funding systems can make adult learning affordable for those who need it most, while also keeping public funding sustainable. This can be achieved by targeting funding to individuals (irrespective of their contract type or with whom they learn), especially those from a disadvantaged background. It can also be achieved by coupling financial incentives with other supports, including for small-sized enterprises.

Making lifelong learning visible and rewarding: Acquiring skills through life is most rewarding for individuals when they can be recognised. Countries can help make the skills visible by moving to a competency-based approach to formal qualifications, encouraging certification for non-formal education and training, recognising non-formal and informal learning in national qualifications frameworks, harnessing technology to certify skills, and pursuing international harmonisation of recognition and certification.

Making lifelong learning accessible and relevant: Boosting engagement in learning through life requires that learning opportunities are accessible and flexible to meet learners' needs. This can be achieved by putting the needs of adults and employers at the centre of education and training design, tailoring programmes to learners' specific needs and contexts, addressing gaps in adults' foundational skills, harnessing technology to make learning more accessible and tailored, and responding to specific skills needs in the economy and society. Tertiary institutions too must get better at responding to the learning needs and barriers of adult learners.

Introduction

Developing strong skills is an investment in countries' economic prosperity, social cohesion and broader well-being. Across OECD Member countries, adults with higher levels of skills in literacy, numeracy and problem solving with computers enjoy higher rates of employment, higher earnings, report better health and are more engaged in civic life (OECD, 2016[1]; OECD, 2013[2]).

Megatrends – including advances in technology, globalisation and the expansion of global value chains, demographic change, migration, as well as climate change – are combining to make lifelong learning imperative (see Chapter 3, "The skills implications of megatrends"). The traditional approach of front-end loading skills development is increasingly untenable in a world of rapid technological, economic and societal changes. Learning over the life course is not only for the highly skilled; it is essential for all citizens, in order to become full and active participants in the economy and society.

Given the importance of skills for individual and societal well-being, creating more equitable opportunities and outcomes is also critical. As noted in Chapter 3 (see the section in Chapter 3, "The imperative of creating more equitable opportunities and outcomes"), unequal skills outcomes across population groups is a major source of inequality that can undermine social cohesion.

To improve the quality and efficiency of skills development, more can be done to better use new technologies to support learning. Chapter 3 (see the section, "The imperative of making better use of technology as a learning pathway") argues that the lifelong learning imperative means skills systems must be designed to serve learners of all ages and socio-demographic backgrounds. Technological advances also present opportunities – as yet under-realised – to develop skills in a more inclusive manner and at less cost.

OECD Member countries show varying levels of performance in developing strong skills from youth to adulthood. They face many similar policy priorities and challenges and implement a range of policies and practices in response.

Assessing performance in developing relevant skills

Through its experience working with countries on national skills strategy projects, the OECD has identified a set of key indicators to assess the overall performance of countries in developing relevant skills and using skills effectively. These are presented in the OECD Skills Strategy Dashboard. This dashboard allows countries to make a preliminary assessment of the comparative strengths and weaknesses of their skills systems and facilitates analysis of potential trade-offs or synergies in skills policies.

Indicators of **developing relevant skills** are presented in Table 4.1 (indicators on using skills effectively are presented in Chapter 5). The outcome indicators included in this dashboard were chosen to reflect the lifelong and life-wide perspectives of the OECD Skills Strategy, as well as to reflect the level, inclusiveness and trends in skills performance.

A key conclusion from Table 4.1 is that while performance in skills development at one stage in life tends to have important implications for performance at later stages, this relationship is not always straightforward. For most countries, each stage of the education and training system builds on the success of the previous one, but often countries fail to continue this cycle of continuous skills development throughout life.

Table 4.1. OECD Skills Strategy Dashboard: Developing relevant skills over the life course

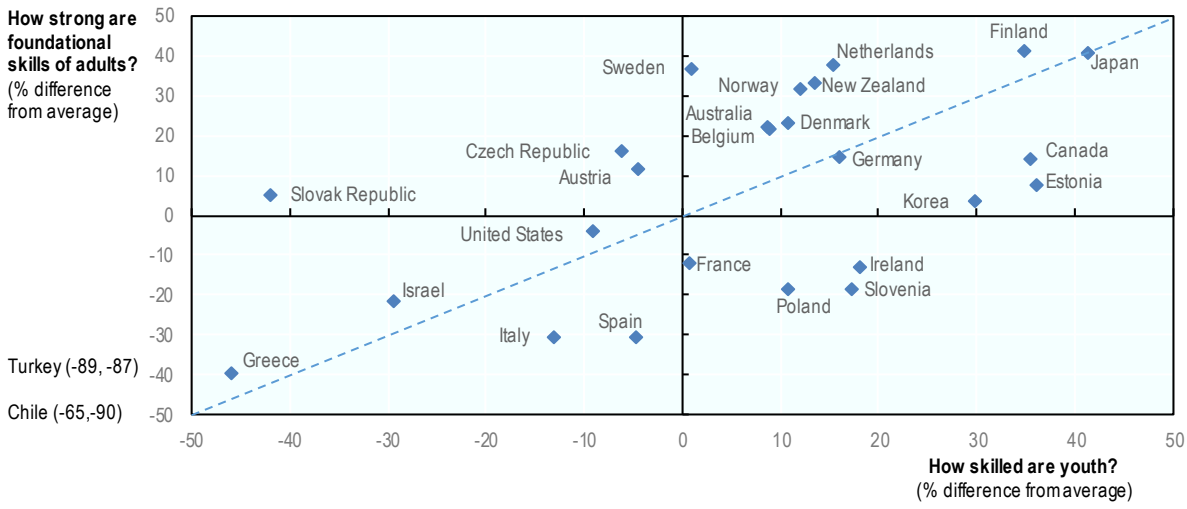
1. For Belgium (Flanders), United Kingdom (England and Northern Ireland), a combination of regional (PISA and PIAAC on the level of Flanders, England and Northern Ireland) and national data have been used depending on the source.

Note: The Skills Strategy Dashboard has a focus on outputs of the skills system. A list of relevant indicators has been selected and aggregated and normalised in such a way that a higher value and being among the "Top 20%" reflects better performance. Colours in the dashboard represent the quintile position of the country in the ranking. The "x" indicates insufficient or no available data for the underlying indicators, and dotted circles indicate missing data for at least one underlying indicator. Data was not available for all aggregate indicators for all countries, particularly due to absence in the Survey of Adult Skills (PIAAC). An explanation of the underlying indicators is provided in the Annex A.

Countries whose youth and students develop strong skills typically also have highly skilled adult populations

Early success in skills development matters for success in skills development in later stages of life. The majority of countries with strong average skills outcomes in compulsory education (top 40% or better in the PISA survey) also see strong average skills outcomes among their adults (top 40% or better in PIAAC) (Figure 4.1), with Finland and Japan as the best examples of top-performance in skills development of both youth and adults. However, the reverse is also true: the comparatively poor average performance of youth (bottom 40% or worse) in countries such as Chile, Greece, Israel, Italy, Spain, Turkey and the United States are met by poor average outcomes for adults (bottom 40% or worse).

Figure 4.1. Relative performance in skills development for youth and adults



Note: The figure is based on indicators from the OECD Skills Strategy Dashboard, using normalised scores of the following aggregated indicators: "How skilled are youth?", based on PISA scores 2015, and "How strong are the foundational skills of adults?", based on PIAAC scores.
Source: OECD (2016[3]), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, https://doi.org/10.1787/9789264266490-en; OECD calculations based on (2018[4]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

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Comparable patterns can also be found for performance in tertiary education – countries with highly skilled students generally also have highly skilled adult populations. However, it is important to note that high attainment rates in tertiary education are not a guarantee of strong average skills performance. In a number of countries with high tertiary attainment rates among young adults – including Canada, England (United Kingdom), Ireland, Israel and Korea – recent graduates have comparatively low average skill levels. This underscores the importance of ensuring that policies to improve access to tertiary education are complemented by policies to strengthen the quality of tertiary education.

Overall, looking at average country performance, each stage of the education and training system generally builds on the success of the previous one, which shows the importance of the early years for strong skills development through life (see the section below, "Providing a good start for lifelong learning: Building a strong foundation in early learning and formal education").

Performance at one stage of life does not perfectly predict performance in another – some countries improve, while others fail to capitalise on early successes

Several countries experience uneven skills development performance over the life course. For instance, in the Czech Republic, the Slovak Republic and Sweden, adults' skills are strong compared to youth's skills, and conversely, in Ireland, Korea, Poland and Slovenia, the skills of adults are weak compared to those of youth.

Differences in performance among age groups at a given point in time can be explained by a variety of factors. These include a change in educational attainment and the quality of compulsory education over time, as exemplified by diverging trends in PISA in recent years, e.g. the Czech Republic, Slovak Republic and Sweden show a negative trend, while Ireland, Poland and Slovenia show a positive trend. Other factors include changes in tertiary education attainment and in the quality of tertiary education, the effect of skills atrophy over time, and changes in the accessibility and quality of adult education and training. While the combination of these factors make a direct comparison of performance in different stages difficult, the uneven skills development performance over the life course highlights the need for broad policy action at all stages of the life course (see the section below, "Raising aspirations for lifelong learning: Setting the vision and supporting informed learning choices").

A strong culture of adult education can be developed in all countries regardless of the skills of their populations

Some countries with below average performance in the skills development of youth and adults appear to have a strong culture of adult education, defined here as having a high rate of engagement and reported interest in learning in adulthood, as well as having relatively low barriers to learning in adulthood. This pattern is most notable in the United States – the average skills outcomes for youth, tertiary graduates and adults are relatively low, but participation and willingness to participate in adult education is relatively high, with low barriers to participation. A similar pattern can be found in Chile and Israel, albeit to a lesser extent. While the strong culture of adult education in these countries is a clear positive achievement, the low skill levels of the population do raise questions about the effectiveness and relevance of adult education and about whether poor performance in skills development in earlier years necessitates greater engagement in learning in later years.

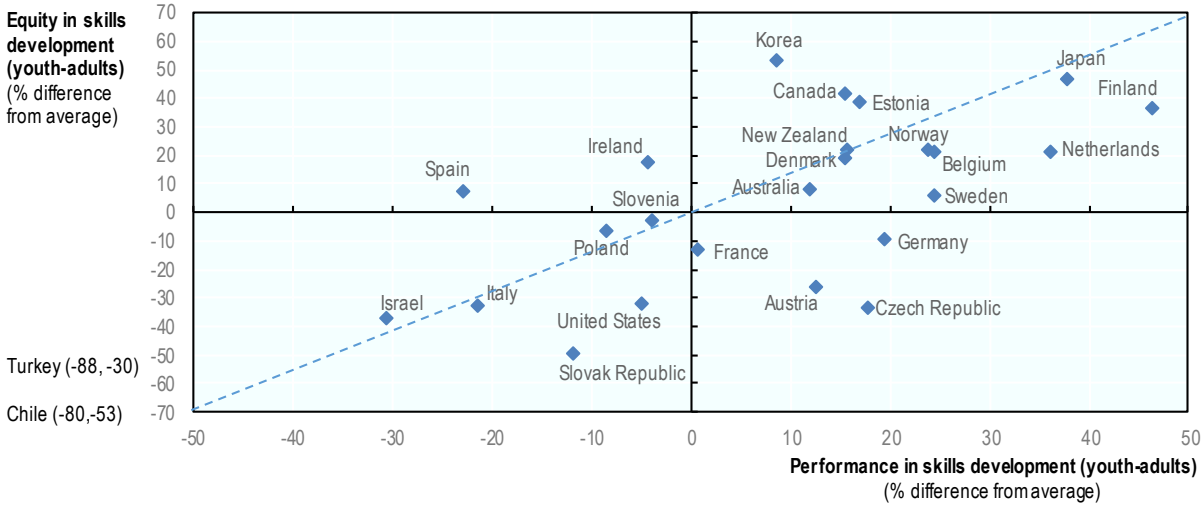
Countries whose adults already have high skill levels should not be complacent and should continue to invest in adults' skills. Technology continues to transform or abolish jobs and create new ones, while also transforming how people live and interact. Even highly skilled adults cannot rely on their current skills being sufficient for the future needs of the economy and society. Adult education and training can help individuals to upskill and reskill over time, to ensure their skills remain relevant in an ever-changing world. It is important even for countries with highly skilled populations to continue enacting policies that promote lifelong learning and raise participation and motivation (see the sections below, "Making lifelong learning affordable and sustainable: Strengthening financing arrangements for adult learning" and "Making lifelong learning visible and rewarding: Strengthening systems of skills validation and certification").

There is no trade-off between excellence and equity

Many countries with strong average foundational skills among their youth, tertiary graduates and adults also manage to ensure the inclusiveness of their performance in skills development (Figure 4.2). For instance, populations in Scandinavian countries, Belgium (Flanders), Canada, Estonia, Japan, the Netherlands and New Zealand, are relatively highly skilled and the socio-economic background and parents' education level only have a small effect on skills outcomes. Conversely, countries with the lowest equity performance are also those with the lowest average level of skills proficiency among adults. Chile, Israel, Italy, Poland, the Slovak Republic, Turkey and the United States score below average in almost all indicators related to skills levels and inclusiveness. Still, some countries are characterised by only average levels of equity in skills outcomes despite having high average levels of skills among adults. In Austria, the Czech Republic and Germany, for instance, foundational skills of the population are above average, but the effect of the parents' education level on skills is comparatively large.

These findings underscore that with the right bundle of policies, excellence and equity can go hand in hand. But in various countries, targeted policies are needed to help bolster the skills of disadvantaged individuals, for instance by improving accessibility and relevance of lifelong learning (see the section below, "Making lifelong learning accessible and relevant: Responding to the needs of individuals and employers").

Figure 4.2. Performance and equity in skills development



Note: The figure is based on indicators from the OECD Skills Strategy Dashboard. Performance in skills development is defined as the average of the normalised scores of aggregates "How skilled are youth" (based on PISA scores 2015), "How skilled are young tertiary-educated adults" and "How strong are foundational skills of adults" (both based on PIAAC scores). For the equity in skills development, the indicator is based on the aggregates "Are skills of youth being developed inclusively" (PISA ESCS parity index), "How inclusive is tertiary education", and "Are skills of adults being developed inclusively" (tertiary attainment and skills respectively by education level parents, PIAAC).

Source: OECD (2016[3]), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, https://doi.org/10.1787/9789264266490-en; OECD calculations based on OECD (2018[4]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

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Raising aspirations for lifelong learning: Setting the vision and supporting informed learning choices

The transformation of economies and societies has led many governments to focus greater attention on skills development throughout life as a key to prosperity and well-being. Many countries aspire to build a culture of lifelong learning, which as noted earlier can be broadly understood as a high level of interest and engagement in learning and training in various forms by all citizens, regardless of their age, educational experience or socio-economic background.

Through the establishment of universal compulsory schooling, governments have built the foundations for such culture: a large part of the population in OECD Member countries view the completion of formal education, at secondary, and increasingly at tertiary level, as a key investment for economic success and social well-being. For example, the share of tertiary-educated adults aged 25-34 increased substantially over recent decades, from 26% of the population in 2000 to 43% in 2016 on average in OECD Member countries.

However, after leaving the formal education system, many adults do not actively continue learning. As a consequence, the skills acquired become obsolete over time. Across all countries and regardless of the type of learning considered, adult learners tend to be highly educated, highly skilled and young. While the wealth of online learning opportunities that has emerged in the past two decades was expected to increase access to learning for all, to date opportunities such as massive open online courses (MOOCs) are taken up by only a small portion of adults who are already well-educated (OECD, 2019[5]). By contrast, low-skilled adults report the lowest rates of interest and participation in learning. Current adult-learning patterns thus reinforce previous educational inequalities but also risk worsening economic inequality as low-skilled adults are those most at risk of experiencing labour market disruptions such as those resulting from offshoring and automation.

The challenge: Uneven participation in learning

Developing a strong lifelong learning culture involves high levels of engagement in learning over the life course and across the entire population. Only a few countries perform well on indicators that measure the equity of opportunities in learning over the life course, including Estonia, Japan and the Netherlands (OECD, 2017[6]). However, the diversity of these countries and of their education systems suggest that different strategies can help achieve good learning outcomes for all.

Expanding non-compulsory learning, in early childhood and adulthood, is challenging. There has been some progress, however, with enrolment in early childhood education rising: participation rates for children under the age of 3 increased by over 8 percentage points between 2005 and 2014, from 26% to 34% on average across OECD Member countries. There remain significant variations among countries, and in many cases, socio-economic background continues to have a strong influence on participation (OECD, 2018[7]; OECD, 2017[8]).

At the other end of the spectrum, there has been a rise in adult-learning participation over time, for instance, in 2007, 35.2% of adults in European countries reported having participated in at least one learning activity in the past 12 months, a figure which rose to 45.1% in 2016. But large gaps remain across countries: the Netherlands and the Scandinavian countries have rates that exceed 60%, while in some countries this rate is

below 30% (OECD, 2018[9]). Adult learning involves a diversity of activities, identified in Box 4.2.

Box 4.2. Definitions: Lifelong learning and adult learning

Lifelong learning is understood as encompassing all learning activity "from the cradle to the grave", including all stages of education and training and taking place both in the formal education system and outside of it.

Adult learning encompasses any education or training activity undertaken by adults for job-related or other purposes, and include:

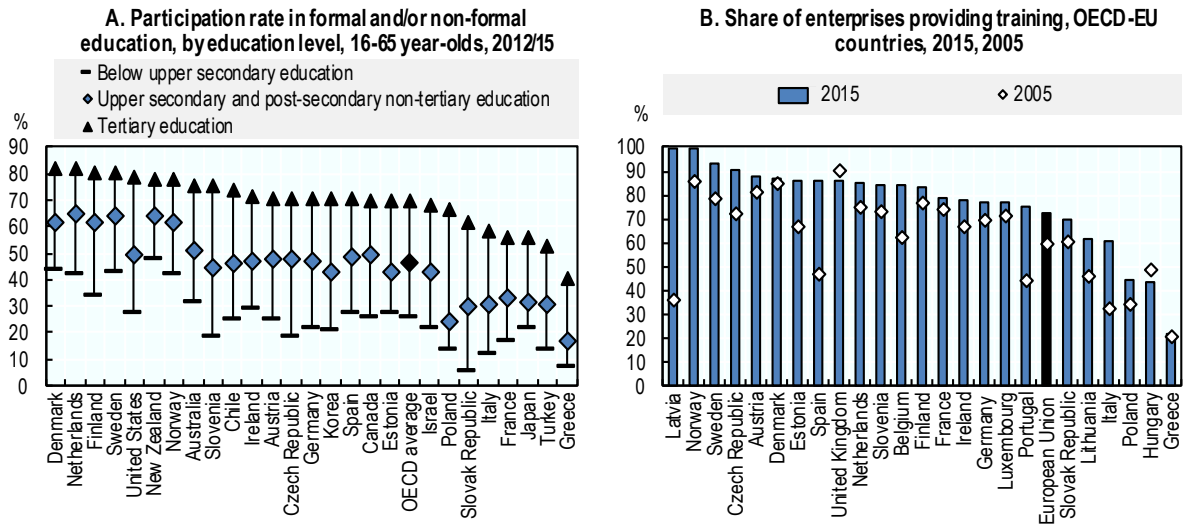
- **Formal education or training**: Education or training activity that leads to a formal qualification (at primary, secondary, post-secondary or tertiary level).
- **Non-formal education or training**: Education or training activity that does not necessarily lead to a formal qualification, such as on-the-job training, open or distance education, courses or private lessons, seminars or workshops.
- **Informal learning**: Learning that results from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning support. It is in most cases unintentional from the learner's perspective.

Source: OECD (2001[10]), *Education Policy Analysis 2001*, http://dx.doi.org/10.1787/epa-2001-en; Werquin, P. (2010[11]), *Recognising Non-Formal and Informal Learning: Outcomes, Policies and Practices*, http://dx.doi.org/10.1787/9789264063853-en; OECD (2019[5]), *OECD Skills Outlook 2019: Skills and Digitalisation*; OECD (2019[12]) *Getting Skills Right: Future-ready Adult Learning Systems*, https://doi.org/10.1787/9789264311756-en.

The propensity for the most educated, those in employment and in larger firms to participate the most in lifelong learning is widespread (OECD, 2018[9]; CEDEFOP, 2015[13]). As shown in Figure 4.3, in Greece, Poland, the Slovak Republic and Slovenia, the ratio between the highly-educated and low-educated adults who report having participated in learning exceeds 4:1. This means that for each low-educated adult participating in a learning activity, there are at least four highly-educated adults who participate. This gap exists both in countries with low overall participation, but also in countries with relatively high participation rates. By contrast, the Scandinavian countries and the Netherlands (OECD, 2017[14]) enjoy high participation rates, with smaller gaps between high- and low-educated.

On-the-job training can be one way to reach many adults, yet employer-sponsored training remains limited, concentrated in large firms, and most commonly available to highly skilled employees. Significant differences exist between countries, with Greece, Hungary and Poland continuing to lag behind with fewer than one out of two enterprises providing training in 2015. In Latvia, Norway, Sweden and the Czech Republic, this rate exceeds 90%.

Figure 4.3. Participation in lifelong learning and share of enterprises providing training



Source: OECD (2018[4]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/; Eurostat (2018[15]), *Continuing Vocational Training Survey (CVTS)* (database), https://ec.europa.eu/eurostat/web/microdata/continuing-vocational-training-survey.

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Adults face many barriers that limit their engagement in learning. These include direct and indirect costs, time constraints and a lack of relevant learning options. However, the main obstacle, particularly among adults with low skills, remains low motivation. About 75% of adults who took part in PIAAC say they are not interested in learning (OECD, 2013[2]). For employers, the balance between the costs of training and expected benefits, which depend on multiple factors including the time needed for productivity to increase and the ability to retain skilled workers, is at the core of training decisions (Bishop, 1996[16]; Mühlemann, 2016[17]).

Good practices

Countries with a strong culture of lifelong learning tend to have a shared understanding across society of the broad benefits of skills and learning for work and life. They also have mechanisms that encourage learning in multiple forms within and outside of the formal education system (OECD, 2019[5]). A first step to improve a country's culture of lifelong learning is to make the benefits of skills and learning more transparent.

Setting the national vision for skills and lifelong learning

National visioning exercises and strategies can help promote the benefits of skills and lifelong learning. They provide an opportunity to articulate and raise awareness of the benefits of skills and learning amongst a wide range of policy makers and stakeholders. Involving different ministries, sub-national government and stakeholders in the process of developing a national vision for skills and lifelong learning can also help raise awareness of the benefits of skills and lifelong learning. In Norway, the Norwegian Strategy for Skills Policy 2017-2021 describes the population's skills as society's most important resource and the basis for welfare, growth, wealth creation and sustainability (Box 4.3).

Box 4.3. Country practices: Setting the national vision for skills and lifelong learning

In 2017, **Norway** adopted the Norwegian Strategy for Skills Policy 2017-2021. This followed up on the recommendations of the 2012-14 OECD Skills Strategy Project, which advised Norway to develop a skills strategy incorporating a whole-of-government approach and strong stakeholder involvement.

The Norwegian strategy is a binding agreement among the Strategy partners, namely the government, employer associations, trade unions, the voluntary sector and the Sami Parliament. This strategy delineates the roles and responsibilities of each partner. For example, the government (ministries), in co-operation with social partners, is responsible for the development and implementation of the skills policy, and for ensuring co-ordination across policy sectors and levels of government. Municipalities, including local and regional authorities, are the school owners and provide numerous services to the end user. Employers provide training at the workplace, often in collaboration with other partners. The Sami Parliament ensures that the authorities enable the Sami people to have the necessary linguistic and cultural expertise to develop Sami society and businesses. The voluntary sector contributes to skills development both within and outside the labour market.

The Norwegian strategy is overseen by the Skills Policy Council and includes a Future Skills Needs Committee. The council consists of representatives of all the Strategy partners and is in charge of the follow-up of the strategy. They meet regularly during the strategy period and discuss feedback from the Future Skills Needs Committee, as well as other relevant issues. The council is responsible for assessing the strategy in the second year and will decide whether it should be renewed.

Source: OECD/ELS (2018[18]), "Policy Questionnaire: Readiness of Adult Learning Systems to Address Changing Skills Needs", internal document; Government of Norway (2017[19]), *Norwegian Strategy for Skills Policy 2017-2021*, www.regjeringen.no/contentassets/3c84148f2f394539a3eefdfa27f7524d/strategi-kompetanseeng.pdf.

Skills assessment and anticipation

Individuals and firms alike need information on the skills that are available or lacking in the labour market to make decisions about which skills to develop. Governments need this information to design relevant education and training policies and programmes. Many OECD Member countries have responded to this need by developing skills assessment and anticipation (SAA) systems which, to varying degrees, aim to identify the types of occupations, qualifications and fields of study in demand in the labour market, or that may become so in the future. These systems vary greatly across countries, according to the definition of skills, the methods used, as well as the geographical coverage, timespan and frequency of the assessments.

Promising practices exist in a number of countries to strengthen the quality and credibility of these exercises and expand their use. Using both quantitative and qualitative methods, as well as both short- to medium-term and longer-term assessments allows for robust analysis and a diversity of uses. Australia, Belgium (Flanders), Italy and Korea are among the few countries that systematically combine quantitative and qualitative data sources in the same SAA exercise. Denmark's Rational Economic Agent Model (DREAM) can be used to simulate and forecast national education levels 50 or more years into the future. In

Germany, the BIBB-IAB-Qualification and Occupational Fields Projections work on a 30-year projection capability, forecasting both occupations and qualifications using qualitative and quantitative data (OECD, 2017[20]). The *OECD Skills for Jobs* database (2018[21]) also provides timely information about countries' skills shortages and surpluses for a wide range of skills, including cognitive skills, social skills, physical skills and a set of knowledge types.

Involving multiple ministries can also enhance the policy uses of SAA exercises. Education and labour authorities both participate in the development of forecasts in Norway while in Portugal a government agency under the joint oversight of the Ministry of Education and the Ministry of Labour and the Ministry of Economy is responsible for managing the recently created SAA system (OECD, 2018[22]).

Another approach to improve both the quality and usefulness of SAA exercises is to establish structures to regularly engage stakeholders. In Australia, Canada, Denmark, Estonia, Finland, France, Germany, Portugal, the Slovak Republic and the United Kingdom, there are dedicated councils and committees that involve both employers and trade unions in the development of SAA information.

Several countries take a multi-method, cross-sectoral approach to improving information on skills needs (Box 4.4).

Box 4.4. Country practices: Improving information on skills needs

Norway's Committee on Skills Needs was formed in response to the need for an evidence-based understanding of Norway's future skills needs. This committee plays a key role in co-ordinating between different ministries and stakeholder bodies in the area of skills needs assessment and responses. The committee is funded by the Ministry of Education and Research, and its secretariat is within Skills Norway. The committee includes 18 members representing social partners, ministries, and researchers. It is tasked with compiling evidence on Norway's future skills needs, contributing to open discussions and better utilisation of resources between stakeholders, and producing an annual report with analyses and assessment of Norway's future skills needs. Unusually, these skills needs are forecast on the national, regional and sectoral level.

The Committee on Skills Needs uses a comprehensive set of methods and tools, including employer surveys, surveys of workers or graduates, quantitative forecasting models, sector studies, qualitative methods, and labour market information systems. It also focuses on how to use the projections: Norway forecasts skills needs 10 to 80 years into the future in the health sector and 35 years in advance in the teaching sector. It also carries out 20-year general occupational forecasts. It estimates the education resources required one year in advance and also estimates employment trends in specific industries one year in advance as a direct input for planning training and employment policy.

Portugal's skills needs assessment system is the Sistema de Anticipação de Necessidades de Qualificações, or SANQ, created in 2014. The SANQ is co-ordinated by the National Agency for Qualifications and Vocational Education and Training and includes a consultative board that includes the Public Employment Service, representatives of workers and employers, and also involves technical assistance from the International Labour Organization (ILO). Its diagnostic exercises assess skills needs through both a retrospective analysis of labour market trends and a forecast of the demand for certain qualifications. The system is used to plan the delivery of vocational education and training for youth, and the country is considering expanding the use for planning the supply of adult-learning programmes. Portugal is also following OECD guidelines on the application of skills needs data to the field of career guidance by utilising inputs of skills needs assessment to assist with guidance in its network of Qualifica Centres, formerly Centres for Qualification and Vocational Education, which aim to guide young people and adults in identifying opportunities to acquire qualifications as part of the National Catalogue of Qualifications.

Source: OECD (2016[23]), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*, http://dx.doi.org/10.1787/9789264252073-en; OECD (2018[22]), *Skills Strategy Implementation Guidance for Portugal: Strengthening the Adult-Learning System*, http://dx.doi.org/10.1787/9789264298705-en; Norwegian Committee on Skills Needs (2018[24]), *Mandate of Official Norwegian Committee on Skill Needs*, https://kompetansebehovsutvalget.no/mandate-of-official-norwegian-committee-on-skill-needs/.

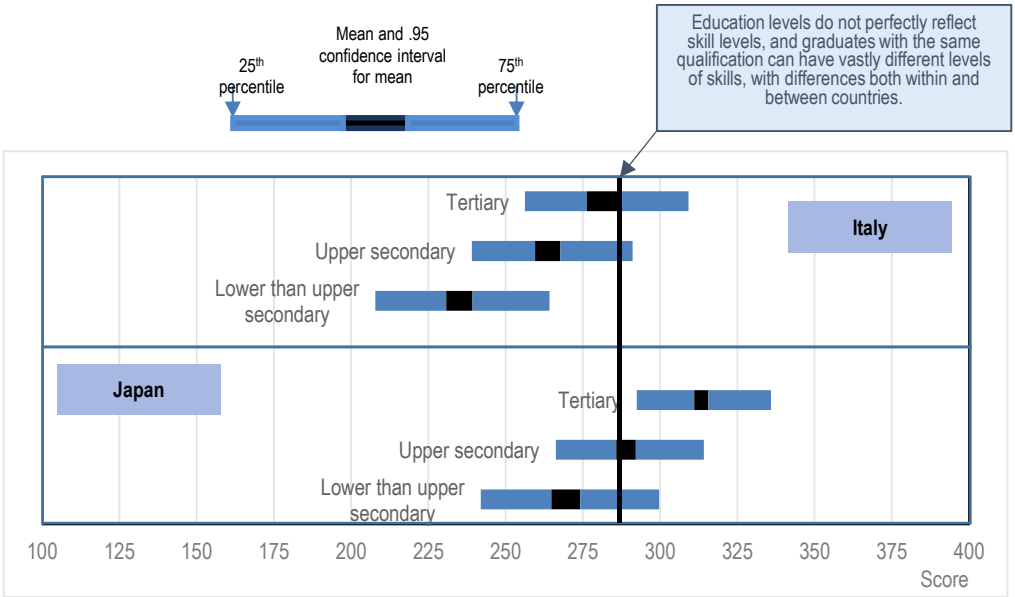
High-quality information on skills levels, and the benefits of skills and learning opportunities

Investing in skills delivers many benefits for individuals, firms and societies. For instance, benefits for individuals include better employment opportunities and higher earnings, as well as better job satisfaction, better health and increased propensity to participate in civic life. For employers, benefits may include increased productivity or improved innovation. For societies, the benefits range from having competitive and innovative workforces and greater tax revenues to more engaged and informed citizens and lower reliance on the public safety net.

The diversity of these benefits and the complexity involved in measuring them is challenging. However, there is value in better understanding these "returns to skills" independently of specific occupations and qualifications where they are used or developed, for several reasons. First, education levels do not perfectly reflect skill levels, and graduates with the same qualification can have vastly different levels of skills, with differences both within and between countries. In Italy and Japan, for example, many low-educated adults have literacy proficiency levels on par with medium- and even highly-educated adults (Figure 4.4) (OECD, 2018[25]). Furthermore, digital technologies offer many new opportunities for individuals to develop and demonstrate their skills apart from formal qualifications (Lehdonvirta et al., 2018[26]) (see the section below, "Making lifelong learning visible and rewarding: Strengthening systems of skills validation and certification").

Figure 4.4. Distribution of literacy proficiency scores and education in Italy and Japan

Mean literacy proficiency and distribution of literacy scores, by educational attainment



Source: Survey of Adult Skills (PIAAC) (2012) in OECD (2013[2]), *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, https://dx.doi.org/10.1787/9789264204256-en.

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Measuring the benefits of skills and skills bundles of various types, including social and emotional skills, can help signal skills in demand in the labour market. While occupations are an imperfect proxy to assess the skills people will need in the future, as many jobs of the future do not yet exist, more is known about what people are increasingly required to do at work – their tasks – and thus about the skills required in the workplace. For instance, workers in digital workplaces more frequently use skills such as management and communication, accounting and marketing and advanced numeracy, than in non-digital work environments (OECD, 2019[5]). Recent OECD evidence on the digitalisation and globalisation of the economy suggests that strong bundles of cognitive, non-cognitive and social and emotional skills are key for individuals and countries to be resilient and adaptable in the longer term (OECD, 2017[27]; 2017[28]; 2019[5]).

A first step to understanding the benefits of skills is to assess people's skills levels. International skills assessments, such as PISA and PIAAC, offer useful tools to assess skill levels and the benefits of skills. The OECD's Education and Skills Online assessment tool provides individual-level results that are comparable with national and international PIAAC results. It measures literacy, numeracy and problem solving in technology-rich environments, contains non-cognitive measures of skill use, career interest, health and well-being, and will soon measure behavioural competencies. For example, the Higher Education Quality Council of Ontario (HEQCO) completed two large-scale trials at 20 universities and colleges to measure literacy, numeracy and critical-thinking skills among entering and graduating students (see Box 4.9 later in this chapter).

Some countries have developed their own tools as well: in the United States, the Collegiate Learning Assessment ("CLA+") aims to measure the performance of higher education students in analysis and problem solving, scientific and quantitative reasoning, writing, critical reading and evaluation. The test has been expanded to include a version for school students and for international use (Council for Aid to Education, 2018[29]). In Canada, efforts have focused on assessing the skills needs of employers to develop a "Test of Workplace Essential Skills" allowing individuals to assess their performance on skills broadly needed by employers (Government of Canada, 2018[30]). The European Commission has also developed a Digital Competence Framework, used by several countries to develop tests of digital competence, and produces an annual assessment of digital skills in EU countries as part of the Digital Economy and Society Index (DESI). This index summarises 30 indicators on digital performance across the dimensions of connectivity, human capital, use of the Internet, integration of digital technology, and digital public services. Large firms have also developed their own assessments, as discussed later in this chapter.

Making the benefits of learning programmes more transparent is a challenge that countries must tackle if they are to increase interest and investments in learning from individuals and firms.

Much information is available on the returns to formal education, which is strongly linked to improved economic and social outcomes (OECD, 2017[31]). In the area of non-formal learning, a recent study by the OECD (Fialho, Quintini and Vandeweyer, forthcoming[32]) shows that job-related training is associated with an 11% rise in hourly wages. This is in line with a rich body of literature showing that non-formal learning can have positive effects on employability, earnings and firm productivity, as well as on various social outcomes such as personal health, self-confidence and community well-being (OECD, 2005[33]; Card, Kluve and Weber, 2015[34]; Adhvaryu, Kala and Nyshadham, 2018[35]; Merriam and Kee, 2014[36]). On the other hand, while informal learning is likely one of the most prevalent modes of learning in adulthood, there is little evidence of how it affects outcomes. The same study by the OECD estimates that informal learning is associated with a 3% increase in hourly wages (Fialho, Quintini and Vandeweyer, forthcoming[32]).

However, many factors affect the returns to adult learning, making it difficult to generalise these returns to specific learning programmes and provide guidance to prospective learners. These factors range from participants' backgrounds (including their previous skill level and time left in the labour market), the quality of training, the working environment (career prospects, skills use opportunities) and wage flexibility more generally.

Systematic monitoring of outcomes and effective evaluation of learning programmes are thus critical tools for countries to strengthen the quality of their learning systems and in turn promote a culture of learning. Various tools can be considered: impact evaluations with experimental designs, and measuring the value added of programmes by assessing skills levels before and after completion are examples of possible approaches, through the use of skills profiling and assessment tools. To improve trust in the value of adult learning, employers and formal learning providers need to recognise the skills acquired through non-formal learning. This makes good systems of skills recognition and validation essential, as discussed later.

Equally important is the need to effectively communicate the benefits individuals and firms can expect from lifelong learning. Governments can facilitate this process by disseminating information on the outcomes of learning programmes. For example, for two decades, the government of Ontario (Canada) has required publicly funded community colleges to make key performance indicators, such as employment rates, student, graduates, and employer satisfaction rates with graduates, available annually (Colleges Ontario, 2018[37]). Governments can also make greater use of new technologies to share information on the impact of learning: since 2017, France's Public Employment Service has been piloting a system of user ratings for professional training in sectors where there are tens of thousands of providers (Pôle Emploi, 2018[38]).

Promoting learning among the low-skilled requires targeted support, both financial and non-financial. Governments can leverage insights from behavioural economics to better design the type of information they provide, as well as the timing and manner in which information is shared.

Several countries have programmes underway to raise awareness of the benefits of and opportunities for learning (Box 4.5).

Box 4.5. Country practices: Raising awareness of learning benefits and opportunities

In **Slovenia**, Lifelong Learning Week, an annual campaign organised and co-ordinated by the Slovenian Institute for Adult Education (ACS), has helped develop a culture of lifelong learning in the country. It promotes learning opportunities via various programmes and providers, guidance services, and social and cultural events at the national and local levels.

The week commences with a grand opening and the ACS's annual adult-learning awards and involves an adult-learning conference, Learning Parades in selected towns, and a range of other events. The campaign seeks to build positive attitudes towards learning and education, and awareness of adult learning's importance and pervasiveness. Lifelong Learning Week has expanded significantly over the last two decades. In 2016, almost 9 000 events were organised throughout the country, bringing together nearly 1 800 providers and 150 000 visitors.

In **Poland**, the Database of Development Services (Baza Usług Rozwojowych) is a nation-wide, free online information platform that provides information on education and training offers (including vocational courses, counselling, postgraduate studies, mentoring or coaching), helping individuals and employers to find courses suited to their needs and make informed adult-learning decisions.

The database, administrated by the Polish Agency for Enterprise Development (PARP), contains detailed information on available training programmes and their providers, distinguishing between services that can be subsidised from the European Social Fund (ESF), and funded through private funds. It also provides quality information, such as user (both participant and employer) satisfaction. Training providers registered in the database are always verified by the PARP, based on their capacity to provide high-quality educational services.

Since its launch in 2017, the database has registered over 3 800 education and training providers offering over 212 500 services, among which 80% can be subsidised from the ESF.

In the **United States**, behavioural techniques are used to provide assistance and financial aid information. Research using behavioural economics measured the effect of different approaches to encourage individuals from low-income families to apply for financial aid to pursue higher education. A randomised field experiment model was used to see whether providing direct assistance in completing application forms for financial aid for higher education and/or information on the potential aid that would be available compared to the costs of tuition at local colleges would lead more individuals to apply for financial aid and then to higher education. The full treatment included both direct assistance on completing the process to apply for financial aid, provided by a tax professional during a meeting regarding tax matters, as well as information on the estimated aid individuals would receive compared to tuition at a local college. The full treatment had a significant impact, with student enrolment in higher education rising from 34% to 42% in the year after the experiment for those whose parents received the help, whereas providing only information but no assistance had no impact.

Source: Adapted from OECD (2018[39]), *Skills Strategy Implementation Guidance for Slovenia: Improving the Governance of Adult Learning*, http://dx.doi.org/10.1787/9789264308459-en; ACS (2017[40]) "Identity Card of TVU", http://tvu.acs.si/datoteke/TVU2017/Osebna%20izkaznica%20TVU%202017.pdf; Bettinger, Eric P. et al. (2012[41]), "The Role of Application Assistance and Information in College Decisions: Results from the H&R Block FAFSA Experiment", https://doi.org/10.1093/qje/qjs017; PARP (2018[42]), *Database of Development Services*, https://uslugirozwojowe.parp.gov.pl/, information provided by PARP (3 December 2018).

Policy recommendations for raising aspirations for lifelong learning

In light of the findings and practices above, the following policy recommendations can help countries raise aspirations for lifelong learning (Box 4.6).

Box 4.6. Policy recommendations: Raising aspirations for lifelong learning

- **Develop a national vision that promotes the benefits of skills and lifelong learning**. This could take the form of a national skills strategy or a strategy on lifelong learning. National strategies can articulate the need for and benefits of lifelong learning. They can also establish the promotion of these benefits as a national priority and prescribe appropriate measures, such as outreach and campaigns. Involving a wide range of ministries and stakeholders in the development of such a vision also helps raise awareness amongst key actors.
- **Strengthen skills assessment and anticipation systems**. Enhancing the methods used (e.g. quantitative and qualitative information, short- and longer-term projections, national/local levels) and engaging stakeholders can improve the relevance and use of skills assessment and anticipation information. Key uses should include supporting policy (e.g. education, employment, and migration), career guidance and decision making by prospective learners and employers.
- **Understand and communicate the benefits of participating in lifelong learning**. Improved data collection on the benefits of lifelong learning is essential to raise interest in learning and identify the types of programmes that work best. Information on the benefits of learning programmes should be developed based on sound methodology, encompass a broad set of relevant outcomes, and be communicated to users in a clear and user-friendly manner.

- **Provide comprehensive and user-friendly information on learning opportunities**. Individuals who are considering learning require information on what learning opportunities are available. This requires high-quality, centralised online information and effective guidance services, and is best complemented with information on the potential benefits of these opportunities.

Providing a good start for lifelong learning: Building a strong foundation in early learning and formal education

Lifelong learning starts early. Learning is a natural human activity, which knows no age boundaries and spans the entire life course. But learning is also a skill that individuals need to acquire. Becoming an effective lifelong learner begins in childhood and is heavily influenced by the institutional arrangements that provide opportunities to learn.

While far from being an automatic and cumulative process, learning at every stage of the lifecycle builds on learning outcomes and experiences from previous stages. Thus, it is important to build strong foundations in early stages on which a lifetime of learning can flourish. This section discusses the ways through which the early stages of learning and school education can enable or hinder the building of the foundations for skills development over the life course.

The skills that are needed to become an effective lifelong learner are manifold. First, a strong basis of cognitive development and cognitive foundation skills is needed. Language development, literacy, numeracy, problem-solving skills that can be mobilised to tackle a variety of challenges, all these constitute the foundation on which a life of learning can be built. Second, well-developed, non-cognitive skills are needed. Social skills that enable an individual to effectively interact with others and learn from them, but also emotional skills and personality traits such as conscientiousness and openness create a favourable disposition to later learning. Meta-cognitive skills – or "learning-to-learn" skills – enable an individual to steer his or her own learning trajectory, to learn from mistakes, to become goal-oriented in learning endeavours, and to experience satisfaction and pride in learning.

The challenge: The enduring impact of social and family background

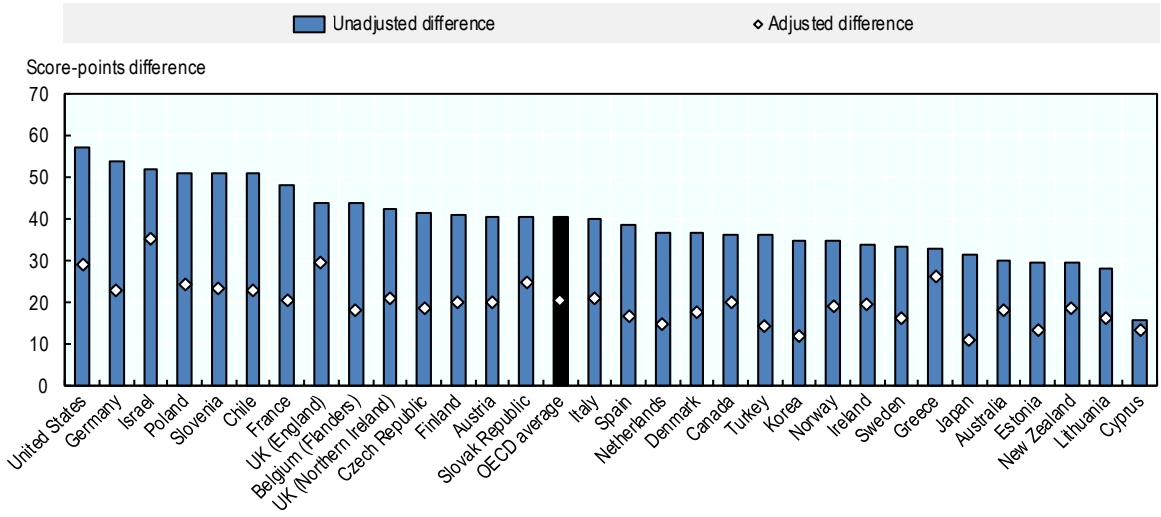
Learners do not start their educational journeys as blank sheets of paper. By virtue of the situations and environments they are born into, these journeys are to some extent influenced and determined. Countries, regions, communities and families differ to a large extent in how much they value and support learning. As a result, the opportunities to acquire the skills and attitudes necessary to become a lifelong learner are unequally distributed.

Inequality in income and wealth, but also in social and cultural capital, can limit the opportunities for those in the lower levels of the income and wealth distribution to move up the economic and social ladder. Those who start at a disadvantage are less likely to have access to a high-quality learning environment and to receive support for developing the capacity to climb the socio-economic ladder as they grow up. As a result, educational and skills gaps between individuals of different socio-economic status (SES) can exacerbate income and wealth inequality, perpetuating the vicious cycle from one generation to the next.

Parental educational attainment is, next to wealth or cultural resources at home, one of the main measures used to assess the importance of the family background on individuals' learning opportunities. Like any other measure, it has its shortcomings, such as the fact that it is not stable over time and is influenced by the timing of educational expansion in a country. PIAAC revealed a substantial gap (a difference of 40 points) in literacy scores between adults with highly and poorly educated parents (Figure 4.5). Even after accounting for socio-demographic factors such as gender, age, foreign-born status and the number of years the respondent had been working for a current employer or had been self-employed, a gap in literacy skills remains in all countries participating in the survey (OECD, 2016[1]). The gaps are particularly high in the United States, Germany, Israel, Poland, Slovenia, Chile and France (OECD, 2016[1]). This suggests that adults with more educated parents have benefited from better learning opportunities and support than those whose parents who are not as well educated.

Figure 4.5. Gaps in literacy between adults with high-educated and low-educated parents

The difference in literacy proficiency between adults with at least one parent with tertiary education and adults without a parent who has attained an upper secondary education



Note: All differences are statistically significant. Unadjusted differences are the differences between the two means for each contrast category. Adjusted differences are based on a regression model and take account of differences associated with other factors, such as age, gender, education, immigrant and language background. Only the score-point differences between two contrast categories are shown, which is useful for showing the relative significance of parents' educational attainment in relation to observed score-point differences. Upper secondary education includes ISCED 3A, 3B, 3C long and 4. Tertiary includes ISCED 5A, 5B and 6. The adjusted difference for the Russian Federation is missing due to the lack of language variables. The OECD average is based on the sample of OECD Member countries/regions assessed in the Survey of Adult Skills (PIAAC).

Source: OECD (2016[1]), *Skills Matter: Further Results from the Survey of Adult Skills*, http://dx.doi.org/10.1787/9789264258051-en.

StatLink https://doi.org/10.1787/888933927970

Good practices

Laying the foundations: The critical importance of high-quality early learning

Early childhood is a critical period. According to the economist and Nobel laureate James Heckman, "Early learning begets later learning and early success breeds later success,

just as early failure breeds later failure" (Heckman and Carneiro, 2003[43]). Heckman analysed how human capital accumulates over time and how the returns to investment vary at different stages in life. Children with high levels of learning ability at an early age are more likely to augment their skills and benefit from better outcomes in the future (Heckman and Carneiro, 2003[43]; Cunha et al., 2006[44]).

Home learning environments have an important impact on children's early childhood outcomes. In some families, this may pose a particular challenge. Lone-parent and low-income families with low levels of educational attainment tend to have limited resources, abilities and time to invest in early learning. Particularly in countries or communities that are still far from achieving universal enrolment in early childhood education and care (ECEC), countries need to develop interventions to improve the conditions for learning at home. Evidence-based parenting programmes, home visits for troubled families and subsidies to boost income can help these families improve the learning environments they provide for their children (Haskins and Margolis, 2014[45]). Home visits, community outreach and parenting training initiatives to foster greater social cohesion, community development and improved outcomes for children are also recommended (OECD, 2012[46]).

A growing body of research indeed confirms that ECEC improves children's cognitive abilities, helps to create a foundation for lifelong learning, makes learning outcomes more equitable, reduces poverty, and improves social mobility from generation to generation. These benefits tend to be higher for young children from disadvantaged backgrounds. Since inequities in education opportunities and outcomes tend to grow when school is not compulsory, earlier entrance into the education system may help to give all students a better chance to succeed and, therefore, reduce educational inequities. As countries continue to expand their early childhood education and care programmes, it will be important to consider parents' needs and expectations regarding accessibility, costs, programme quality and accountability.

The quality of ECEC is a crucial element in children's learning outcomes and in the development of their socio-emotional skills; it also influences parents' decisions whether to use such services. Children from disadvantaged backgrounds are generally at higher risk of not being able to obtain quality ECEC services (OECD, 2016[47]; OECD, 2011[48]). Attracting high-quality ECEC teachers to impoverished areas is difficult and constructing and improving ECEC facilities can be challenging if funding is not forthcoming.

ECEC institutions and programmes are very different from one country to another, with strong variation in either the care or learning functions. Still, despite the variations, benefits for children's skills development are undeniable. Two years of ECEC is the threshold duration required to significantly boost academic performance at age 15, according to 2015 PISA data. However, only around 66% of 15-year-olds from the most disadvantaged backgrounds reported more than a year of experience in early childhood education, while 81% of their peers from the highest tranche of socio-economic backgrounds reported more than a year's experience in pre-primary education on average across OECD Member countries (OECD, 2013[49]).

The price for missing out on learning opportunities in the early stages of life is high. On average in OECD Member countries, some 41% of students without pre-primary education perform below the baseline proficiency level (Level 2) in mathematics. In contrast, 30% of students with at least a year of pre-primary experience and 20% of students with more than one year of pre-primary education perform at the baseline level. In all countries except Albania, Estonia, Ireland and Latvia, having more than one

year of pre-primary education had a statistically significant effect on each country's share of low performers (OECD, 2016[47]). The gap is particularly large in OECD Member countries like Chile, France, Greece, Israel, Mexico, and the Slovak Republic. Even after controlling for other student characteristics such as socio-economic status, gender, immigrant background, language spoken at home, family structure, location of student's school (rural area, town or city), grade repetition and programme orientation (vocational or general), the likelihood of low performance in mathematics for a student with no pre-primary education is almost double (1.9 times) that of a student who attended more than a year of pre-primary education (OECD, 2016[47]).

OECD Member countries have taken various measures to expand access and quality in early learning (Box 4.7).

Box 4.7. Country practices: Expanding access and quality in early learning

In **Australia**, the participation of 3-4 year-olds in pre-primary education (ISCED 02) is close to the OECD average. Participation rates at age 4 have risen dramatically since 2005, from 53% in 2005 to 85% in 2014, representing the fourth highest increase among OECD Member countries. To strengthen performance and support disadvantaged and indigenous populations, Australia has developed a number of strategies, including the National Partnership Agreement on Universal Access to Early Childhood Education, which aims to maintain universal access to quality early childhood education programmes for all children in the year before full-time school for 600 hours per year, delivered by a qualified early childhood teacher who meets National Quality Framework requirements.

In the **Slovak Republic**, enrolment in ECEC is comparatively low compared to the OECD average. Evidence shows that only 28% of Roma children were enrolled in pre-primary education in 2011, compared to about 70% for all children. In response, the Slovak Republic took action to improve access to ECEC, with a focus on expanding kindergarten capacity in high-demand areas, supporting the participation of disadvantaged children, and providing childcare in the workplace. The Strategy of the Slovak Republic for Roma Integration by 2020 also aims to improve the position of vulnerable Roma communities in the coming years. This support is financed from the state budget and EU structural funds. In 2015, municipalities with the highest demand for ECEC could apply for financial support to expand their pre-school capacity (total budget allocation of EUR 15 million from the state budget). In the first round, the Ministry of Education, Science, Research and Sport will support the creation of 3 600 new ECEC places in 113 municipalities. Due to the high number of applicants, the government intends to allocate additional resources to satisfy the remaining demand.

The European Union and the Slovak government are co-financing inclusive education in kindergartens in 82 municipalities to increase the participation in ECEC of disadvantaged children, including Roma children. Additional national projects, amongst others, focus on raising awareness of the importance of ECEC among Roma parents, developing and implementing an inclusive kindergarten curriculum, training ECEC teachers to work with Roma children and hiring teaching assistants.

Source: OECD (2017[8]), *Starting Strong 2017: Key OECD Indicators on Early Childhood Education and Care*, http://dx.doi.org/10.1787/9789264276116-en.

Building a solid base: Compulsory schooling

If educational investments made during early childhood are to be productive, continued support throughout schooling is crucial. The years of compulsory schooling, when all students are required to attend schools, make it possible to reach and educate as many students as possible. Curriculum frameworks, of varying nature and level of detail, prescribe what students need to learn in terms of knowledge, skills, attitudes and values, including learning-to-learn skills and positive attitudes towards learning.

Compulsory schooling aspires to reach all age-specific students. Still, the situation of students who are not in school is a cause for concern, as they do not have access to the educational opportunities they need to acquire skills. Although enrolment in primary and secondary education is almost universal in most OECD Member countries, many countries around the world have much work to do to make education accessible to all (OECD, 2016[3]). According to data from the Institute of Statistics of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), in 2014 about 16% of youth of lower secondary school age across the world did not attend school. The latest PISA report (OECD, 2016[3]) also acknowledges the variation in school enrolment rates among the participating countries. In 20 countries participating in PISA 2015, fewer than 80% of 15-year-olds are enrolled in school and eligible to participate. Being out of school is not necessarily synonymous with being deprived of all possible sources of learning, but school education is essential for building skills for lifelong success.

The quality of learning in schools ("learning outcomes") is as important as access to school education. The results of successive PISA rounds highlight large differences in learning outcomes. Also, learning outcomes are far from being distributed in an equitable way, but are strongly impacted by various sources of inequity, most importantly by social and family background. PISA results have consistently demonstrated significant performance gaps between students of different socio-economic backgrounds in most participating countries.

According to the latest PISA 2015 results, students' socio-economic backgrounds have a varying degree of influence on their performance in science, reading and mathematics. In countries like Austria, Belgium, Chile, France, Germany, Singapore and Switzerland, socio-economic backgrounds exercise a particularly strong influence on students' performance, since students from disadvantaged backgrounds in these countries are very likely to not perform as well in PISA assessments as their peers from advantaged backgrounds. On the other hand, in countries and territories like Canada, Denmark, Estonia, Finland, Hong Kong (China), Japan, Korea, Macau (China) and the United Kingdom, the socio-economic background of students has a much weaker influence on their performance. Moreover, these are all countries where the quality of learning outcomes is relatively high, indicating that there is no unavoidable trade-off between excellence and equity of learning. The differing rates of progress in providing education and skills to disadvantaged learners suggest that education policies and educational institutions and actors play a central role in mitigating the gap between socio-economically advantaged and disadvantaged students and ensuring that all students have opportunities for high-quality learning. Some countries have taken steps to support the learning outcomes of immigrant and refugee students in particular.

The situation of low-performing students merits special attention because there is a high probability that low achievement at school limits the chance of becoming effective lifelong learners later in life. According to the latest PISA report (OECD, 2016[50]), 28%of students scored below the baseline level of proficiency in at least one of the three

core subjects that PISA assesses (reading, mathematics and science). The share of low performers is greater in mathematics (23%) than in reading or science (18% in each) on average across OECD Member countries. In OECD Member countries, the performance of almost 4 million 15-year-old students in mathematics and almost 3 million 15-year-old students in reading and science is low. For the 64 countries and economies that participated in PISA 2015, the figures include 11.5 million 15-year-old students in mathematics, 8.5 million in reading, and 9 million in science who are low performers (OECD, 2016[47]).

Countries take a variety of approaches to ensure access and quality in compulsory schooling and provide a good start for lifelong learning (Box 4.8).

Box 4.8. Country practices: Ensuring access and quality in compulsory schooling

In **Spain**, early school leaving has been a problem for a long time. For decades more than one in four students (30%) left school with low levels of skills. Most of these students come from low socio-economic backgrounds, and 70% do not obtain the lower secondary degree.

Early school leaving was identified as a major priority in the education reform (Ley Orgánica de la Mejora de la Calidad Educativa, LOCME) approved by Parliament in 2013. The polices implemented to address this issue include:

- Implementing early evaluations (with no academic consequences) in primary school to identify students that are lagging behind and provide them with the necessary support to overcome their difficulties; as well as evaluations at the end of compulsory and upper secondary to uphold the same standards for all students.
- Modernisation of the Vocational Education and Training model, including new modules on sectors with middle- and high-level skill jobs; creating flexible trajectories and building bridges with the academic/general path; making the transition from upper secondary to tertiary/vocational and education training (VET) smoother; and strengthening links with the labour market.

In addition, a new dual vocational model was elaborated jointly by the Ministry of Education, Culture and Sports and the Ministry of Employment, which was approved in 2012. This new model emphasises on-the-job training, thereby involving employers in equipping students with the skills required by the labour market, while at the same time ensuring that students acquire strong foundation skills through the participation of vocational education centres. Despite widespread concerns about whether a model of this kind would work in a country with such a large proportion of small- and medium-sized enterprises (SMEs), it proved a success. The number of students quadrupled from the academic year in which it started (2013/14) to the next. Although this still represents a small number of students in absolute terms compared to educational VET, enrolment continues to increase, and employers are becoming increasingly engaged. SMEs are organising themselves into sectors that share common standards, in order to minimise the high costs that training represents for a small firm, and to create a buffer against the risk of having low retention rates if competitors who do not invest in training attract the students after they have been trained.

Since the number of students enrolled in VET increased by 30% (611 000 to 793 000 students from 2011/12 to 2014/15), the rate of early school leaving experienced

in parallel the most drastic reduction since recording started, decreasing from 26.3% in 2011 to 20% in 2015. However, the rate is still one of the highest in the European Union (18% in 2017), and the implementation of these measures should continue to ensure that this problem is eradicated.

The **Japanese** model of education focuses on the holistic approach to education (cognitive, social, emotional, and physical development of students), and uses a broad range of methods to achieve this goal, such as group activities to develop self-initiative and collaborative learning. Teachers focus both on teaching excellence and participate in a range of other activities, such as supervising extracurricular activities. A common teaching method in primary school is the "Lesson Study", where teachers work together to identify content or skills that are difficult to teach, review academic literature and good practices, and learn from each other through the practice of having one or more teachers observing another teacher use a new pedagogical practice in the classroom. Since 2009, Japan also introduced the Teaching Certificate Renewal System, requiring individuals who currently hold a teaching license to participate in at least 30 hours of professional development programmes every ten years to improve their knowledge and practices.

Japan also focuses on deep and broad stakeholder engagement for the purpose of educational improvement. For instance, boards of education send school supervisors to direct and advise schools regarding curriculum design, and self-assessment is a legal obligation at each educational level up to upper secondary education. Since 2007, a National Assessment of Academic Ability on student and student learning is conducted at Grades 6 and 9 every year. The assessment is only intended for monitoring and improvement purposes. It includes the completion of questionnaires by students, parents and schools to better understand the links between student performance, learning environments, student lifestyles and teaching practices.

In **Canada**, almost 38% of children under the age of 15 are either immigrants or have at least one parent born abroad. Yet schoolchildren from an immigrant background perform as well as non-immigrant children, even when controlling for socio-economic background. This stands in contrast to the results in most other OECD Member countries.

Canada's performance is connected, among others, to its strong track record in educating immigrants. Canada has established various comprehensive introduction programmes and rapid language assessments for newly arrived immigrant children. For example, welcome centres assess the English language and mathematics skills of newcomers, helping schools support new students with the most appropriate courses and encouraging a smooth transition for students. Centres also connect students and families with a settlement worker, offer advice on entry into school and provide information on community resources serving immigrant and refugee families.

In Ontario, the biggest hub for migration in Canada, one of the strengths of the education system is the targeted approach to English learners. Depending on their background and individual needs, students are put into one of two programmes: English as a Second Language, for students who have had age-appropriate schooling in their home country, and English Language Development, for students who have had limited access to education and have not had the opportunity to develop age-appropriate skills in any language. Students might be placed in regular classes with additional one-on-one language support and/or receive intensive tutorial support to provide opportunities for practice and reinforcement of language skills studied in the classrooms. In addition to tailored language support, there is a strong emphasis on the socio-emotional, cognitive and physical well-being of students –

and immigrant children are offered mental health support to respond to their specific social and emotional needs. Parents are also encouraged to communicate with teachers and actively participate in school life. For example, the Toronto school system has created online resources in multiple languages and provides free interpreters to help parents during in-person or phone parent-teacher conferences. In many communities, local agencies help immigrant and refugee families adapt to life in Canada. Some community organisations also offer homework assistance and tutoring for immigrant children or adolescents. The holistic approach to supporting immigrant students and their families has helped these students to thrive in school and achieve high levels of academic success and socio-emotional well-being.

Source: OECD (2018[51]), *Education Policy Outlook 2018: Putting Student Learning at the Centre*, http://dx.doi.org/10.1787/9789264301528-en; OECD (2018[52]) *Education Policy in Japan: Building Bridges Towards 2030*, https://doi.org/10.1787/9789264302402-en; Bilgili, Özge (2017[53]), "The 'CHARM' Policy Analysis Framework: Evaluation of Policies to Promote Immigrant Students' Resilience", http://dx.doi.org/10.1787/164a7643-en; Cardoza, Kavitha (2018[54]), "In Canada's Public Schools, Immigrant Students Are Thriving", www.edweek.org/ew/articles/2018/02/28/in-canadas-public-schools-immigrant-students-are.html; Canadian Paediatric Society (2018[55]), "Caring for Kids New to Canada: School and Education", www.kidsnewtocanada.ca/mental-health/school; Statistics Canada (2017[56]), "Children with an immigrant background: Bridging cultures", www.12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016015/98-200-x2016015-eng.cfm.

Consolidating skills for work and life: Post-initial education and the transition to adulthood

The transition from school to working life, economic independence and active citizenship is a critically important phase in the learning trajectory of an individual. It is strongly influenced by positive and negative experiences in the previous stages, the level of skills acquired and the aspirations that have been built during these stages. Failures at school, under-achievement and the negative feelings projected on the individual that has experienced them, can inhibit a successful start to the learning trajectory in adulthood.

The group of learners most at risk during this transition is those "not in employment, education or training" (NEET). Across OECD Member countries on average, 15% of 18-24 year-olds are NEETs. In Denmark, Germany, Iceland, Luxembourg, the Netherlands, Norway, Sweden and Switzerland the share of NEETs is 10% or less, while it is more than 20% in Chile, Colombia, Costa Rica, Greece, Italy, Mexico, Spain and Turkey (OECD, 2017[31]). Over time, the share of NEETs in the relevant age cohorts is slowly decreasing. Still, this group is in a particularly risky situation. They fall between the institutional frameworks and the respective oversight and monitoring mechanisms of education and the world of work. Young people who are neither in employment nor in education or training are at risk of becoming socially excluded – individuals with incomes below the poverty line and lacking the skills to improve their economic situation. The level of skills acquired during compulsory schooling is closely related to the share of NEETs. In general, the higher a country's percentage of low-performing students at age 15 in PISA, the higher the percentage of NEETs at a later age. For instance, the share of NEETs is lowest in countries with only a small share of young adults with low literacy proficiency (below PISA Level 2) – such as Estonia, Finland or Japan – while it is highest in countries with the highest share of low-skilled students, such as Costa Rica, Mexico and Turkey.

Many NEETs are early school-leavers. They leave the educational system without an upper secondary qualification opening the door to employment and income from work. On average across OECD Member countries, one in five adults has less than an upper secondary level of education (high school degree). In Mexico (64%), Turkey (63%) and Portugal (55%), more than half of 25-64 year-olds reported that they had not attained an upper secondary level of education. Some of these adults have a lower secondary degree at most; others have no formal education degree or even a primary education. Parental background and an accumulation of educational disadvantages strongly influence the likelihood to leave school without a qualification. On average across the OECD, adults with low-educated parents have a 15% chance of attaining tertiary education, according to calculations based on the Survey of Adult Skills (OECD, 2017[6]). By contrast, adults with highly educated parents are on average four times (63%) more likely to obtain a tertiary degree. Furthermore, adults with highly educated parents are six times less likely to have dropped out at the lower secondary level or earlier, compared to those with low-educated parents. The level of educational attainment is also strongly related to labour market outcomes in most OECD Member countries, and adults with a low level of educational attainment are much more likely to face challenges in finding jobs.

Vocational education and training

Across the OECD, many young people leave secondary education and enter adulthood having enjoyed a form of vocational education and training. Traditionally, VET was aimed at providing job-related skills that could be put to immediate use in the labour market. This has led to prejudices and negative perceptions that in some countries still remain. While VET programmes have long allowed graduates to find a job very quickly, longer-term prospects have been hampered due to a lack of strong foundation skills and relatively narrow initial job-related training, making subsequent retraining more difficult. Many countries have responded to this challenge by modernising their VET systems so that students can build strong literacy and numeracy alongside more practical training.

A high-quality vocational learning experience, equipping young people with strong foundation skills and job-specific skills high in demand in the labour market, can provide access to jobs requiring middle and high levels of skills, as well as providing a durable basis for lifelong learning. As a consequence, well-developed VET systems can lead to high levels of employment and the capacity to respond swiftly to changing trends in the demand for skills. Recent OECD work on VET emphasises the importance of providing VET students with high-quality, work-based learning opportunities, through apprenticeships or otherwise.

In order for work-based learning programmes to facilitate smooth transitions into sustained employment, they need to be designed to meet the needs of both workers and employers (Kuczera, 2017[57]). New analysis highlights the essential importance of apprenticeship design (particularly in terms of duration and apprentice pay) and support measures for ensuring that the benefits of investment in apprenticeships exceed costs to employers. International evidence shows that effective apprenticeship design provides greater returns than policies offering financial incentives, such as tax breaks, to employers (OECD, 2018[58]).

Co-operation between education providers, employers and other stakeholders, including trade unions and professional bodies, is essential for developing high-quality, work-based learning programmes (OECD, 2018[58]). The strong engagement of VET stakeholders also encourages more flexible approaches to adults returning to learning. Demand for such

"second-chance learning" can be expected to grow as technology transforms work tasks and countries increasingly look to apprenticeship provision as a means to upskill and reskill older workers. Effective VET systems will recognise that older workers are likely to bring with them wide-ranging skills and knowledge, which should be recognised within more individualised programmes (Kis and Windisch, 2018[59]).

Strong connections between VET decision makers and labour market stakeholders, moreover, helps to align education and training programmes with the rapidly changing needs of the labour market (Álvarez-Galván et al., 2015[60]). With work likely to change more rapidly in the future due to technological change, it becomes increasingly important to provide learners with a strong foundation of basic skills. Strong foundation skills provide resiliency in the face of a dynamic labour market where specific technical skills can be expected to become more quickly redundant than in the past. Countries are also focusing more intently on the ultimate employability of the learner. In Belgium (Flanders), for example, Syntra Vlaanderen (Flemish Agency for Entrepreneurial Training) helps develop the entrepreneurial competencies of vocational learners in anticipation of ultimate self-employment (Kis, 2010[61])

One common reason why vocational education appears unattractive to learners is that VET qualifications are often "dead ends", not leading easily to higher levels of skills. If VET is to attract able and ambitious students, it is essential that clear and well-articulated learning pathways enable progression, up to and including tertiary levels. What's more, prospective learners need to understand what VET has to offer. This calls for proactive career guidance, including rich employer engagement, to challenge stereotypical perceptions of vocational education and training and the working lives to which it is a gateway. Analysis by the OECD has, moreover, highlighted the important role of career guidance in tackling inequality. Young people with the greatest need for high-quality guidance often receive it least (Musset and Mytna Kurekova, 2018[62]).

OECD Member countries take varying approaches to ensure high-quality vocational learning experiences for youth, so as to equip them with strong foundational and job-specific skills (see Box 4.9 later in this chapter).

Tertiary education

For most OECD Member countries, tertiary education is the part of the learning trajectory where young people acquire the higher levels of generic and specific skills needed in the knowledge economy. The tertiary education system trains people to become professionals or highly specialised workers with advanced skillsets. Therefore, the share of tertiary educated young people is commonly seen as a relevant indicator of a country's human capital. At the individual level, a higher education qualification still offers the prospect of significant benefits in employability and earnings, despite the fact that in most countries the enrolment and graduation rates have increased massively. The tertiary education system also plays an important role in developing the social and emotional skills citizens require to effectively participate in the social and political processes of developed economies. Tertiary attainment rates thus also correlate highly with indicators of social capital and social cohesion, such as interpersonal trust and volunteering.

From a lifelong learning perspective, the stage of tertiary education seems to add a lot to a young person's meta-cognitive capacities and the joy of learning. The inequities in adult education participation – the more educated also participate more in adult learning – are very skewed, but they also indicate that tertiary education offers the "learning-to-learn" skills that are so important in the subsequent stages of the learning lifecycle.

From a skills point of view, however, the role of tertiary education in developing skills is more ambiguous than from a qualifications perspective. The results of the Survey of Adult Skills (PIAAC) show that the variation within and between countries in the skills distribution of tertiary graduates is so wide, that the common assumption that a tertiary qualification stands for a globally accepted minimum skills threshold cannot be maintained. The globalisation of tertiary education has not yet led to more harmonisation in the skills equivalent of degrees and qualifications. Even in some countries with highly developed education systems, such as Canada, Israel and the United Kingdom, relatively high shares of tertiary graduates have low levels of basic skills in literacy and numeracy.

The quality of the tertiary education system thus matters significantly. Unfortunately – and despite the importance of tertiary education in the skills development process – there are no valid comparable data on the quality of learning outcomes of graduates beyond the foundation skills assessed in PIAAC. The issue of comparative assessment of students' or graduates' learning outcomes is very contentious in the higher education community, and many institutions and countries resist developments towards comparative assessments. As such, perceptions of quality differences between institutions remain largely based on research metrics and reputations, and not on an assessment of the actual skills that graduates have acquired. Comparative measures of graduate learning outcomes could greatly enhance the ability to assess the value and effectiveness of higher education systems and help governments benchmark the quality of their higher education graduates against international standards (OECD, 2017[63]; OECD, 2017[64]).

As tertiary education is turning into an increasingly common trajectory for youth in OECD Member countries, who view higher education as a pathway to better employment, earnings and well-being, the contribution of tertiary education to skills development becomes more important (OECD, 2017[64]). In this context, the boundary between providing "academic" and "vocational" skills is increasingly blurred as institutions strive to provide technical, professional and discipline-specific knowledge and skills, as well as transferable skills, both cognitive and socio-emotional as well as the skills needed for entrepreneurship. In addition, good linkages between tertiary education institutions and employers, strong quality assurance mechanisms, and adequate supports to promote access to, and completion of, tertiary education are critical components to ensure smooth transitions to changing labour markets for all learners.

There are a number of areas where the performance of tertiary education systems can be improved: skills mismatches, for example (see Chapter 5), which can arise when tertiary education is not well aligned with the skills needs of a country. Such mismatches can take the form of over-qualification when the supply of and demand for tertiary education have expanded beyond the capacity of a country's labour market to absorb the rising numbers of graduates. This is most visible in countries with rapidly expanding tertiary education systems, such as in Korea or Spain. However, even in systems where the mismatch between the level of qualifications and skills is not a major issue, there can be issues with respect to the relevance of the skills acquired. Field-of-study mismatches, for example, arise when students' choices of field of study do not match well with the specific needs for categories of high-skilled workers and professionals. All OECD Member countries have a certain degree of field-of-study mismatch, but this is not seen as a real problem in all cases. High levels of mobility across fields can signal that the education system provides strong transversal and transferable skills that employers are willing to invest in job-specific training, and that experience compensates for lack of credentials. However, field-of-study mismatch can be a serious problem for those graduates who have to accept a lower-level job as a result of lacking field-specific knowledge, and experience

significant wage penalties as a result (Montt, 2015[65]). More generally, increased mobility in the labour market requires tertiary education institutions to develop not only students' field-specific knowledge but also generic, transversal and learning-to-learn skills, to ensure graduates' long-term employability.

OECD Member countries take varying approaches to ensure tertiary education equips students with skills for the knowledge economy and for continued learning in adulthood (Box 4.9).

Box 4.9. Country practices: Providing a good start for lifelong learning in post-initial education

Finland has a high share of young adults attaining tertiary education, a small share of low-skilled adults and a high share of adults with well-rounded skillsets. The government has targeted schemes to encourage ease and efficiency in the transition from education to the world of work. As part of the Youth Guarantee, a commitment made in 2013 by all EU member states to ensure work or study opportunities for youth under 25 within four months of becoming unemployed or leaving education, Finland implemented the Young Adult Skills Programme for young adults aged 20–29 without an upper secondary qualification. This programme gives youth the opportunity to complete a vocational qualification at upper-secondary or post-secondary level through the creation of an additional 1 700 study places. During the two first years of the programme (2013-15), 9 160 students had started the programme in an educational institution and 785 students had started an apprenticeship. The programme emphasises job-specific vocational skills and other essential skills youth need for inclusion in society and provides students with a range of support services both in and outside of the classroom.

In **Denmark**, each of the country's approximately 117 vocational colleges (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.

In the **Netherlands**, the national Digital Agenda aims to promote the effective use of information and communication technology (ICT) in education and skills development programmes as well as the adequate supply of skills for a digital world. Through its Human Capital Agenda for ICT, the government encourages the study and use of ICT in secondary schools and supports regional co-operation of educational and training institutions and labour market stakeholders. The "Pass IT on!" ("Geef IT Door") initiative was set up to increase young people's interest in studying and working in ICT by providing guest lectures from ICT professionals in secondary school. In these guest lectures, professionals talk about working in the ICT sector or address a specific subject, such as big data, cybersecurity or programming. The programme has been successful, with over 250 schools already applying for a guest lecture.

In **Canada**, the Government of Ontario is seeking to improve the development of transversal and job-specific skills in tertiary education.

The Higher Education Quality Council of Ontario (HEQCO) completed two large-scale trials at 20 universities and colleges to measure literacy, numeracy and critical-thinking skills among entering and graduating students. The trials aimed to improve understanding of the skills gap among post-secondary graduates and encourage institutions to teach, measure and credential skills that are highly sought by employers and the labour market rather than discipline-specific content alone. The results showed some evidence of final-year students having higher scores in literacy and numeracy than first-year students, although with considerable variation among programmes. HEQCO recommended that such assessments be implemented for all institutions and students, and be integrated into programme requirements.

To ensure the participation of social partners in curriculum design and development, Ontario requires that public colleges establish a "programme advisory committee" (PAC) for each programme or cluster of programmes. These PACs generally consist of 5 to 12 members and are composed of college staff, students and a "cross-section of persons external to the college who have direct interest in and a diversity of experience and expertise related to the particular field occupation area addressed by the programme" (Ontario Ministry of Training, Colleges and Universities, revised 2009). Surveys of PAC members reveal high levels of satisfaction with their efficacy, and colleges that have transitioned to universities have decided to maintain their PACs, although they are not required to.

Source: OECD (2015[66]), "Building Skills For All: A Review of Finland. Policy Insights in Literacy, Numeracy and Digital Skills from the Survey of Adult Skills", http://www.oecd.org/finland/Building-Skills-For-All-A-Review-of-Finland.pdf; Dutch Ministry of Economic Affairs and Climate Policy (2018[67]), *Dutch Digitalisation Strategy*, https://www.government.nl/documents/reports/2018/06/01/dutch-digitalisation-strategy ; Undervisningsminsteriet (2018[68]), *Om Rådet for de grundlæggende Erhvervsrettede Uddannelser*, https://uvm.dk/erhvervsuddannelser/ansvar-og-aktoerer/raad-og-udvalg/reu/om-reu; Andersen, O. and K. Kruse (2016[69]), "Vocational education and training in Europe – Denmark", http://www.cedefop.europa.eu/en/publications-and-resources/country-reports/denmark-vet-europe-country-report-2016; Weingarten, H. and M. Hicks (2018[70]), "Summary of Findings from HEQCO's Skills Assessment Pilot Studies", http://www.heqco.ca/en-ca/Research/ResPub/Pages/On-Test-Skills-Summary-of-Findings-from-HEQCO%E2%80%99s-Skills-Assessment-Pilot-Studies.aspx; OECD (2018[71]), *Higher Education in Norway: Labour Market Relevance and Outcomes*, http://dx.doi.org/10.1787/9789264301757-en.

Policy recommendations for providing a good start for lifelong learning

In light of the findings and practices above, the following policy recommendations can help countries provide a good start for lifelong learning (Box 4.10).

Box 4.10. Policy recommendations: Providing a good start for lifelong learning

In the early years

- **Remove barriers to accessing early childhood education and care**. The main obstacle that prevents children in low-income families from attending ECEC is affordability. Care hours and proximity of services also affect the choices parents from disadvantaged backgrounds make regarding ECEC enrolment for their children. Providing support in financing and extra care hours – especially for lone-parents – can help remove barriers to accessing ECEC.

- **Strengthen the quality of ECEC services**. Quality in ECEC services for all children must be a cornerstone of policies for early childhood education. The quality of ECEC is a crucial element in children's learning outcomes and is especially important for children from disadvantaged backgrounds, who are generally at higher risk of not being able to obtain quality ECEC services. Attracting high-quality ECEC teachers to impoverished areas is difficult, and constructing and improving ECEC facilities can be challenging if funding is not forthcoming.
- **Support families to raise skilled, lifelong learners**. Policies to support home visits, community outreach and parenting training initiatives can foster greater social cohesion and improved outcomes for children.

In compulsory schooling

- **Identify low performers early in life, through formative assessment**. In order to identify low performers, diagnostic assessments need to be conducted, especially at the beginning of the school year, so that appropriate support can be provided to the students who need it. These evaluations can assess what students know and can do, as well as which subject areas and knowledge they lack, which provides a baseline against which to assess their progress. To track their progress towards learning goals, however, the assessments need to be carried out throughout the academic year. The information on students' performance should then be used to set actionable next steps and to identify the areas that need special attention (OECD, 2012[46]; OECD, 2005[72]).
- **Provide targeted support to students who need it**. Once the students who are struggling have been identified, they require adequate levels of support (OECD, 2016[47]). Providing support for low performing students is likely to help students from disadvantaged backgrounds in particular.
- **Provide additional resources and support to disadvantaged schools**. According to the PISA 2015 results, major discrepancies in the distribution of educational resources between advantaged and disadvantaged schools were reported by school leaders in most OECD Member countries. Many school principals in schools serving disadvantaged learners reported that access to and quality of educational resources, including teaching staff, reduces the quality of instruction provided to their students. Principals in disadvantaged schools reported that the amount and/or quality of resources in their schools negatively affect the schools' capacity to provide quality instruction to a greater extent than did principals in advantaged schools.
- **Maintain high expectations for all**. Low achievers tend to attribute their unsuccessful learning outcome to a low level of ability rather than to a lack of effort. Such ideas are often developed early in life through interaction between parents, teachers and peers, and reinforced during subsequent stages of the educational trajectory. Parents' expectations, attitudes and perspectives can influence their children's attitude toward learning and academic outcomes. This plays a crucial role in setting students' expectations, their ambition to achieve academic goals and their "joy of learning". School leaders and teachers also play a significant role in influencing students' ambitions and expectations about their academic achievement.

- **Attract experienced and highly qualified teachers**. Teachers have the primary responsibility for providing education to students and are best positioned to provide adequate support since they know their students and their circumstances best. However, evidence shows that disadvantaged schools, especially schools in rural and remote areas, are more likely to have teacher shortages (OECD, 2012[46]). In some countries, disadvantaged schools have a smaller proportion of qualified teachers with a university degree than advantaged schools. To attract and retain high-quality teachers in disadvantaged schools, financial and career incentives may need to be provided.

In post-initial education

- **Provide targeted support and career guidance to individuals at risk, particularly those not in employment, education or training**. The transition from initial education to work and adult life can be particularly challenging and risky for those with low levels of educational attainment, experiences of failure and drop-out, accumulated learning disadvantages and low levels of skills. These groups include NEETs, but also other categories such as unemployed youth, women who have left the world of work and immigrants and refugees without strong language skills. Identifying those at risk and providing tailored support, guidance and learning opportunities can help improve transitions to work and adult life.
- **Provide high-quality, work-based learning opportunities**. High-quality, work-based learning provides excellent opportunities to support integration in the labour market. Challenges can exist, however, in ensuring that employers are willing to take on such learners in programmes like apprenticeships. International evidence shows that financial incentives to employers, such as tax breaks and subsidies, are unlikely to be successful on their own. Attention should also be focussed on non-financial measures that improve the cost-benefit balance of apprenticeship to employers, especially for SMEs. These include adjusting key parameters of apprenticeship schemes (notably programme duration), better preparation for apprenticeship and providing support (e.g. remedial courses, mentoring) during apprenticeship. Tertiary education institutions, too, can establish linkages with employers to provide students with relevant work experience before graduation.
- **Develop both basic and technical skills in vocational training**. Education and training play a critical role in equipping learners with skills, knowledge and personal attributes that increase the likelihood of being employed and pursuing occupations of their choice (in other words, their "employability"). This also applies to vocational training. Combining basic skills and practical training for vocational students, especially "on the job", offers the best opportunities for lasting employability, for acquiring positive learning experiences and enhancing the probability of future learning.
- **Equip tertiary students with transversal skills needed for success in the long term**. Transversal cognitive, social and emotional skills and learning-to-learn skills are becoming increasingly important for the long-term employability and continued learning of tertiary graduates. However, many students enter and graduate from tertiary education with gaps in their transversal skills. Increasingly, tertiary education systems must seek to better assess students' transversal skills at the point of entry, and actively develop these skills alongside students' field-specific knowledge.

- **Provide opportunities for "second-chance" education**. Adults who have missed out on the opportunities of the compulsory education system for whatever reason deserve a "second chance" to acquire a meaningful qualification. This can open the door to further learning and/or employment. A successful educational experience, after repeated failures, might also awaken the appetite for learning later on. Furthermore, tertiary education providers must become more effective at tailoring programmes to the needs and constraints of adults wishing to upskill or reskill.

Making lifelong learning affordable and sustainable: Strengthening financing arrangements for adult learning

Developing strong skills early in life is important for the success of both individuals and societies. However, large skills investments during the early years are insufficient in a changing world of work, where digitalisation changes work practices, demands higher levels of skills, but also renders skills obsolete more quickly. As people are expected to stay longer in the labour market in a context of increasing lifespans, there is mounting pressure to ensure they have the right skills throughout life (OECD, 2017[73]). Ensuring all adults have opportunities to upskill is thus a priority, which has become particularly relevant in light of the increasing share of workers in non-standard working arrangements (the so-called "gig economy"). Indeed, workers with short-term contracts or freelancers who lack permanent jobs and whose attachment to an individual employer is limited may face greater barriers to upskill (Katz and Krueger, 2016[74])

Most governments' budgets are insufficient to invest in the training activities that adults will need to regularly maintain their skills, upskill or reskill in order to be employable. Strengthening financing and cost-sharing arrangements has become essential to ensure investments for lifelong learning are sufficient.

The challenge: Raising skills investments and making incentives work

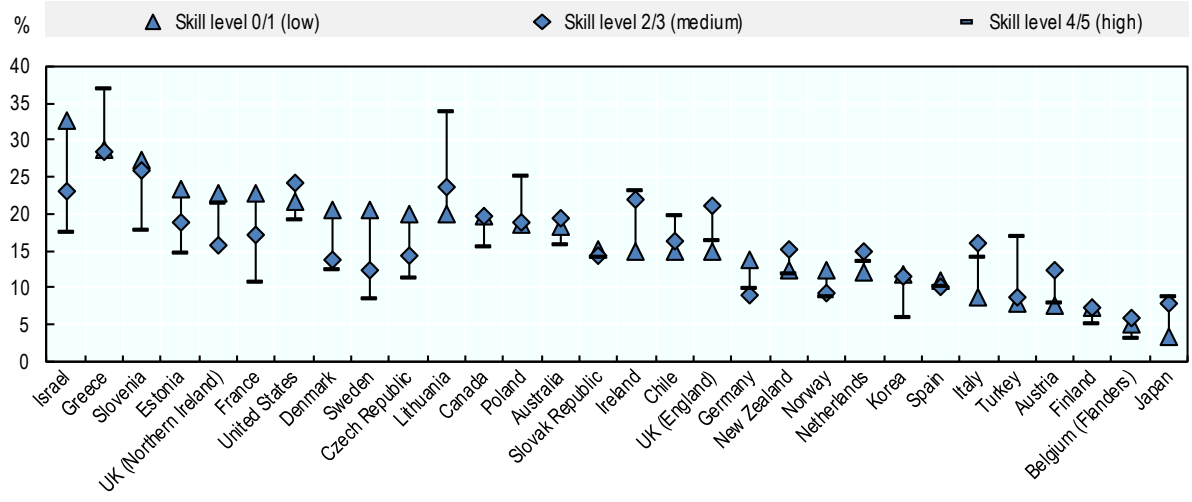
Despite the urgent need to increase participation in adult learning in many OECD Member countries, education budgets are highly concentrated in initial formal education. Even though it is difficult to measure the actual level of investment in adult learning, UNESCO estimates that 42% of countries spend less than 1% of their public education budgets on adult training and education (UNESCO/UIL, 2016[75]). A previous study (FiBS and DIE, 2013[76]) estimates that total spending on adult learning ranges between 0.6% and 1.1% of gross domestic product (GDP). Of this, individuals and employers contribute significantly more than governments (0.1% to 0.2% of GDP from governments versus 0.4% to 0.5% from employers and 0.2% to 0.3% from individuals).

Education and training decisions are subject to market failures such as imperfect and asymmetric information, liquidity and credit constraints, imperfect contractibility and the risk of poaching. These prevent firms and individuals from making optimal skills investment decisions (OECD, 2005[33]). In fact, the low levels of adult participation in training in some countries, combined with the risk associated with insufficient skill levels for both individuals and societies, suggest sub-optimal levels of skills investments. This provides a strong rationale for governments to put in place financial incentives to increase investment in skills over the life course and to better align skills supply with labour market needs.

Policy makers have acknowledged the importance of policies aimed at providing financial incentives to promote the development of skills beyond initial formal education. As shown in Figure 4.6, costs remain a notable barrier for many adults who reported they wanted to engage in learning but could not. For instance, in Israel, Greece and Slovenia, about 25% of adults who wanted to, but did not, participate in training cited cost as an obstacle (OECD, 2017[77]). While in countries like Denmark, Estonia, France and Israel, the low-skilled were most likely to report cost as a barrier, in Greece, Lithuania, Poland and Turkey, the high-skilled were most likely to report cost as a barrier. This suggests that different groups of adults may need differing levels and types of financial support.

Figure 4.6. Cost of training as the main obstacle to participation in adult learning

The share of adults who wanted to participate, but who could not and who cited cost as the main barrier, by skill level, 2012 or 2015



Source: OECD calculations based on OECD (2018[4]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933927989

The potential scope for using financial incentives to steer education and training decisions is vast. They can be used in initial and continuing education; from basic skills to doctoral training; in vocational and academic education; and for the employed as well as the unemployed and inactive (OECD, 2017[73]). They can work either on the supply side (education and training providers) or on the demand side (individuals and employers). The choice of which group financial incentives should focus on requires a careful diagnosis of the problem. While incentives are more often used to encourage more investment in education and training, they can also be used to steer the provision and acquisition of education and training in areas of skills shortage (OECD, 2017[78]).

Good practices

Financial incentives for individuals

Financial incentives can be used to encourage individuals to acquire certain types of skills. The most commonly used approach is to provide subsidies, including scholarships, grants, bursaries, allowances, vouchers and training cheques. These are the most direct

and flexible ways of providing financial incentives, and they can be targeted at the employed, through subsidies for training existing employees, or to the unemployed.

Subsidies to the employed are most often paid directly to employers. However, certain "retention and advancement" programmes target low-skilled workers who are less likely to benefit from employer-sponsored training and aim to increase their chances of retaining their existing jobs and/or moving to a higher quality one. In Germany, for example, workers without qualifications and workers who have spent at least four years in a job unrelated to their initial training may receive funds from the government to retrain in an area with good labour market prospects. Individual time/savings accounts are another, less frequently used, instrument for governments to encourage training (Box 4.11).

Financial incentives targeting employers may focus disproportionately on firm-specific skills, limiting the reallocation of labour across regions or sectors. In contrast, incentives for individuals allow them to develop transferable skills that can be used with different employers and in different contexts, facilitating the reallocation of skills between regions or sectors.

Financial incentives for individuals can be targeted to those most in need, such as individuals in SMEs, who typically face higher training barriers. Investing in training tends to be more costly for SMEs than for larger firms, for which the administrative cost of providing training and the cost of replacing workers while they are in training is lower. With the rise of the gig economy, the number of individuals in non-traditional work arrangements is growing fast. Online platforms facilitate connections between workers and employers and make it easier for people to work on a temporary basis, combine different sources of income and may help increase their autonomy. These new arrangements may thus lower the barriers to entry and exit of work and allow marginal groups to enter the labour force. However, they have significant drawbacks as well, including more restricted access to traditional employer-sponsored training. In this context, incentives targeting individuals can help overcome this barrier.

While new evidence from large online platforms such as Uber and Airbnb suggests these operators may also want to facilitate training to non-traditional workers, especially in the case of repeated or long-term hiring (OECD, 2016[23]), gig work in other contexts may leave workers with few opportunities to upskill. Policies aimed at making training more systematic for non-traditional workers in these arrangements can include direct subsidies or vouchers targeting employees in non-standard contracts, such as part-time employees or freelancers.

OECD Member countries utilise a range of financial incentives for individual learners, including:

- **Subsidies**: Scholarships, grants, bursaries, allowances, vouchers, training cheques, credits (e.g. Belgium [Flanders], Germany, Japan, Portugal, the United States).
- **Savings mechanisms**: Individual learning accounts, time accounts (e.g. France) (Box 4.11).
- **Tax incentives**: Tax allowances, tax credits, tax relief (e.g. Czech Republic, the Netherlands).

- **Loans**: State guarantees, interest rate subsidies, loan guarantees, income-contingent repayments, student loan remission and/or forgiveness (e.g. Australia, Canada, Finland, Sweden, United Kingdom).
- **Study/training leave**: Entitlement to wage, protection from dismissal, retention of entitlements to health insurance and pensions (e.g. Austria, Estonia, France, Germany, Iceland).

Box 4.11. Country practices: Financial incentives for individual learners

France has introduced a time savings account system called "Compte Personnel de Formation" (CPF), which allows employees to accumulate time credits over a number of years and subsequently use these credits for either early/gradual retirement, the take-up of part-time work or training leave. The time savings account has changed significantly in recent years. For example, in 2018, the time entitlement was converted to a grant of EUR 500 annually per employee, for both full- and part-time employees, up to a ceiling of EUR 5 000 for ten years, and EUR 800 annually for low-skilled adults, up to a ceiling of EUR 8 000 for ten years. This enhanced CPF is coupled with the introduction of a quality certification process of training providers, as well as with an online information platform, which is also available via an app, to help learners navigate the offer and pay learning providers directly from their CPF.

Germany provides study leave incentives that focus on the low-skilled and SMEs. The WeGebAU programme, established in 2006, supports low-skilled unemployed and employed persons – as well as employees aged 45 and over – in SMEs wishing to acquire a vocational training degree or to participate in certified continuous training. The participant receives an education voucher with which the Public Employment Service (PES) certifies that certain expenses are absorbed. In addition, unemployment benefits can be paid for the time of the subsidised further training. The PES also pays wage subsidies and social security contributions for low-qualified employees during their training.

In the **United States**, the WorkAdvance programme helps low-income adults obtain more rewarding jobs in high-demand fields with opportunities for career growth (e.g. information technology, transportation, manufacturing, healthcare and environmental remediation). The programme offers formal training that takes into account employers' skills requirements and results in industry-recognised certifications.

Source: Adapted from Ministère du Travail (2018[79]), "Transformation de la Formation Professionnelle", http://travail-emploi.gouv.fr/IMG/pdf/dossier_de_presse_reforme_de_la_formation_professionnelle.pdf; OECD (2017[73]), *Financial Incentives for Steering Education and Training*, https://dx.doi.org/10.1787/9789264272415-en.

Financial incentives for employers

Governments can also target financial incentives at employers to encourage them to invest in training. Targeting financial incentives at employers rather than individuals has the advantage that it is more likely to meet specific labour market needs since employers are better informed about the specific skills their employees need to perform better in the workplace. However, targeting financial incentives at employers may not be effective at reaching disadvantaged workers, such as the low-skilled, and may disproportionately fund firm-specific skills.

The vast majority of incentives for steering the training decisions of employers come in the form of direct subsidies (ILO, 2018[80]). Most of these remain general and do not target specific skills; instead, they allow for flexibility in the identification of training needs. Subsidies that target specific sectors (rather than skills) are common, to achieve various objectives: 1) supporting structural change; 2) overcoming specific training barriers; or 3) supporting strategic sectors and sectors with growth potential.

OECD Member countries utilise a range of financial incentives for employers to engage in education and training (Box 4.12), including:

- **Subsidies and tax incentives**: For work-based learning or apprenticeships, to hire and train the unemployed, to train existing workers (e.g. Australia, Austria, Chile, United Kingdom [England], Netherlands, Poland).
- **Training levies**: Revenue-generating schemes, levy-grant schemes, train-or-pay schemes (e.g. Denmark, Greece, Ireland, Netherlands, Switzerland).
- **Loans**: For firms to invest in training (e.g. Korea).
- **Job rotation**: Temporary replacement of workers in training (e.g. Denmark, Portugal).
- **Payback clauses**: Legal protection to recover at least part of their investment in training in the event that the trained employee leaves soon afterwards (e.g. Germany, Latvia, Netherlands, Poland, Switzerland).

Box 4.12. Country practices: Financial incentives for employers

In **Belgium** (Flanders), the SME Wallet (KMO-portefeuille) programme offers specific incentives to incentivise SMEs to train their employees. It targets SMEs exclusively and is designed to help them grow and become more competitive through skills investments. The SME Wallet covers 30-40% of training costs, depending on the size of the enterprise. SMEs can apply for subsidies on line. Employers determine their own training needs, and there is no targeting element. A recent impact assessment determined that participating firms achieved higher growth than a control group. Other countries have developed similar programmes targeting SMEs exclusively, including the Chèque Formation in Wallonia, Belgium; Profi!Lehre and Weiter!Bilden in Austria; Consortium for HRD Ability Magnified Program (CHAMP) in Korea, the Industry Skills Fund in Australia and the Formação-Ação in Portugal.

Denmark maintains a dual apprenticeship system supported by an employer levy system. All employers, public and private, contribute a fixed amount for each employee (in 2016, around EUR 370 per year) to the Employers' Reimbursement Fund. Levy funds are used primarily to pay apprentice salaries while apprentices are pursuing off-the-job training. Reimbursements may exceed the wage in some cases. There are bonuses for youth who find a paid apprenticeship without assistance. Apprentice wages are set at the sector level through collective agreements and are typically 40-50% of the minimum wage. Apprenticeship programmes consist of a basic (academic) and a main (practical) programme. For the main programme, the student must find a training agreement with a company approved by the social partners. When undertaking the main programme, students alternate between training periods in the company and practical education at college. Overall, 50-70% of the practical education takes place within a company.

In **United Kingdom** (England), an Apprenticeship Grant for Employers is available for those who have fewer than 50 employees, and have not had an employee start an apprenticeship in the previous 12 months. The aim is to support employers in creating new jobs and recruiting new 16-24 year-olds. Eligible employers receive a payment of GBP 1 500 once a qualifying apprentice has completed 13 weeks "in learning", and they can claim up to five grants during the time the grant is available.

In **France,** the Jobs of the Future (Emplois d'avenir) programme encourages employers to hire low-skilled, unemployed youth for a period of three years. The government covers 75% of the wage costs (paid at the minimum wage) and, in return, the employer commits to providing a tutor who will accompany the young person and assist him or her in identifying and participating in appropriate training. The programme focuses on the digital and green sectors, health and social services, and the care, culture and tourism sectors. Similar programmes exist in Italy (Tirocini in Garanzia Giovani) and in the Slovak Republic.

Source: Adapted from OECD (2017[73]) *Financial Incentives for Steering Education and Training*, https://doi.org/10.1787/9789264272415-en; Kuczera, M. and S. Field (2018[81]) *Apprenticeship in England, United Kingdom*, https://doi.org/10.1787/9789264298507-en.

Policy recommendations for making lifelong learning affordable and sustainable

In light of the findings and practices above, the following policy recommendations can help countries make lifelong learning affordable and sustainable (Box 4.13).

Box 4.13. Policy recommendations: Making lifelong learning affordable and sustainable

- **Fund a wide range of training forms and needs**. Education and training needs are highly heterogeneous. The challenges and incentives to undertake further education vary significantly from one group of workers to another and financing policies need to recognise such diversity. Financing instruments should be designed to target specific groups and be flexible enough to accommodate a wide range of training forms and needs.
- **Target funding to the disadvantaged**. Those who need education and training the most are typically those with the least access to it. Efforts should be concentrated in designing effective financing incentives for workers in disadvantaged positions, such as the self-employed, workers in non-standard employment contracts, immigrants and refugees, low-skilled individuals and the unemployed. Schemes that are less targeted often end up favouring the groups already with the best access to education and training (e.g. the highly skilled) and, therefore, subsidise training that would have occurred anyway.
- **Target funding to individuals**. Moving to a scheme where security and benefits, including incentives for training and education, are linked to individuals instead of jobs, can help overcome the low incentives for and barriers to training faced by adults in non-standard work, including the gig economy.

- **Couple financial incentives with other support**. Financial incentives are likely to address only part of the barriers to skills investments that individuals and employers face. Financial incentives to promote lifelong learning should be coupled with complementary non-financial assistance in the form of guidance, counselling, as well as interventions aimed at informing and raising awareness of the benefits of a lifelong learning culture (see the section, "Providing a good start for lifelong learning: Building a strong foundation in early learning and formal education").

Making lifelong learning visible and rewarding: Strengthening systems of skills validation and certification

Acquiring skills over a lifetime is even more rewarding when it is recognised. Validating and certifying skills is a critical part of encouraging lifelong learning.

Assessing skills is a challenge in all education and training systems, as noted earlier. Individuals with the same level of formal qualifications have skill levels that differ significantly (Figure 4.4). The problem is exacerbated by the megatrends discussed in Chapter 3. In addition, the increased use of digital technology at work is shifting the types of tasks workers undertake. Routine tasks – i.e. that involve cognitive or manual tasks accomplished following explicit rules – are declining, as are tasks that do not require the use of ICT technologies. Conversely, non-routine tasks and those involving a high use of technology are growing (Autor, Levy and Murnane, 2003[82]). This increases the requirement for well-rounded skillsets, including cognitive, digital and socio-emotional skills. Some of these skills, such as socio-emotional skills, may be more challenging to assess than specific, narrower skillsets. Globalisation further increases the need for good systems to assess and recognise skills across countries, as it facilitates the mobility of students and workers across borders. Even when workers do not move, outsourcing to workers in other countries is increasingly common in the digital economy (OECD, 2017[83]).

On the supply side, the quantity of learning opportunities outside of formal education has soared in OECD Member countries in recent decades. These opportunities are diverse, with the increased role of private sector providers in the delivery of adult learning and the proliferation of online learning options making it more difficult to assess quality (OECD, 2005[33]; OECD, 2019[5]).

The challenge: Creating better systems to recognise and certify skills

Making skills more transparent through validation and certification of prior learning has multiple benefits. For individuals, it can lead to higher employability, skills use and job satisfaction. It can also be a bridge to re-engage with formal learning by limiting the amount of time and cost required to complete a credential. For employers, having a better understanding of the skills of their employees can help to avoid skills mismatches and lead to higher productivity and reduced staff turnover. For society at large, skills recognition can improve skills matches in the labour market, in turn leading to lower unemployment benefits and higher tax revenue.

The potential for validating and certifying skills acquired through prior learning appears to be significant across OECD Member countries. In Italy and Japan, for example, many low-educated adults have literacy proficiency levels on par with medium- and even highly-educated adults (Figure 4.4).

Assessing and certifying skills is thus increasingly needed, but it can be complex and costly. Processes to recognise prior learning often involve several assessment methods, ranging from reviews of portfolios, written examinations and interviews or face-to-face exercises to assess skills such as socio-emotional skills (Kis and Windisch, 2018[59]) It is critical to make such processes more accessible and efficient for all parties involved.

Learning opportunities outside of initial formal education often fall outside formal education and nomenclature systems such as national qualifications frameworks. This can make it difficult for employers, formal education and training providers and prospective learners to understand and value (OECD, 2014[84]).

Good practices

Two broad systems of skills assessment and recognition are used in OECD Member countries: one involves assessing and validating skills obtained through prior learning to issue a formal education qualification, while the other is competency-based and involves awarding non-formal credentials.

Recognising prior learning for the purposes of granting a formal education qualification is a long-standing approach, which consists of clarifying what formal qualifications entail in terms of what students can do in practice – the skills they are expected to have upon completion. Combined with various mechanisms for students to demonstrate the skills they have, these approaches help identify skills that individuals already have that can count towards the award of a credential. In this context, national qualifications frameworks and supranational tools such as the European Qualifications Framework and the European Credit Transfer System (ECTS) can be useful. This approach has several benefits, from enabling further learning in a time- and cost-efficient manner to facilitating mobility of learners across institutions at a given level (e.g. in tertiary education), between levels of education (e.g. secondary to tertiary education) and between countries (e.g. for international students but also highly skilled migrants seeking access to regulated professions in their host country).

Some countries have developed and scaled up such systems. For instance, Portugal has developed standards to recognise skills acquired by adults outside of formal education that are equivalent to those required to obtain an upper secondary diploma and has hundreds of adult-learning centres across the country with staff dedicated to helping adults undergo such a process (OECD, 2018[22]). In the United States, processes to identify equivalencies between the skills provided by non-formal learning programmes, for instance, delivered by employers, and post-secondary credentials are well developed. Organisations such as the American Council on Education, which reviews non-formal programmes and makes recommendations for recognition, play an important role in such a system (OECD/ELS, 2018[18]; OECD, 2019[5]).

The second approach is competency-based and consists of assessing and recognising skills acquired through tools other than the award of formal credentials. The development of open badges and credentialing platforms, as well as “nanodegrees” or “micromasters” developed by providers of massive open online courses are examples of this approach. These tools aim to recognise a broader range of skills than those provided through formal education. When it comes to MOOC-based credentials, they can also be very specific, around a particular set of technical skills and knowledge. Several large online platforms that facilitate the hiring of freelancers also offer online skills tests, where freelancers can take multiple-choice quizzes on various skills, across a variety of skills domains. Some of the features of online platforms, where employers can provide feedback on the quality of

hires, can help individuals who otherwise face challenges in signalling their skills to employers, e.g. contract workers with limited experience or from emerging economies (Lehdonvirta et al., 2018[26]); (Agrawal, Lacetera and Lyons, 2016[85]).

In some countries, public employment services are initiating approaches to test clients' skills acquired outside of formal education (Box 4.14).

Box 4.14. Country practices: Skills assessment and recognition

In **Germany**, the federal employment agency, together with the Bertelsmann Foundation, has developed a new test for unemployed persons without a vocational training certificate and refugees, called MYSKILLS. The test consists of 120 questions followed by an assessment interview and is designed to help jobseekers without formal vocational qualifications to better demonstrate their vocational skills. Currently, this computer-based test exists for eight occupations and is offered in German, English, Russian, Turkish, Farsi and Arabic. Over the course of the year, the test will be expanded to include 30 occupations.

South Africa has a well-established system for recognising prior learning. In place since the start of democracy in 1995, the recognition of prior learning has been important to redress the inequalities created by the apartheid system by enabling validation of skills for those who had been denied access to quality formal education. A new policy recognising prior learning for artisans proposes to provide full artisan trade qualifications to non-contracted learners who pass a national trade test - a policy which should help to address shortages in the skilled trades.

Source: OECD (2017[20]), *Getting Skills Right: Good Practice in Adapting to Changing Skill Needs: A Perspective on France, Italy, Spain, South Africa and the United Kingdom*, https://doi.org/10.1787/9789264277892-en; OECD/ELS (2018[18]), "Policy Questionnaire: Readiness of Adult Learning Systems to Address Changing Skills Needs", internal document.

Firms are also developing their own skills assessment systems as well as skills badges and certifications, relying less on credentials. At this stage, the prevalence of these practices is not well known, although it appears to be growing, mostly driven by large private sector ICT firms, such as IBM, Microsoft and Oracle (OECD, 2019[5]). Some firms combine short-term learning opportunities and assessment practices, as shown by the example of a tool developed by Google to help learners use Google Analytics, which has been implemented as part of a tertiary-level education programme (Staton, 2016[86]). However, small-scale employers with no capacity to conduct skills assessments in-house or to pay for other market-based solutions may continue to rely on credentials.

The proliferation of assessment tools raises questions about how to ensure their acceptance and quality. Assessment tools and the qualifications they award must be recognised by employers. Where the tools and qualifications become too numerous or diverse, employers may not recognise the quality, validity or value of the credential. Tools should also be designed to ensure assessments: 1) effectively test the skills of individuals, rather than associate the simple participation in training activities with the acquisition of skills; 2) are broad enough to test various relevant skills; and 3) are inclusive enough so as not to put certain groups at a disadvantage (e.g. due to lack of access or experience with the assessment technology).

These two approaches – to recognise skills towards the award of a formal credential, or through new forms of skills recognition – are not mutually exclusive. Individuals may use

them either sequentially or simultaneously, based on their needs. In both cases, improving the credibility of skills assessment and recognition systems requires designing tools that are relevant to employer needs, relevant to learners' needs, embedded in national qualifications frameworks where possible, and have mechanisms in place to avoid various risks such as fraud and privacy concerns. The OECD's Education and Skills Online is an assessment tool that can be helpful in this context. The tool allows individuals to take a test and to obtain results that are linked to PIAAC measures of literacy, numeracy and problem solving in technology-rich environments.

Finally, technology has the potential to transform how people's skills are recognised and validated. Globalisation and international mobility have heightened the need for more universally recognised, validated and secured certification of skills (Gräther et al., 2018[87]).

Blockchain technology could offer a solution to record an individual's learning, securely through cryptographic methods, in a verifiable and permanent way. It could provide a practical solution for issuing, validating and sharing certificates among learners, educators and employers without the need for a trusted intermediary (such as an accreditation body) (Chen et al., 2018[88]). Although still in its infancy, Blockchain has applications in the world of learning from individual to national and international levels. It could be used to store credentials and certificates from all forms of learning, enabling adults to create a personal portfolio that is recognised and valued in the labour market (Clark, 2016[89]). Blockchain has already been used for issuing digital certificates (MIT Media Lab, Open University, University of Nicosia), in-house certificates within workplaces (Sony), and verification of e-portfolios (Indorse). However, the application of Blockchain technology in lifelong learning systems faces several challenges. These include not only data-regulation issues but institutional and governance arrangements to develop common standards and create and grant certification (Grech and Camilleri, 2017[90]).

Policy recommendations for making lifelong learning visible and rewarding

In light of the findings and practices above, the following policy recommendations can help countries make lifelong learning visible and rewarding (Box 4.15).

Box 4.15. Policy recommendations: Making lifelong learning visible and rewarding

- **Move to a competencies-based approach to formal qualifications**. This can help to achieve greater transparency and homogeneity of diplomas issued by different educational institutions, and facilitate modular learning that can better meet the specific needs of individuals and employers. Participation of employers in the design and review of qualification frameworks is important to achieve recognition.
- **Encourage the development of certificates for skills acquired outside initial formal education**. Governments, education and training providers and employers can co-operate to define standards and good practices for certification to move towards a more reliable assessment of the skills people have.
- **Integrate certificates earned through non-formal and informal learning in national qualification frameworks**. This would need to be on a case-by-case basis and conditional to the respect of various standards to provide better information to employers and education providers. Whether certificates can lead

to credit granting or other methods to obtain a formal qualification would be left to the discretion of education providers.

- **Harness technology to record and validate people's skills**. Globalisation has heightened the need for more universally recognised, validated and secured certification of skills. Although still in its infancy, Blockchain technology has the potential to record various forms of learning, enabling adults to create a personal portfolio that is recognised and valued by employers and educators. Countries could investigate how technologies like Blockchain can be utilised to make lifelong learning visible and rewarding.
- **Work towards international harmonisation**. Governments could work together to harmonise recognition and certification of skills practices at an international level.

Making lifelong learning accessible and relevant: Responding to the needs of individuals and employers

In addition to the factors explored in previous sections, boosting interest and participation in learning throughout life requires that learning opportunities be both accessible and flexible, in order to suit learners' needs.

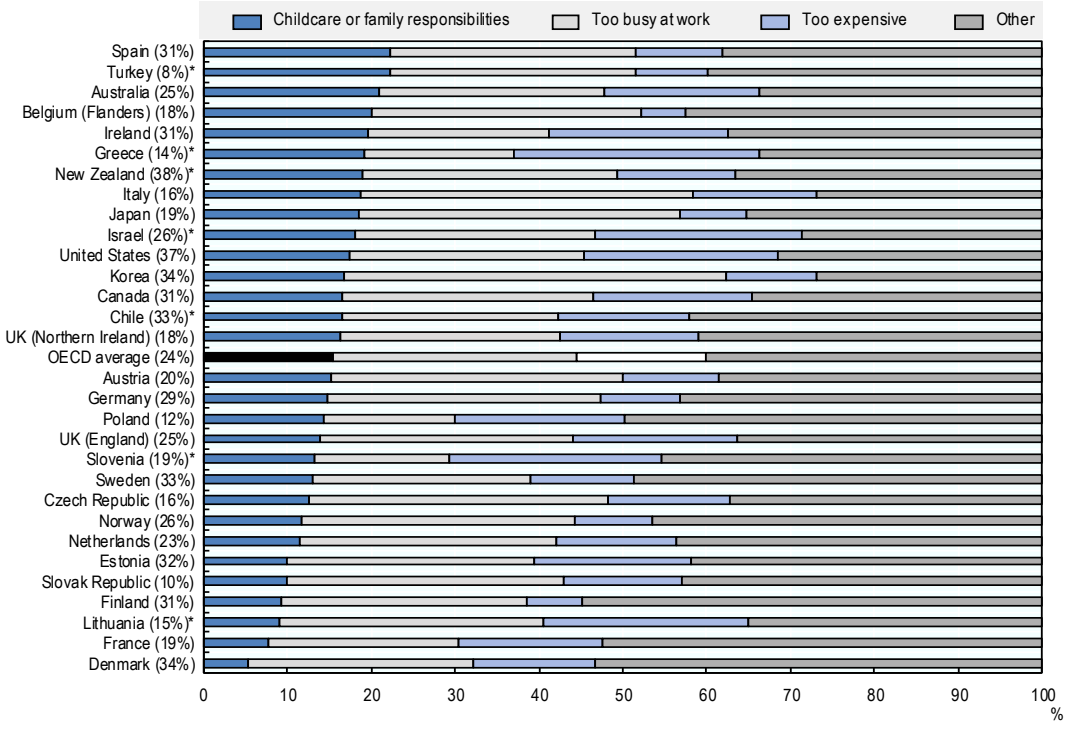
The challenge: Designing more flexible learning opportunities

Across OECD Member countries, participation in adult learning is often below national targets, and lowest for the adults most in need of developing their skills (like the low-skilled) (see the section, "Raising aspirations for lifelong learning: Setting the vision and supporting informed learning choices"). Low motivation to learn and a poor understanding of the benefits of and opportunities for learning are major reasons for this.

However, the responsiveness of education and learning opportunities to individuals' and employers' needs also affect participation. The lack of accessibility and flexibility of lifelong learning systems can be a major impediment adults' participation in learning. This is partly due to adult-learning arrangements being an extension of the formal education arrangements or institutional frameworks designed for youth in compulsory education, without adaptation to the needs and interests of adults.

An analysis of data from PIAAC reveals that time constraints related to work and/or household responsibilities were the most important barriers for 25-64 year-olds to engage in formal or non-formal education or training (OECD, 2017[31]) (Figure 4.7). When asked to state why they did not enrol, on average across OECD Member countries, 29% of respondents indicated that they were too busy at work. A further 15% of respondents never started the learning activity because of childcare or family responsibilities. Thus, for 44% of respondents, the burden of work or family seemed to leave no time for learning activities. In particular, the presence of young children in the household of young adults (25-34 year-olds) has a negative impact on the adult education participation rate. The highest differences in participation rates between those with and without young children (20 percentage points or more) are found in Austria, Greece, Ireland, Italy, Japan, Singapore, the Slovak Republic, Spain and Turkey. In countries with higher participation rates, the difference tends to be smaller.

Figure 4.7. Reasons preventing adult participation in (more) formal and/or non-formal education



Note: Percentage in parentheses represents the share of 25-64 year-olds who wanted to take part in (more) learning activities but did not start. To avoid having too many categories, the category "Other" includes five reasons cited for not starting the activity: did not have the prerequisites; lack of employer's support; the course or programme was offered at an inconvenient time or place; something unexpected came up that prevented me from taking education or training; other.
* Reference year is 2015; for all other countries and economies, the reference year is 2012.
Source: OECD (2017[31]), *Education at a Glance 2017*, Table C6.1b., https://dx.doi.org/10.1787/eag-2017-en.

StatLink https://doi.org/10.1787/888933928008

Additionally, factors related to how the learning activities were organised prevented a total of 30% of the respondents from participating: for example, the time or place for the delivery of the course was inconvenient (12%), the education or training was too expensive (15%), or they lacked the prerequisites (3%). Some 7% of respondents cited lack of support by their employer (OECD, 2017[31]).

These data suggest that even when adults were interested or motivated to engage in learning activities, the available opportunities simply did not allow them to do so. Barriers relating to the way education and training opportunities are organised seem to be an even greater obstacle than financial barriers.

Good practices

Providing flexible learning opportunities that are compatible with individuals' daily lives can increase participation in adult education and training. To remove situational, time and geographical barriers, innovative and effective adult-learning programmes, such as online and distance learning, flexible learning arrangements, such as modular classes, evening, weekend and part-time courses may reduce the non-financial barriers to adult-learning participation.

The most effective strategies to make adult-learning opportunities more accessible and adapted to the needs of adults include:

- **Recognition of existing skills**: To ensure that learning is as efficient as possible, many OECD Member countries have developed means to take account of existing knowledge and skills in adult learning. Approaches include admitting learners into a programme when they are well placed to benefit even if they lack formal qualifications; reduced programme duration; and progression directly to a concluding assessment (Kis and Windisch, 2018[59]) (see the section, "Making lifelong learning visible and rewarding: Strengthening systems of skills validation and certification").
- **Flexible time arrangements**: In many OECD Member countries, part-time learning opportunities are offered, which allow adults to combine work and learning at the same time. Such adult education programmes can be held on off-hours, at night or on weekends, facilitating the participation of adults who may be busy during the day with work or family responsibilities.
- **Modular course design**: Replicating degree programmes designed for full-time students for the purpose of part-time study has been shown to be ineffective as such programmes take too long to complete. Adult learners are not always interested in the full package but want to be in control of selecting specific pieces of information or skills they need to acquire. Modular approaches to course design can allow learners to address their specific learning needs, and can "stack" or accumulate credits towards a formal qualification.
- **Learner-oriented instructional design**: Programmes and courses intended for adult learners should be designed according to insights from what is known about the psychology of adult learners. The instructional design of course materials and resources should facilitate self-paced learning, where learners take responsibility for their own learning. However, not all adult learners have the meta-cognitive skills to steer their own learning process, which requires making available appropriate guidance and meta-cognitive skills training to support learners.
- **Credit transferability**: Adults are more interested in the objectives, content, purpose and outcomes of learning opportunities than in the specific institution or organisation providing programmes and courses. In a very complex learning market, rather than following a pre-designed linear track, they will select and combine units of learning, such as modules, wherever they are offered. Credits or other forms of certification of modules should, therefore, be transferable and stackable across learning providers. Adult learners should not be confronted with complex issues of credit recognition.
- **Demand-driven programming**: Institutional providers of adult learning seldom escape the temptation to program courses and design learning objectives and materials according to what they think is essential or what is easily available. However, effective adult learning requires that curriculum and instructional methods be rooted in what adult learners demand, and what they think is essential to meet their learning needs.
- **Usability of learning**: For adult learners, it is essential that the learning process is closely related to and situated where the learning need has originated. Proximity between the learning process and the place where what is learned can be put to

use is thus important. This is typically facilitated through workplace learning or learning arrangements involving close interaction with the workplace.

- **Harnessing digitalisation and technology**: Information and communication technology can facilitate open, online education, personalised and adaptive learning, free up "class time" for exercises and facilitate interactions across locations. The use of big data for instruction and management has the potential to improve systems and processes. However, technology is not a panacea and may be relatively less beneficial for disadvantaged groups and those with low ICT skills. Policy makers and institutions should follow and expand the evidence on harnessing ICTs for lifelong learning.

In particular, digitalisation provides a range of opportunities to make learning more flexible and accessible for adults, including through open education.

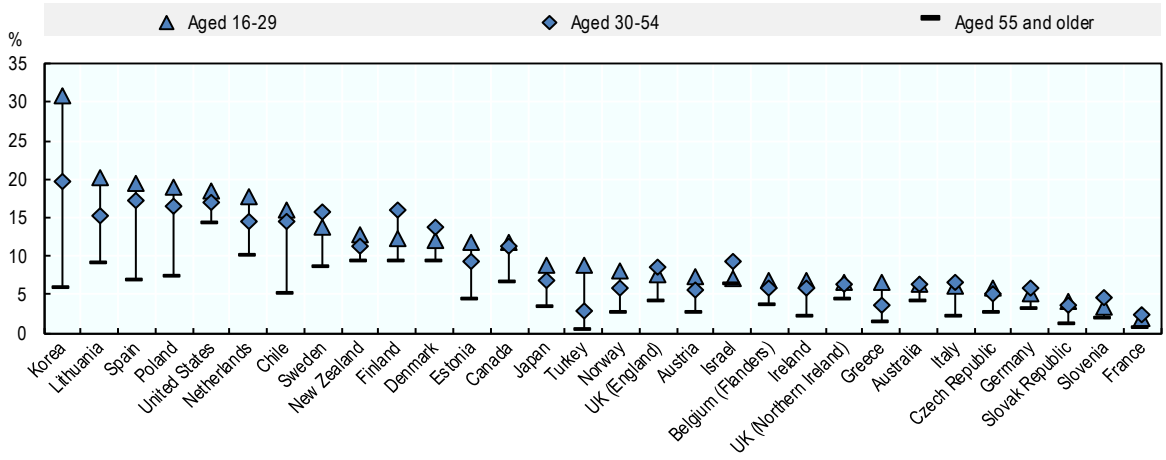
Open education, which offers time- and place-independent learning can be more flexible and sensitive to adults' time constraints than traditional face-to-face learning. Open universities have existed for a long time, but digitalisation has expanded the possibilities of open education significantly. Open education using digital technologies provides a new level of flexibility to adults combining work and study (OECD, 2019[5]). However, despite the low costs of accessing open education, participation patterns mirror those of standard adult education and training – highly educated and highly skilled adults are most likely to participate. Still, the potential that open education and MOOCs offer to firms to train their workers has not been fully realised, although initiatives are developing in this area.

The *OECD Skills Outlook 2019* (OECD, 2019[5]) examines participation in distance education using data from PIAAC which includes questions on participation in courses "which are similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom." Since most countries were surveyed in 2012 at a time when massive open online courses were in their infancy, it is likely that responses mainly capture more traditional forms of open education, such as online components of formal education. Uptake of MOOCs and other forms of open education has almost certainly increased since then. Regular registration and monitoring of online learning are needed to keep track of these developments (OECD, 2019[5]).

In countries covered by the PIAAC survey in 2012 and 2015, participation in open education varies considerably across countries, from almost 20% in Korea, a country with a long and large experience with open education, to less than 2% in France. In most countries, young people are more likely to participate in open education than older adults (Figure 4.8). Yet these data also show that in many countries there still is much room for expansion and increased participation in open education (OECD, 2019[5]).

Figure 4.8. Participation in open education by age

The share of the population having participated in open or distance education in the last 12 months prior to the survey



Note: In the Survey of Adult Skills (PIAAC) questionnaire, open or distance education is defined as not leading to a formal qualification. It covers courses which are similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom. These questions were not posed to individuals aged 16 to 19 in formal compulsory education.
Source: OECD calculations based on (2018[4]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933928027

Virtual learning environments such as video games, simulations and virtual worlds can better motivate students in their learning, facilitate situated-learning experiences that were not possible before (e.g. small schools in remote regions), and generate new avenues for interacting with others to practice particular skills (Merchant et al., 2014[91]; OECD, 2016[92]). Examples may include dissecting animals in a virtual lab or practising certain skills in real-life virtual situations (OECD, 2018[93]).

Digital learning systems that adapt content to learners' individual responses are improving their capacity by building on cloud computing and educational data mining (Oxman and Wong, 2014[94]). As these systems upgrade and find their way to the classroom – being integrated into learning management systems, for example – teachers can free up time to better plan activities and enhance feedback to students. Increasingly, advances in artificial intelligence will further allow for wider, more refined assessments, such as recognising students' emotional reactions to the task at hand and opening new ways to facilitate student collaborative learning (Luckin, Holmes and Forcier, 2016[95]; OECD, 2018[93]).

Technology can also be leveraged to reach out to learners and/or those who support them more effectively. There are a number of existing successful examples already. These include text messages to parents to engage them in children's learning by informing them about the number of missed classes, providing students with career guidance and relevant tips for college admission, or "mindset messages" to help students cultivate positive attitudes towards themselves, their peers and school. These are low-cost and effective interventions that yield positive results (Escueta et al., 2017[96]; OECD, 2018[93]).

However, technology is not a panacea for flexibility and relevance in lifelong learning. Citizens often have privacy concerns, and the benefits of technology will be lower for disadvantaged groups, especially if they lack foundational digital and other skills. Also, the evidence on effective ways to harness ICT for lifelong learning is still emerging. Policy-makers have an important role to play in improving this evidence through high-quality research and experimentation.

OECD Member countries have taken various measures to make education and training more flexible and accessible (Box 4.16).

Box 4.16. Country practices: Making adult learning more flexible

Denmark has one of the highest levels of participation in adult education and continuing training. In 2016, adult participation in both formal and non-formal education was over 50% for adults aged 25 to 65. These high participation rates reflect a long tradition of adult learning in Denmark and the country's flexible system, among other factors.

In 1996, Denmark introduced an education system for adults that is parallel to the regular system: the adult and continuing education (ACE) system, giving adults the chance to obtain secondary and/or higher education degrees. Much of the provision enables learners to combine learning modules from a diversified range of provision (including non-formal educational programmes that take place in independent institutions) and across different subjects. Individuals obtaining a vocational qualification in Labour Market Training Centres (*Arbejdsmarkedsuddannelse*), for example, can choose from a wide range of vocational training courses, as well as subjects provided by the general education system.

This allows learners to tailor education and training programmes to their individual needs and interests. The provision of education and training can take the form of short vocational training programmes (either open workshops or programmes organised in classes, the duration of which varies from half a day to six weeks), usually taking place during working hours, but may be organised in the evenings or weekends. It is also possible to organise training activities at the workplace or in the form of distance learning. This flexibility and diversity of learning help address barriers to participation for adult learners with limited time due to work or household responsibilities.

Ireland's WriteOn programme (active since 2008) is part of a broader distance learning service managed by the National Adult Literacy Agency (NALA). It aims to provide quality, free, confidential literacy support on line and by telephone with qualified tutors. Specifically, the programme provides an online skills assessment and flexible learning opportunities to facilitate both the acquisition of literacy skills and accreditation for adult learners at Levels 2 and 3 of the National Qualifications Framework of Ireland.

The programme offers an online tool allowing individuals to undergo a step-by-step process to assess their skill levels. It then provides access to learning resources and individualised tutoring on a free telephone line, allowing people to study at their own pace and in their own time to improve basic foundation skills of literacy and numeracy, while simultaneously developing new digital literacies.

Data collected by NALA suggest that there are 10 000 calls annually from adults seeking advice on how to upgrade their skills; 32 000 learners have created an online learning account; and 2 500 learners went on to obtain 14 500 national certificates at Levels 2 and 3.

Source: Desjardins, R. (2017[97]), *Political Economy of Adult Learning Systems: Comparative Study of Strategies, Policies and Constraints,* Bloomsbury; Danish Ministry of Education (2018[98]), "Adult vocational training", http://eng.uvm.dk/adult-education-and-continuing-training/adult-vocational-training; OECD (2019[12]), *Getting Skills Right: Future-ready Adult Learning Systems,* https://doi.org/10.1787/9789264311756-en ; CEDEFOP (2012[99]) Vocational education and training in *Denmark*, www.cedefop.europa.eu/files/4112_en.pdf; OECD (2018[22]), *Skills Strategy Implementation Guidance for Portugal: Strengthening the Adult-Learning System*, Box 3.10, http://dx.doi.org/10.1787/9789264298705-en; NALA (2018[100]), "NALA's Free Distance Learning Service", www.nala.ie/what-we-do/improve-literacy/distance-education.

The challenge: Developing relevant skills

Investing in developing skills is beneficial to the extent that the acquired skills are relevant to the needs of economies and societies. Cognitive foundation skills, non-cognitive social and emotional skills and meta-cognitive "learning-to-learn" skills are quite transversal. They are necessary for the development of all other generic and specific skillsets, and will likely become more important as technology and artificial intelligence fundamentally transform the world of work and participation in social life. But when more specific skills are concerned, the concept of "relevance" becomes more important.

In many education systems, trajectories of individuals through the school system and in higher education are very much determined by the preferences and choices made. Various factors come into play when students and their parents make such decisions, and economic and social factors, such as labour market information, are only partly taken into account. Not so long ago, simplistic ideas about "human resource planning" suggested that labour market needs could be predicted with a high degree of accuracy, so this information would be used by young people making their educational choices. Too often, this has led to failures. Even today, it is still difficult for countries to predict, say, the number of medical doctors they will need over a period of six or seven years, the time it takes to train one. The choices made by individuals in education also clearly lead to various forms of mismatches (see Chapter 5). The lack of alignment between skills supply and labour market demand continues to fuel dissatisfaction and concern among employers and policy makers.

In adult education and training, recent OECD research suggests that there are big differences between countries in terms of the overall alignment of adult learning to labour market needs (OECD, 2019[12]). The assessment of skill needs is an important first step in avoiding and tackling skills imbalances. Firms that regularly take stock of their current and future skills needs are better prepared to plan their training and hiring activities. Across European OECD Member countries, on average 69% of firms assess their future skill and competence needs. In Denmark, Hungary, Italy and the United Kingdom, more than 80% of firms report assessing their future skill needs, whereas this is the case for less than 50% of firms in Latvia and Poland. Another important aspect of alignment at the firm level is the degree to which there is an overlap between the identified skill needs of the company and the training activities offered. When comparing the top three skills that enterprises report as important for the development of the firm to the three most important skills targeted in training activities, there is only a complete overlap for 13% of firms across European OECD Member countries.

Training for individuals with particular learning needs is also important to align adult learning with the skills needed in the labour market (OECD, 2019[12]). At the individual level, adults whose skills do not correspond with those required in the labour market have some of the strongest training needs. However, workers in jobs with a significant risk of

automation participate less frequently in adult learning than other workers. The same observation holds for workers in easy-to-fill occupations (i.e. occupations for which the demand is lower than the supply): in the majority of OECD Member countries, participation in job-related adult learning is lower for workers in easy-to-fill occupations than for workers in hard-to-fill occupations. Furthermore, about 34% of workers in OECD Member countries with available data say that they would need more training to cope with their current duties. However, only 60.3% of these workers with self-reported training needs participated in training opportunities in the previous 12 months.

Good practices

Policy makers in OECD Member countries have taken a variety of approaches to ensure that education systems supply the skills needed in society and the economy, and minimise skills mismatches. These approaches include:

- Developing high-quality foundation skills for all students in formal education, including by implementing programmes that focus on transversal and increasingly important skills (for example, digital skills, problem-solving skills, creativity, etc.).
- Developing flexible arrangements for learners that enable them to transfer more freely between work and training, and between training programmes and providers, to minimise the time investment required to develop relevant skills.
- Developing specific technical skills within workplaces or in very close collaboration with them. Work-based learning arrangements provide much better opportunities to develop such skills.
- Designing adult-learning policies and programmes in line with labour market needs, by feeding information from SAA exercises into strategic planning, training standards, and individual programme design.
- Steering adult-learning investment toward in-demand skills, by restricting training options to those that are in line with skills needs, providing financial or non-financial incentives to invest in certain in-demand skills, and giving information and guidance that stresses the importance of these skills.
- Assisting workers in sectors undergoing structural change, by using SAA information to identify individuals with skills that do not correspond to those in demand in the labour market, and implementing policies to focus efforts on these individuals.

One specific form of work-relevant training utilised in some OECD Member countries is adult apprentices. These are well established in Australia, Canada, the United Kingdom and the United States, and are now emerging in other OECD Member countries. Interest reflects the growing need to retrain, which reflects the changing character of work and the strength of the apprenticeship brand. The design of apprenticeships aimed at adults often differs from that aimed at young people. Older workers often bring stronger literacy and numeracy and relevant technical knowledge with them, enabling the more rapid development of productive skills. This changes the cost-benefit balance for employers, which often has implications for apprenticeship duration and apprentice pay (Kis and Windisch, 2018[59]).

Countries have taken a variety of approaches to make adult learning relevant to skills needs, to minimise skills mismatches across the working lives of adults (Box 4.17).

Box 4.17. Country practices: Making lifelong learning relevant

The **Swedish** Higher Vocational Education (HVE) programmes provide post-secondary vocational education that combines theoretical and applied studies in close co-operation with employers and the industry sector. The programmes are oriented towards explicit labour market needs and allow adult learners to put learning into practice through work-based learning. The Swedish government established HVE in 2001 to fill a gap in the Swedish education system by providing non-university higher education programmes in specific, in-demand fields. The main task of the regulatory authority (the Swedish National Agency for HVE) is to analyse the demand for qualified workforce in the labour market, decide which HVE programmes will be offered and allocate public funding to the corresponding education providers. Employers and industries are involved closely in the design of the courses and participate actively by giving lectures and joining in projects. Each year, they also release evaluation results, which are strong overall: seven out of ten students have a job before graduating, and nine of ten students are employed or self-employed one year after graduation.

In **Korea**, the government, in co-operation with Industry Skills Councils, use labour market information to develop national occupational standards. These standards are applied to vocational education and training qualifications to ensure that they meet the needs of the workplace. At the same time, employers are encouraged to use these same standards in their human resource management.

In **United Kingdom** (England), apprenticeships are a common way to train incumbent workers, and in the recently reformed apprenticeship system groups of employers (called trailblazers) are responsible for setting apprenticeship standards within their sectors. This system was introduced to ensure a better alignment of the content of apprenticeship programmes to the needs of the workplace.

In **Estonia**, registered job seekers can access training opportunities through a system of training vouchers (*Koolituskaart*). These training vouchers have recently also been made available for certain groups of employees, under specific conditions. In the case of low-wage older workers and low-skilled workers, the condition to use the training vouchers is that the training has to be related to ICT skills or skills identified as being in shortage by the Estonian Qualifications Authority. Estonian employers hiring job seekers for certain occupations that are in shortage and of growing importance in the labour market can receive training grants (recruitment training grants - *Koolitustoetus töötajate värbamiseks*) to partially compensate for the cost of training new hires.

Source: CEDEFOP (2012[99]), *Vocational Education and Training in Denmark*, http://www.cedefop.europa.eu/files/4112_en.pdf; Eurofound (2018[101]), "Denmark: Social partners welcome new tripartite agreement on adult and continuing education", https://www.eurofound.europa.eu/publications/article/2018/denmark-social-partners-welcome-new-tripartite-agreement-on-adult-and-continuing-education; (Eurostat, 2016[102]), *Adult Education Survey 2016,* https://ec.europa.eu/eurostat/web/microdata/adult-education-survey; OECD (2018[58]), *The Future of Education and Skills - Education 2030,* https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf; OECD (2019[12]), *Getting Skills Right: Future-ready Adult Learning Systems*, https://doi.org/10.1787/9789264311756-en.

Policy recommendations for making lifelong learning accessible and relevant

In light of the findings and practices above, the following policy recommendations can help countries make lifelong learning accessible and relevant (Box 4.18).

Box 4.18. Policy recommendations: Making lifelong learning accessible and relevant

- **Put the needs of adults and employers at the centre of adult education and training design**. Too often adult-learning programmes are modelled on those for children and youth, with little attention given to the unique needs of adults. Education and training providers should develop programmes adapted to adults' time, financial and other constraints. Learning programmes should be modular and transferable, and curricula and teaching methods designed according to adults' learning needs and styles.
- **Tailor learning to the original learning need and context**. Adults typically learn more effectively and efficiently when the learning process is closely related to the place where the pressure to learn originates, which is most often the workplace. As a consequence, learning opportunities should be developed responsive to the world of work.
- **Address any gaps in adults' foundation skills**. Foundation skills are the building blocks for success in work and in life. Transversal skills such as literacy, numeracy, problem-solving skills, digital skills, creativity, etc. are critical for success in most aspects of work and life, including continuous learning. Schools and tertiary education should focus on developing these foundations first and foremost.
- **Harness technology to make learning more accessible and tailored**. Technology is transforming not only the skills people need but how they learn. Open education, which offers time- and place-independent learning can be more flexible and sensitive to adults' time constraints, and expand access to remote communities. ICT can facilitate personalised and adaptive learning, free up "class time" for exercises and facilitate interactions across locations. The use of big data for instruction and management has the potential to improve systems and processes. However, technology is not a panacea; privacy and other challenges must be overcome, and technology must be made to benefit disadvantaged groups. Policy makers and institutions should follow and improve the evidence on how to effectively harness ICTs for lifelong learning.
- **Ensure learning opportunities respond to changing skills needs in the economy and society**. Skills needs are changing rapidly in the context of rapid technological change. This applies to high-level social and cognitive skills as well as job-specific skills. Training providers need to be attuned to changing skills needs by seeking employers' input into programme design and by making use of skills assessment and anticipation information (see Chapter 5). They should also provide flexible learning opportunities that allow learners to move easily between programmes as demand changes. Highly specialised technical skills should be developed either within companies or in close collaboration with them to ensure that the skills meet their needs.

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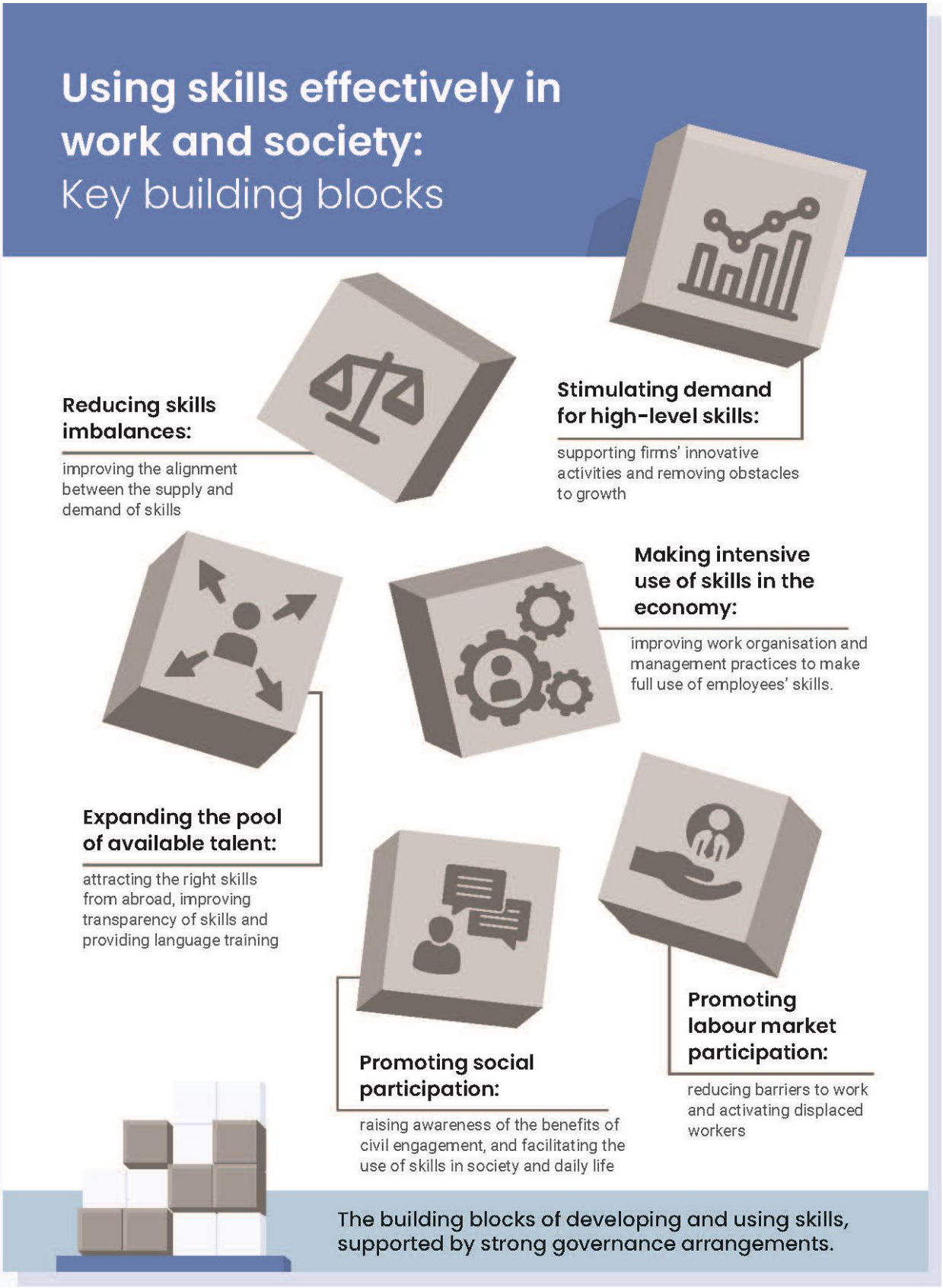
Chapter 5. Using skills effectively in work and society

This chapter presents the portion of the OECD Skills Strategy Dashboard that pertains to using skills effectively, allowing for a comparative assessment of country performance. It explores a series of policy priorities relating to the use of skills, including: 1) promoting labour market participation; 2) promoting social participation; 3) expanding the pool of available talent; 4) making intensive use of skills in the workplace; 5) reducing skills imbalances; and 6) stimulating demand for high-level skills.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.


Using skills effectively in work and society:
Key building blocks
Reducing skills imbalances:
improving the alignment between the supply and demand of skills
Stimulating demand for high-level skills:
supporting firms' innovative activities and removing obstacles to growth
Making intensive use of skills in the economy:
improving work organisation and management practices to make full use of employees' skills.
Expanding the pool of available talent:
attracting the right skills from abroad, improving transparency of skills and providing language training
Promoting social participation:
raising awareness of the benefits of civil engagement, and facilitating the use of skills in society and daily life
Promoting labour market participation:
reducing barriers to work and activating displaced workers
The building blocks of developing and using skills, supported by strong governance arrangements.

Box 5.1. Key policy lessons on using skills effectively in work and society

Promote labour market participation. Developing skills will only have the desired impact on the economy and society if those skills are made available to the labour market. Identify barriers to work and intervene early to promote equal opportunities. Create the right incentives to work by accompanying safety nets with an effective activation strategy. Assist displaced workers by intervening prior to displacement with re-employment measures, including counselling and reskilling that are well-informed by information about skills needs.

Promote social participation. A balanced set of cognitive, social and emotional skills can support adults in achieving positive social outcomes and increased social engagement. Governments can raise awareness about the benefits of using one's skills to participate in civil society. They can also introduce incentives to overcome barriers to using skills in civil society, including time off work or financial incentives for volunteering.

Expanding the pool of available talent. Attract the right skills from abroad, improve transparency of skills and provide language training. Migrants now account for about one in ten people living in OECD Member countries; however, they are more likely to be over-qualified. Highly educated migrants also have lower employment rates than their native-born counterparts. Governments should engage with employers to ensure that foreign qualifications are recognised, and to secure early work experience for migrants. Providing language training reduces a significant barrier to work; ideally, this training should be provided on the job.

Support employers in making better use of employees' skills. Governments can support firms by raising awareness about the benefits of improved organisation and management practices that contribute to better skills use, including teamwork, task discretion, mentoring, job rotation, applying new learning, incentive pay, and flexible working hours. Governments can also disseminate good practice, develop diagnostic tools to help firms identify room for improvement, promote knowledge transfer and offer management skill development programmes. Interventions should be targeted to small- and medium-sized enterprises (SMEs) who face cost constraints in implementing new management and organisation practices.

Reduce skills imbalances. Support reallocation of skills and labour to the occupations, regions and sectors that most need them by reducing barriers associated with internal mobility and make labour markets more flexible. Competency-based occupational frameworks can facilitate better skills matching by making skills more visible.

Stimulate demand for higher-level skills. To avoid economies getting trapped in "low skills equilibria", policies can shape demand for high-level skills. Combine government support for research and development with education and training policies to simultaneously boost demand and supply for skills that complement high-tech production. Fostering collaboration between academic institutions and firms, and removing barriers to entry for firms also encourages demand for higher-level skills.

Introduction

One of the aims of the OECD Skills Strategy was to broaden the discourse on skills to encompass not only the supply of skills but also the demand for skills. The degree to which skills are used in both the economy and society has significant implications for the returns that countries can expect to receive from their investments in skills. Supply-side interventions will only achieve the desired productivity gains if they are accompanied by simultaneous actions to boost the demand for, and effective use of, skills. Indeed, the failure to fully utilise skills could result in a waste of the initial investment in human capital and depreciation and obsolescence of the skills left unused (Guest, 2006[1]). Several countries have developed successful policies and practices to make the most of the available skills supply in order to support the economy, spur innovation and growth, and strengthen social cohesion.

As discussed in Chapter 1, the 2019 OECD Skills Strategy recognises the inter-related nature of activating and using skills. This chapter combines these two concepts and presents key policy messages for using skills effectively in all facets of work and society.

This chapter will first present a set of quantitative indicators that allow for a comparison of how effectively countries make use of their skills supply. It then explores a series of policy priorities, outlining the key challenges faced by countries and their underlying causes, and proposes policies and practices that can address them.

Assessing performance in using skills effectively

Through its experience working with countries on national skills strategy projects, the OECD has identified a set of key indicators to assess the overall performance of countries in developing relevant skills and using skills effectively. These are presented in the OECD Skills Strategy Dashboard. This dashboard allows countries to make a preliminary assessment of the comparative strengths and weaknesses of their skills systems and facilitates analysis of potential trade-offs or synergies in skills policies.

Table 5.1 presents the portion of the Skills Strategy Dashboard pertaining to **using skills effectively**. The indicators included in this dashboard were chosen to reflect a broad definition of "skills use" in the labour market, where participation in the labour market, the use of skills in the workplace, and the alignment between skills supply and skills demand are considered. Given that the use of skills is also important for engaged and active citizenship, the dashboard includes a measure of the use of skills in everyday life as well. The dashboard also includes measures of the extent to which skills are being used evenly across different groups in society (i.e. men and women, age groups).

Table 5.1. OECD Skills Strategy Dashboard: Using skills effectively in work and society

Summary indicators of the main dimension of *Using skills effectively*

Top 20%
Top 20-40%
Around the average
Bottom 20-40%
Bottom 20%

	Australia	Austria	Belgium (Flanders) [1]	Canada	Chile	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Israel	Italy	Japan	Korea	Latvia	Lithuania	Luxembourg	Mexico	Netherlands	New Zealand	Norway	Poland	Portugal	Slovak Republic	Slovenia	Spain	Sweden	Switzerland	Turkey	UK (England) [1]	UK (Northern Ireland) [1]	United States [1]
How well are skills activated in the labour market? (Employment, labour force participation, NEETs [15-29 year-olds], 2016/17)	Top 20%	Top 20-40%	Around the average	Top 20-40%	Bottom 20%	Top 20-40%	Top 20%	Top 20-40%	Around the average	Bottom 20%	Top 20%	Top 20%	Bottom 20%	Around the average	Top 20%	Around the average	Around the average	Bottom 20%	Bottom 20%	Bottom 20%	Around the average	Around the average	Around the average	Bottom 20%	Top 20%	Top 20%	Top 20%	Around the average	Around the average	Around the average	Around the average	Bottom 20%	Top 20%	Top 20%	Bottom 20%	Top 20-40%	Bottom 20%	Around the average
How inclusive is the labour market? (Employment differences gender, education level, 2017)	Top 20-40%	Around the average	Bottom 20%	Top 20-40%	Bottom 20%	Bottom 20%	Top 20%	Top 20%	Top 20-40%	Around the average	Around the average	Around the average	Around the average	Around the average	Top 20%	Around the average	Around the average	Around the average	Bottom 20%	Top 20%	Top 20%	Around the average	Top 20-40%	Bottom 20%	Around the average	Top 20%	Top 20-40%	Bottom 20%	Top 20%	Bottom 20%	Bottom 20%	Around the average	Top 20%	Top 20-40%	Bottom 20%	Top 20-40%	Around the average	Around the average
How well aligned are skills with the labour market? (Labour market imbalances [Skills for Jobs], 2015/17)	Around the average	Top 20-40%	Around the average	Top 20%	Around the average	Top 20-40%	Top 20-40%	Around the average	Around the average	Top 20%	Bottom 20%	Bottom 20%	Around the average	Around the average	Bottom 20%	Around the average	x	Around the average	x	x	Around the average	Bottom 20%	Bottom 20%	Top 20%	Top 20-40%	Around the average	Top 20%	Around the average	Bottom 20%	Bottom 20%	Top 20-40%	Bottom 20%	Around the average	Top 20%	Top 20-40%	Top 20%	x	Top 20%
Do workplaces make intensive use of skills? (Skills use at work, PIAAC, 2012/15)	Top 20%	Around the average	Around the average	Top 20%	Bottom 20%	Top 20-40%	Top 20-40%	Around the average	Top 20%	Around the average	Top 20-40%	Bottom 20%	x	x	Around the average	Around the average	Bottom 20%	Around the average	Around the average	x	x	x	x	Top 20-40%	Top 20%	Top 20-40%	Bottom 20%	x	Around the average	Around the average	Bottom 20%	Top 20-40%	x	Bottom 20%	Top 20%	Around the average	Top 20%
Do people use their skills intensively in daily life? (Skills use at home, PIAAC, 2012/15)	Top 20-40%	Around the average	Around the average	Top 20%	Bottom 20%	Top 20-40%	Top 20%	Top 20-40%	Top 20%	Around the average	Top 20-40%	Bottom 20%	x	x	Around the average	Around the average	Bottom 20%	Bottom 20%	Bottom 20%	x	x	x	x	Around the average	Top 20%	Top 20%	Around the average	x	Around the average	Top 20-40%	Around the average	Top 20-40%	x	Bottom 20%	Around the average	Around the average	Top 20%
Is the use of skills at work improving? (Skills use at work, difference age groups, PIAAC, 2012/15)	Around the average	Top 20%	Top 20-40%	Bottom 20%	Top 20-40%	Top 20%	Bottom 20%	Top 20-40%	Bottom 20%	Top 20%	Around the average	Around the average	x	x	Around the average	Bottom 20%	Top 20%	Around the average	Around the average	x	x	x	x	Bottom 20%	Around the average	Around the average	Top 20%	x	Top 20-40%	Top 20-40%	Top 20-40%	Around the average	x	Top 20%	Around the average	Bottom 20%	Around the average
Are firms designing workplaces to use skills effectively? (High-performance workplace practices, % of jobs, PIAAC, 2012/15)	Top 20-40%	Top 20%	Top 20%	Top 20-40%	Around the average	Around the average	Top 20%	Around the average	Top 20%	Bottom 20%	Around the average	Around the average	x	x	Around the average	Top 20-40%	Bottom 20%	Around the average	Bottom 20%	x	x	x	x	Top 20%	Top 20-40%	Around the average	Around the average	x	Bottom 20%	Around the average	Around the average	Top 20%	x	Bottom 20%	Top 20-40%	Around the average	Top 20-40%
Is skills use stimulated by innovation? (Researchers, 2015; STI patents, international co-authorship, co-invention, 2016)	Bottom 20%	Top 20-40%	Top 20%	Bottom 20%	Bottom 20%	Around the average	Top 20%	Around the average	Top 20-40%	Top 20-40%	Around the average	Bottom 20%	Bottom 20%	Top 20%	Top 20%	Bottom 20%	Bottom 20%	Bottom 20%	Around the average	Bottom 20%	Bottom 20%	Top 20%	Bottom 20%	Top 20-40%	Top 20-40%	Top 20-40%	Bottom 20%	Around the average	Around the average	Bottom 20%	Bottom 20%	Top 20%	Top 20%	Bottom 20%	Top 20-40%	x	Around the average

1: For Belgium (Flanders) and United Kingdom (England and Northern Ireland), a combination of regional (PISA and PIAAC on the level of Flanders, England and Northern Ireland) and national data have been used depending on the source.

Note: The Skills Strategy Dashboard has a focus on outputs of the skills system. A list of relevant indicators has been selected and aggregated and normalised in such a way that a higher value and being among the "Top 20%" reflects better performance. Colours in the dashboard represent the quintile position of the country in the ranking. The "x" indicates insufficient or no available data for the underlying indicators, and dotted circles indicate missing data for at least one underlying indicator. Data was not available for all aggregate indicators for all countries, particularly due to absence in the Survey of Adult Skills (PIAAC). An explanation of the underlying indicators is provided in the Annex A.

Countries with inclusive labour markets tend to see strong overall labour market performance

Almost all the top-performing countries with respect to employment and labour force participation tend to have small differences in performance between men and women and different education levels even when adjusted for relevant characteristics. Good examples are the Scandinavian countries, New Zealand and Switzerland. Still, strong overall labour market performance is not a guarantee for an inclusive labour market. In Japan, for example, employment and labour market participation are high, but there are still comparatively large differences between the employment of men and women. In the Czech Republic and Slovenia, employment levels are above OECD averages, but the low educated are lagging behind. Such countries could see significant potential benefits in encouraging all groups to enter (or re-enter) the workforce (see the section below, "Promoting labour market participation: Reducing barriers to work and activating displaced workers").

More highly skilled countries are more likely to have citizens who use their skills intensively at home and in daily life

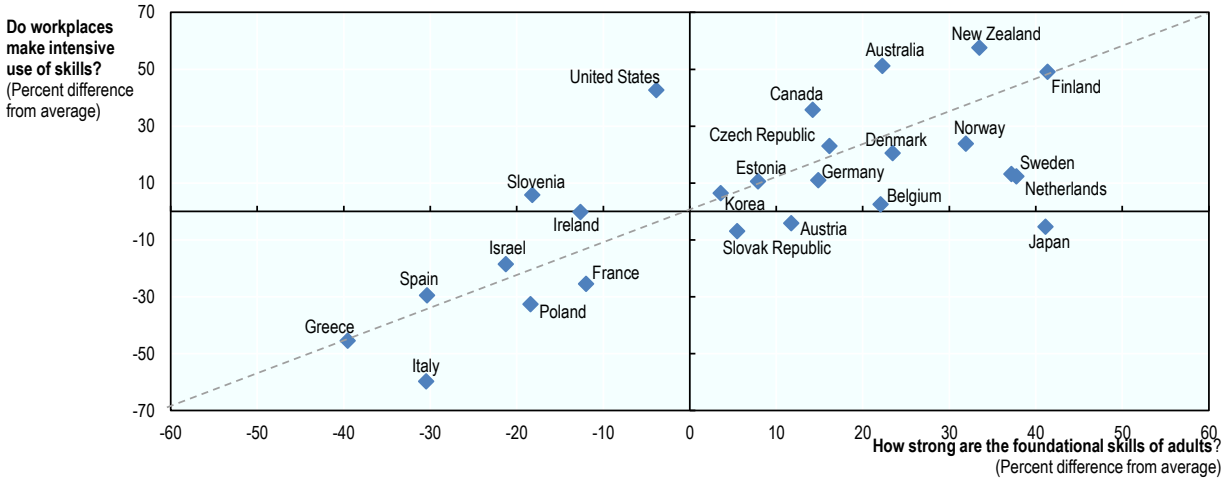
Various countries with highly skilled populations, including Canada, New Zealand and the Scandinavian countries, appear to use adults' skills more intensively outside of the workplace in everyday life than in most OECD Member countries. For instance, such citizens read financial statements, write articles and use information and communication technology (ICT) skills for online services. Conversely, in countries with relatively low levels of skills, for example, Chile, Greece, Italy and Turkey, the use of skills at home is among the lowest in OECD Member countries. However, there are also countries with high skills proficiency that score low in the use of these skills outside of the workplace. In Japan, in particular, the use of literacy and ICT skills outside of work is low despite the high average level of skills. Since skills use outside the workplace is associated with engaged and active citizenship, countries should encourage their citizens to actively apply their skills in daily life (see the section below, "Promoting social participation: Raising awareness of the benefits of civic engagement, and supporting the use of skills in society and daily life").

Not all countries that perform well at developing skills also do a good job of ensuring that these skills are used intensively at work

Many countries combine strong performance in skills proficiency with high levels of skills use in the workplace (Figure 5.1). Some countries use the skills of their population intensively in the workplace despite having relatively low-skilled workforces. The United States is the strongest example here – the US workforce generally performs at average or slightly below average on skills development (both PISA and PIAAC) but is a top performer in terms of using skills in addition to strong overall labour market performance. This demonstrates that despite some deficiencies in skills development, skills can be used intensively, with positive consequences for productivity and earnings (see the section below, "Making intensive use of skills in the workplace: Improving work organisation and management practices to make full use of employees' skills"). Conversely, some countries with highly skilled workforces are not optimally using their skills. One example is Japan, where a highly skilled adult population scores below average in the use of skills and where labour shortages are also large. These countries

could potentially reap large benefits in terms of wages and productivity by making better use of existing skills, and by putting more people to work.

Figure 5.1. Adult skill levels and the use of skills in the workplace



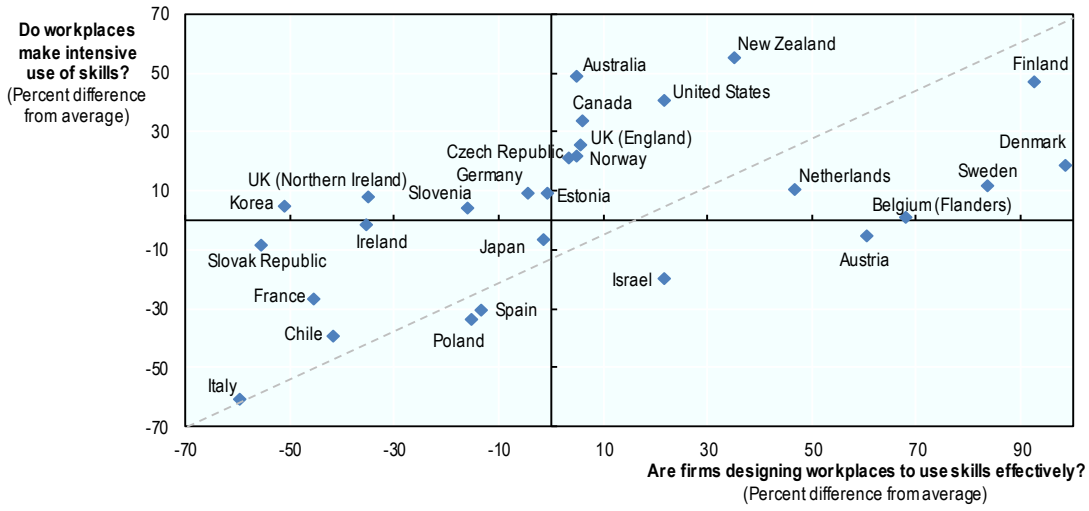
Note: The figure is based on indicators from the OECD Skills Strategy Dashboard, using normalised scores of the following aggregated indicators: "How strong are the foundational skills of adults?" and "Do workplaces make intensive use of skills?" both based on PIAAC scores.
Source: OECD calculations based on (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933928046

The adoption of high-performance work practices can help promote the intensive use of skills at work

Several practices in the workplace are known to have a positive impact on employee performance (Figure 5.2). This includes, for instance, practices related to the flexibility of work, working with colleagues, planning one's own activities, and various management practices. The dashboard shows that countries that perform well in the adoption of these high-performance work practices (HPWPs), also generally have comparatively high levels of skills use in the workplace; this is particularly the case in the Scandinavian countries, Australia, Canada, United Kingdom (England), the Netherlands, New Zealand and the United States. This finding underscores the need to expand the adoption of HPWPs to support the effective use of skills (see the section below, "Making intensive use of skills in the workplace: Improving work organisation and management practices to make full use of employees' skills").

Figure 5.2. High-performance workplace practices and the use of skills in the workplace



Note: The figure is based on indicators from the Skills Strategy Dashboard, using normalised scores of the following aggregated indicators: "Do workplaces make intensive use of skills?" and "Are firms designing workplaces to use skills effectively?", both based on PIAAC scores.
Source: OECD calculations based on (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933928065

Minimising skills imbalances entails not only developing relevant skills but also recruiting new talent with relevant skills and improving the allocation of labour

Skills imbalances refer to misalignment between skills demand and supply in an economy and can comprise skills mismatches as well as skills shortages and surpluses. The presence of skills imbalances can indicate that an economy is dynamic, with jobs and skills needs that are being rapidly transformed. However, all other things being equal, persistent skills imbalances should be minimised as they have a number of negative impacts, including a higher risk of unemployment, lower wages, lower job satisfaction and lower productivity. Still, there is no simple way to reduce imbalances, as evidenced by the lack of a strong relationship between the indicator of skills imbalances and the various indicators of skills development (see Chapter 4) and effective skills use (this chapter). This finding underscores that reducing skills imbalances requires taking a multi-pronged approach, involving, among other things, creating responsive education systems, providing effective career guidance, and supporting continuous skills development over the life course as well as through attracting migrants with relevant skills (see the section below, "Expanding the pool of available talent: Attracting the right skills from abroad, improving the transparency of procedures for skills recognition, and providing language training"), and developing labour market institutions and policies that support labour mobility and flexibility (see the section below, "Reducing skills imbalances: Improving the alignment between the supply and demand of skills").

Policies to promote innovation can strengthen demand for higher levels of skills

The adoption of policies that promote innovation (e.g. research and development [R&D] expenditure, promoting research, securing innovative property such as patents, copyrights, and trademarks, and supporting innovative international co-operation) can also stimulate the demand for higher levels of skills and, by extension, help countries move up the value chain. This finding underscores the importance of aligning policies that impact the supply of skills with those that impact demand for skills to ensure that they are mutually reinforcing (see the section below, "Stimulating demand for high-level skills: Supporting firms' innovative activities, and removing obstacles to growth").

Promoting labour market participation: Reducing barriers to work and activating displaced workers

Developing skills will only have the desired impact on the economy and society if those skills are made available to the labour market. Giving people opportunities to participate in the labour market and making full use of their skills at work improves individual well-being and strengthens economic growth. This section discusses the challenge of attaining labour market participation among all groups in society and reviews good practices for removing barriers to work and for activating those workers displaced by structural changes in the economy.

The challenge: Persistently high long-term unemployment and low activation of some groups

While the unemployment rate has declined to below, or close to, pre-crisis levels in almost all countries, the recession has left its scars with persistently high long-term unemployment in many OECD Member countries. Long periods of unemployment are associated with discouragement and the loss of human capital and skills, making reintegration efforts more difficult.

Furthermore, there are marked differences in labour market participation as well as the incidence of long-term unemployment between regions and population groups within OECD Member countries. High unemployment and weak labour market attachment of some groups reflect a range of barriers to working or moving up the job ladder, and often a combination of barriers for the most disadvantaged groups.

Even in the absence of an economic downturn, ongoing changes in the economy due to digitalisation, globalisation and population ageing have led many workers to lose their jobs and to become "displaced workers" (see Chapter 3 for a more detailed discussion of the consequences of these megatrends). While a portion of displaced workers move quickly into new jobs that match or exceed the quality of the job they lost, others experience a lasting decline in their earnings capacity, due to long-term unemployment, large wage reductions on the post-displacement job or a combination of the two (OECD, 2018[3]). Compared to the average employee, displaced workers tend to use less mathematics, less cognitive, interpersonal and verbal skills in their pre-displacement jobs, and more craft and physical skills, suggesting that they may be ill-equipped to move into expanding sectors that may be more demanding in terms of the level of skills required (Quintini and Venn, 2013[4]). As set out in the new OECD Jobs Strategy (Box 5.2), policies to help workers move from declining businesses, industries and regions to those with higher growth prospects will be essential to deal with the rapid transformation of economies resulting from megatrends. Such policies in support of labour market

dynamism should be accompanied by policies to help displaced workers maintain and upgrade their skills (OECD, 2018[5]).

Box 5.2. OECD Jobs Strategy 2018

In 1994, the OECD Jobs Strategy was released to provide a set of policy guidelines to OECD Member countries to tackle high and persistent unemployment. This was followed by a revised version in 2006 and again in 2018. The 2018 OECD Jobs Strategy provides guidance on policies that enable workers and firms to harness the opportunities provided by new technologies and markets while helping them to cope with the required adjustments and ensuring that the fruits of growth are broadly shared. It continues to emphasise the importance of job quantity for strong and sustained economic growth, but it also recognises job quality in wage and non-wage working conditions and labour market inclusiveness as central policy priorities. Policy recommendations are organised around three principles:

- **Promote an environment in which high-quality jobs can flourish**. Strong labour market performance requires a solid macroeconomic framework, a growth-enhancing environment and skills that evolve in line with market demand. Policies need to strike the right balance between employment flexibility (to ensure that resources are reallocated to their most productive uses) and stability (to foster learning and innovation in the workplace).
- **Prevent labour market exclusion and protect individuals against labour market risks**. Take a preventative approach to labour market inclusiveness by strengthening equality of opportunities, so that socio-economic background does not act as a key determinant of success in the labour market. Tackle barriers to the acquisition of education and skills by individuals from disadvantaged backgrounds through targeted interventions during (pre-) school years and in the transition from school to work. Adapt working conditions to workers' needs over the life course: by making it easier to combine work, care and social responsibilities and preventing the development of work-related health problems, this increases labour force participation over a working life, narrows gender gaps and reduces the risk of poverty and exclusion.
- **Prepare for future opportunities and challenges in a rapidly changing labour market**. Helping workers move from declining businesses, industries and regions to those with the highest growth prospects should be accompanied by policies to help individuals maintain and upgrade their skills, assist lagging regions, strengthen social safety nets, and enhance the role of social dialogue in shaping the future world of work. Link education and training to individuals rather than jobs and make them more accessible, to accommodate the fact that increased fragmentation of production processes and the likelihood that workers will move between jobs more frequently may reduce incentives for firms and workers to invest in firm-specific skills. Ensure that workers remain protected against labour market risks in a world where flexible forms of work may increase by guaranteeing that everybody has access to social protection and is covered by basic labour market regulations.

Source: OECD (2018[5]), *Good Jobs for All in a Changing World of Work: The OECD Jobs Strategy*, https://doi.org/10.1787/9789264308817-en.

Good practices

Addressing barriers to work

Expanding the supply of skills in the longer term requires making labour markets more inclusive through increasing the labour market participation of groups that are currently at the margins of the labour market. These groups – notably youth, older workers (especially those with low qualifications), people with caring responsibilities (mostly mothers with children), people with disabilities and immigrants and refugees – typically face multiple barriers to access full employment and good quality jobs and to make use of their skills in the labour market. Relative to prime-aged men, employment rates are generally lower for these groups (Figure 5.3). Common barriers to work include lack of adequate education, skills and/or work experience, health problems, care responsibilities and childcare costs, lack of transportation, social problems and insufficient financial incentives to take up work.

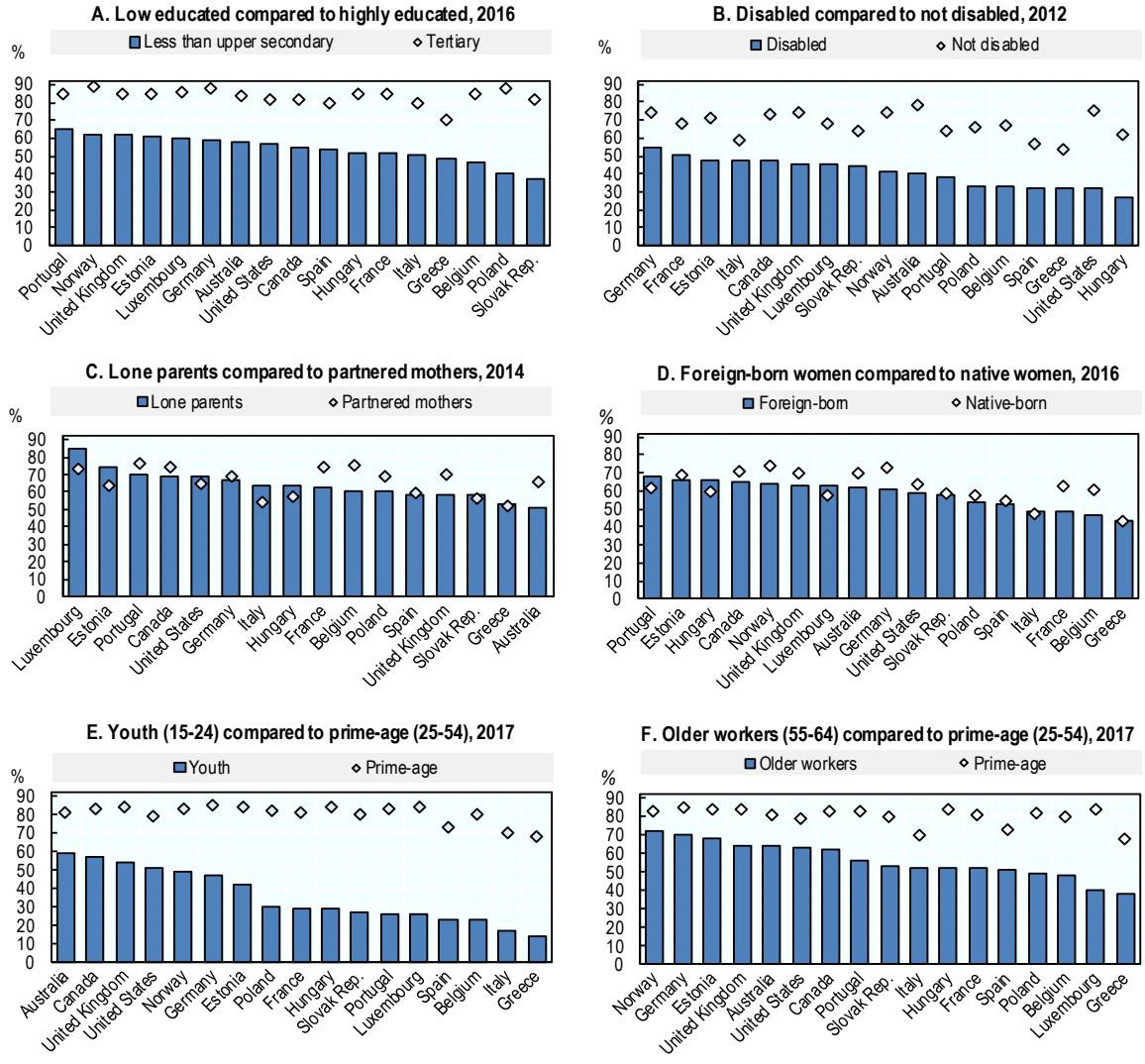
As mentioned, the new OECD Jobs Strategy advocates strengthening equality of opportunities so that socio-economic background does not act as a key determinant of success in the labour market. This requires tackling barriers to the acquisition of education and labour market skills by individuals from disadvantaged backgrounds through targeted interventions during pre-school years (i.e. participation in pre-school education), school years (i.e. preventing early school leaving), in the transition from school to work and second-chance educational programmes for early school leavers who are unable or unwilling to return to a standard school (OECD, 2018[5]). Interventions are most effective when there is co-ordination across the range of programmes and services at the regional and local levels, involving employment services, vocational education and training providers and economic development agencies (OECD, 2016[6]).

Improving labour market inclusiveness also requires a life-course perspective, to avoid an accumulation of individual disadvantages that require costly interventions at a later stage. To reduce the risk of workers becoming trapped in low-quality jobs or joblessness, they should have ongoing opportunities to develop, maintain and upgrade skills through learning and training at all ages, as explored in Chapter 4. Similarly, working conditions should be adapted to workers' needs over the life course; for instance, by making it easier to combine work, care and social responsibilities, and by preventing the development of work-related health problems. This not only increases labour force participation over a working life but also narrows gender gaps and reduces the risk of poverty and exclusion (OECD, 2018[5]).

When workers lose their jobs, safety nets like unemployment insurance can help them to avoid poverty and deprivation, which act as barriers to future employment. However, current social security systems are still largely based on the notion of an employer-employee relationship, and in over half of G20 countries with available data, the self-employed have no access to unemployment benefits (OECD, 2017[7]). Adapting social security systems to the new world of work may require a fundamental paradigm shift, where entitlements are linked to individuals rather than jobs and are portable from one job to the next. In the United States, social security accounts are already "multi-employer."

Figure 5.3. Some groups are significantly under-represented in employment

Employment-to-population ratio, selected OECD Member countries



Note: Data refer to persons aged 25 to 64 in Panel A; data refer to persons aged 15 to 64 in Panels B, C and D.

Source: Panel A: OECD dataset: *Educational attainment and labour-force status*, http://stats.oecd.org/Index.aspx?DataSetCode=EAG_NEAC. Panel B: *EU-SILC 2012* except: 1) Australia: *Survey of Disability and Carers 2012*, Australian Bureau of Statistics, 4430.0 - *Disability, Ageing and Carers*, *Australia: Summary of Findings, 2012*; 2) Canada: *Canadian Survey on Disability*, 2012, Statistics Canada. Table 115-0005 - Labour force status for adults with and without disabilities, by sex and age group, Canada, provinces and territories; 3) Norway: LFS 2012 Q2, http://www.ssb.no/en/arbeid-og-lonn/statistikker/akutu; 4) United Kingdom: LFS 2012; 5) United States: *Survey of Income and Program Participation*, SIPP 2008 Panel, wave 13, September 2012 to December 2012, http://www.census.gov/programs-surveys/sipp/data/2008-panel.html. Panel C: *OECD Family Database*, www.oecd.org/social/family/database.htm. Panel D: OECD dataset: *NUP rates by place of birth and sex*, http://stats.oecd.org/Index.aspx?DataSetCode=MIG_NUP_RATES_GENDER. Panels E and F: OECD dataset: *LFS by sex and age - indicators*, http://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R.

StatLink https://doi.org/10.1787/888933928084

Safety nets should also be accompanied by an effective activation strategy, which combines measures to ensure that jobless people have the motivation to search actively and accept suitable jobs (e.g. through appropriate tax and benefit incentives), with actions to match job seekers with suitable opportunities (e.g. job search assistance, direct referrals, subsidised employment) and interventions to increase the employability of the least employable (e.g. training and work-experience programmes; OECD (2015[8])).

Public employment services are increasingly putting emphasis on matching job seekers to jobs on the basis of skills, rather than qualifications or work experience. Qualifications and job experience are not a perfect indication of the skills a worker possesses (Quintini, 2011[9]; OECD, 2013[10]), and skills-based approaches to matching may be both more inclusive and more effective. They are more inclusive because they open opportunities to workers who have acquired relevant skills through informal training on the job but lack a formal qualification. They may also be more effective since employers can specify the particular skills they require, rather than being constrained by poor approximations of these skills, like qualifications or job experience. In Flanders (Belgium), the public employment services use the "Competent" database to match job seekers with jobs on the basis of skills (Box 5.3).

Box 5.3. Country practices: A skills-based approach to job matching

In **Belgium** (Flanders), the "Competent" database is used by the Flemish public employment service (VDAB) to match job seekers with vacancies based on skills requirements, rather than by the traditional qualification and work experience requirements. With the current digital matching tool, employers may enter vacancy information, including location, qualification requirements, as well as skills requirements. At the same time, job seekers who subscribe to VDAB complete an online profile, selecting the skills that they possess. Jobseekers and employers receive a list of vacancies/jobseekers which correspond to a least 80% of their profile/vacancy requirements. The Competent database is updated frequently to ensure that it is responsive to changing skills needs in the labour market.

The VDAB will soon launch a new version of the digital matching tool (Projectfiche Constructiv), which is intended to make it even more user-friendly. Using text analytics, the tool is trained to "read" uploaded job vacancies and CVs, to recognise patterns and to extract relevant information. Doing so produces a list of qualifications and work experience, which the tool then translates into skills requirements using the Competent database. In this way, the new tool will simplify the process of inputting skills possessed or skills required for job seekers and employers, respectively.

Source: OECD (2019[11]), *OECD Skills Strategy Flanders: Assessment and Recommendations*, https://doi.org/10.1787/9789264309791-en.

Activating displaced workers

A crucial difference between displaced workers (i.e. individuals who lose their jobs for economic reasons) and most other groups is that it is often possible to initiate re-employment services during the notice period prior to displacement (e.g. setting up a temporary employment office in a factory that will soon close). These early intervention services appear to be quite effective. In Australia, early support to employees affected by the closure of Australia's car manufacturing industry meant that by the time the last plant

closed in 2017, 84% of former employees had reportedly found new employment or entered retirement (Box 5.4).

However, early intervention services are not used as widely as would be desirable, often being limited to workers affected by mass layoffs. Some countries make services available to regions or sectors affected by structural change. In the Netherlands, following OECD recommendations (2017[12]), the country made changes to its use of sectoral training funds to promote reallocation of labour from declining to expanding sectors. (Box 5.4) provides additional examples of countries that make early intervention services available to all displaced workers, including those in smaller firms.

Box 5.4. Country practices: Activating displaced workers

The Skills and Training Initiative in **Australia** is part of the Growth Fund, which is an AUD 155 million fund to support businesses and regions affected by the closure of Australia's car manufacturing industry. It is co-financed by government and industry. Taking advantage of long lead times in advance of factory closures, onsite transition centres provided employees with informed career guidance, recognition of prior learning, and retraining based on occupations and sectors in demand. These services were also made available to workers in the supply chain. Furthermore, the factory invited possible new employers to visit the factory to see the type of work that employees were doing in order to facilitate their re-employment. Survey evidence found that 84% of former factory employees had found new employment or entered retirement at the time of plant closure.

Based on collective agreements between social partners in a sector or occupation, job security councils (JSCs) in **Sweden** are actively involved in the process of restructuring and provide advice and consultation to employers and trade unions at an early stage, while also providing transition services (individual counselling, career planning and job-search assistance) to redundant workers. JSC activities are financed by employer contributions (typically 0.3% of the payroll). JSCs distribute the risk and costs of restructuring among its members while allowing access for workers in small- and medium-sized enterprises. Around 80% of JSC participants find a solution (either employment or retraining) within a period of seven months. This high share was sustained even during the crisis of 2008-10.

In **Denmark**, regardless of the size of a firm, warning pool funds can be used to establish a temporary employment service in a workplace, where caseworkers from the local job centre deliver job-search assistance and help workers build an individual job strategy. Counselling services are provided during the notice period, preparing workers for their displacement. Supplementary warning pool funding can be granted to support retrenched workers after their notice period through counselling and career clarification courses (up to two weeks), work-study programmes (internships and education) or language courses (up to eight months). Support for skills-upgrading is granted either for skills in current or future demand (as determined by the regional labour market authority). Skills-upgrading must be planned within 14 days after displacement, begin no later than 3 months after displacement and end at least 6 months after displacement.

Source: OECD (2018[13]), *Getting Skills Right: Australia*, https://doi.org/10.1787/9789264303539-en; OECD (2015[14]), *Back to Work: Sweden: Improving the Re-employment Prospects of Displaced Workers*, https://doi.org/10.1787/9789264246812-en; OECD (2016[15]), *Back to Work: Denmark: Improving the Re-employment Prospects of Displaced Workers*, Back to Work, https://doi.org/10.1787/9789264267503-en; OECD (2017[16]), *OECD Skills Strategy Diagnostic Report: The Netherlands 2017*, https://doi.org/10.1787/9789264287655-en.

The success of early intervention services depends on having a long notice period prior to displacement. Active engagement with social partners combined with the development and use of skills anticipation exercises, like forecasting and foresight exercises (discussed in Chapter 4), can assist in providing early warning of declining demand by occupation, sector or region.

Policy recommendations for promoting labour market participation

In light of the findings and practices above, the following policy recommendations can help countries promote labour market participation (Box 5.5).

Box 5.5. Policy recommendations: Promoting labour market participation

- **Intervene early to prevent barriers to work.** Promote equal opportunities to avoid socio-economic background from determining labour market outcomes through its influence on the acquisition of relevant labour market skills or as a source of discrimination. Workers should have ongoing opportunities to develop, maintain and upgrade skills through learning and training at all ages, to prevent individual disadvantages from accumulating over time.
- **Create the right incentives to work.** Provide adequate safety nets accompanied by an effective activation strategy that combines measures to ensure that jobless people have the motivation to search actively and accept suitable jobs, with actions to match job seekers with suitable job opportunities, and interventions to increase the employability of the least employable through training. Efforts to match job seekers with suitable job opportunities should consider the use of skills-based matching tools.
- **Assist workers in transition prior to their displacement**. The reallocation of displaced workers between firms, industries and regions should be supported by early intervention and re-employment measures, including counselling and reskilling. Since successful intervention depends on long lead times, active engagement with social partners and the development and use of skills anticipation exercises are needed.

Promoting social participation: Raising awareness of the benefits of civic engagement, and supporting the use of skills in society and daily life

Not only do the previously mentioned global trends affect the economy and labour markets, but they also underpin societal developments. For example, the rise of digital platforms has had a polarising influence on the media we consume, so that increasingly we connect with those who have similar interests, backgrounds and perspectives. The rise of new flexible forms of work, the ongoing automation of certain tasks and jobs, and demographic shifts may also be contributing to widening social inequalities, with diverging opportunities for young versus old, high versus low-skilled workers, and adults in, versus out, of the labour market.

These developments have implications for social cohesion, and throughout OECD Member countries, there are indications that social cohesion is under pressure. For instance, many countries are experiencing an erosion of trust in government, a decrease in social support (measured as the share of people who report having a friend or relative

whom they can count on in times of trouble), and a drop in voter turnout in the last decade (OECD, 2017[17]).

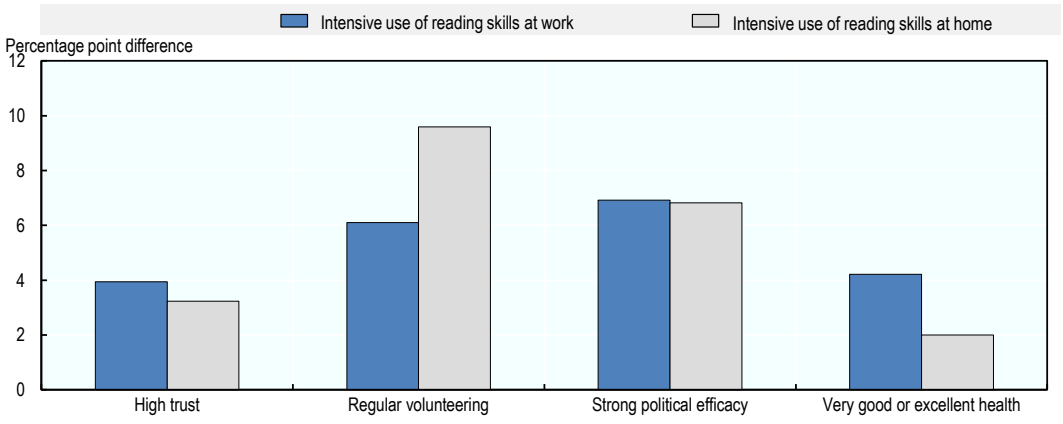
Skills can play a crucial role in improving social cohesion. For instance, a balanced set of cognitive, social and emotional skills can support adults in achieving more positive social outcomes. To realise the full social potential of skills investments, skills should be used actively in both daily life and civil society.

The challenge: Supporting the use of skills in daily life and civil society

There is substantial evidence concerning the positive effect of education and skills on social outcomes (OECD, 2015[18]; OECD, 2016[19]), and these outcomes are enhanced when citizens actively contribute their skills at home, at work and in the community. Figure 5.4 shows that over and above the effect of having literacy skills, the actual use of literacy skills in everyday life – for example by reading books and news and writing articles and reports – is associated with higher social trust, greater volunteerism, stronger political efficacy and better health. Moreover, positive social outcomes reinforce each other. For example, the likelihood of trusting other people increases by 5 percentage points when one is active in volunteer work [calculations based on the Survey of Adult Skills (PIAAC) (OECD, 2018[2])].

Figure 5.4. The effect of the use of skills on positive social outcomes

Percentage point increase in the likelihood of positive outcomes when reading skills are used intensively at work and home, beyond the effect of literacy proficiency



Note: Regression controlling for literacy proficiency, educational attainment, gender, parental educational attainment and age. Only adults aged 25-64 were included in regression, and employed for regressions on the use of reading skills at work. For the social indicators, the following definitions have been used: high trust is reflected in (strongly) disagreeing with the statement of trusting only a few people, regular volunteerism is defined as participating in volunteer work at least once per month, and political efficacy is reflected in (strongly) disagreeing with the statement of feeling of no influence.
Source: OECD calculations based on OECD (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933928103

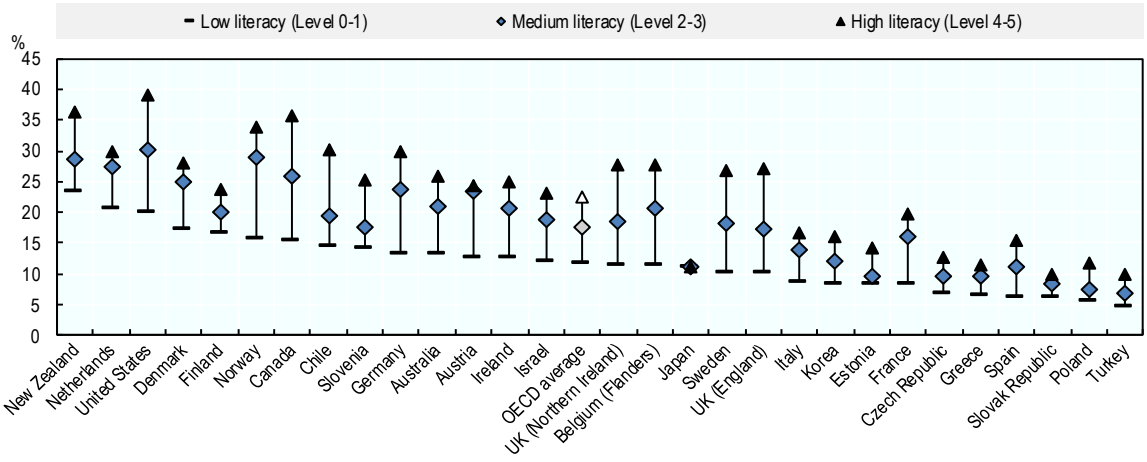
Other studies provide additional evidence on how the use of social skills at work and in daily life affect social views and behaviour. Working in a team and sharing information with colleagues, for example, is associated with more favourable views of society, including enhanced trust in others (Borgonovi and Burns, 2015[20]). Furthermore, the use

of skills can indirectly have a positive effect on society through its effect on the skills development of other individuals, especially children. When parents read books and tell stories to children, it raises the likelihood that the child will develop stronger skills with related social outcomes (OECD, 2012[21]).

Beyond the positive externalities of applying skills in everyday life, building an actively engaged society also depends on the extent to which skills are effectively applied in civil society, community and associational life. Social participation can occur in various forms, including the participation in formal and informal organisations such as religious groups, sport and recreational groups, and political parties. Data show that there is significant diversity across countries in terms of the level of social participation, the type of organisations that people participate in, and the intensity of participation (passive or active membership) (OECD, 2015[22]).

A concrete example of social participation is involvement in volunteer activities. Across OECD Member countries, only a relatively small share of adults report regularly participating in volunteer work. Furthermore, participation depends heavily on individual characteristics, with the unemployed and low-skilled demonstrating especially low participation. On average, 14% of the unemployed are involved in volunteer work, compared with 17% of the employed and 22% of retirees [calculations based PIAAC (OECD, 2018[2])]. While adults with high levels of literacy proficiency are most likely to volunteer regularly, there is no OECD Member country where more than 40% of its highly skilled adults regularly participate in volunteer activities (Figure 5.5). This means that there is considerable room to more fully utilise skills to the benefit of society.

Figure 5.5. Participation in volunteer work at least once per month, by literacy level



Source: OECD calculations based on OECD (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933928122

How people use their skills outside of work may matter more for social cohesion in the context of global trends. Not only are demographic trends leading to a larger share of the population outside the labour force (i.e. more retirees), but automation and more flexible forms of work may also contribute to a larger share of adults spending more time outside of work. Policies that encourage participation in civil society, community organisations and associations can help maximise the social returns on investments in skills.

Good practices

Raising awareness about the benefits of using skills outside of work in daily life and civil society

To improve social and civic engagement, governments can introduce promotional campaigns and provide information about the benefits of social participation. While there is a need to raise civic engagement across all groups, these initiatives should target the groups that show the weakest performance in measures of social and civic engagement, e.g. the unemployed and low-skilled. In addition, as demonstrated by PIAAC data, the use of skills in daily life contributes to better social outcomes. Therefore, reading books and news, and writing articles and reports should be promoted; campaigns could potentially play a role in stimulating these activities (see Box 5.6 for examples).

It is important to build awareness of the benefits of skills use in life and society at a young age since early learning helps to develop stronger outcomes in the future (OECD, 2015[18]). For instance, adults should be made aware of the importance of reading to their children to support their development, and in schools, a culture of engagement can be promoted through community involvement, as well as organising debates on political or social issues. The importance of early learning is discussed in more depth in Chapter 4.

Facilitating and incentivising the use of skills in society

Governments can also facilitate the use of skills in society through policies that help adults to overcome barriers. For many adults, work, family and/or social obligations are a barrier to more active use of their skills in civic life. Implementing labour market policies that give employees more flexibility, such as time off for volunteering, can help overcome these barriers (Do-it Trust, 2016[23]). For example, in England and Wales (United Kingdom), any public sector worker and employees working in a company with at least 250 employees are entitled to 3 days of paid volunteering leave per year (Heywood, 2015[24]).

Financial incentives can also be used to support greater social and civic participation, including subsidies or tax deductions of costs or time related to social participation (e.g. cost of membership of organisations, or tax deductions for donations defined as "public purpose", as is practiced in the United States), or by providing additional benefits to individuals currently outside the labour market who participate in such activities (e.g. a supplement to social assistance payments for jobseekers engaging in volunteer activities with not-for-profit or charitable organisations). Another way for governments to support social participation is to centralise information about volunteer work opportunities (see Box 5.6 for an example).

Box 5.6. Country practices: Promoting social participation

Organised by the **European Union**, EUread is an initiative that brings together organisations that promote reading. Founded in 2000, EUread promotes the exchange of knowledge, experiences and concepts across organisations, and aims to jointly develop strategies for the promotion of reading. Its intention is to raise awareness that a strong structural framework for the promotion of reading on a national and European level should be developed. Members include institutions from Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Italy, the Netherlands, Norway, Poland, Portugal, Switzerland and the United Kingdom. The group's work includes organising campaigns, contests and other events and offering awards and prizes.

In the **Netherlands**, an online database of citizen initiatives (*bewonersinitatieven*), named MAEX, provides information about volunteer initiatives and social enterprises. While part of a foundation, it is supported by municipal governments. All local initiatives are published on this website. Each of these initiatives has a profile describing what they do, what value they deliver for their target group, and who can get involved. In addition, MAEX facilitates transactions between initiatives on the one hand, and funds, volunteer organisations, companies, governments and knowledge institutions on the other hand. For example, money can be donated via MAEX or people can connect to initiatives, creating an efficient method for companies and individuals to invest in an initiative.

In **Canada**, to incentivise volunteering, the Canada Revenue Agency introduced tax credits for volunteering, where individuals can claim the time spent on volunteering work against taxes owed. For instance, when providing volunteer work for emergency services, such as firefighting, a CAD 1 000 tax exemption is applied. There are some conditions, however, including that the individual may not normally work in the same public authority or with comparable duties.

Source: EURead (2019[25]), "About us", https://www.euread.com/about-us/; MAEX (n.d.[26]), "Homepage", https://maex.nl/; Government of Canada (2018[27]), "Emergency service volunteers", https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/payroll/payroll-deductions-contributions/special-situations/emergency-volunteers.html.

In schools, a culture of civic engagement can be promoted through mandatory community involvement, as well as by organising debates on political or social issues. Under mandatory service learning programmes, active participation in volunteer activities is part of curricula. There is evidence that service learning programmes can lead to higher probabilities of volunteering in adulthood, enhanced political activity and more positive views of societal participation (Griffith, 2010[28]; Astin et al., 2006[29]).

Positive attitudes towards the political system and overall belief in one's ability to influence political decisions can be enhanced by taking part in the democratic process. Low voter turnout and a general lack of interest in politics are prevalent in many OECD Member countries (OECD, 2015[30]). Policies that reduce barriers to voting, and those that encourage political participation, for example by promoting online campaigns and public debates, can incentivise adults to use their skills in civil society.

Policy recommendations for promoting social participation

In light of the findings and practices above, the following policy recommendations can help countries promote social participation (Box 5.7).

Box 5.7. Policy recommendations: Promoting social participation

- **Promote the use of skills outside of work**. Given the positive social benefits of using skills outside of work, governments can introduce measures to stimulate and promote this behaviour (e.g. campaigns to promote reading).
- **Raise awareness about the benefits of civic engagement**. Build an awareness of the benefits of active and engaged citizenship from a young age. The government can introduce promotional campaigns, centralise information about volunteer opportunities, and provide information about the benefits of using one's skills in civic and social life (e.g. through volunteering, donating and investing in the community).
- **Promote service learning in schools**. Making volunteering activities an obligatory part of school curricula could encourage young people to apply their skills to everyday life, starting from an early age.
- **Reduce barriers and incentivise adults to use skills in civil society**. Policies and practices can be introduced to overcome barriers, including giving employees more flexibility, such as time off work for volunteering. Financial incentives could be targeted at individuals who are not currently working, as they face tighter income constraints and participation in such activities could help avoid their skills from atrophying.

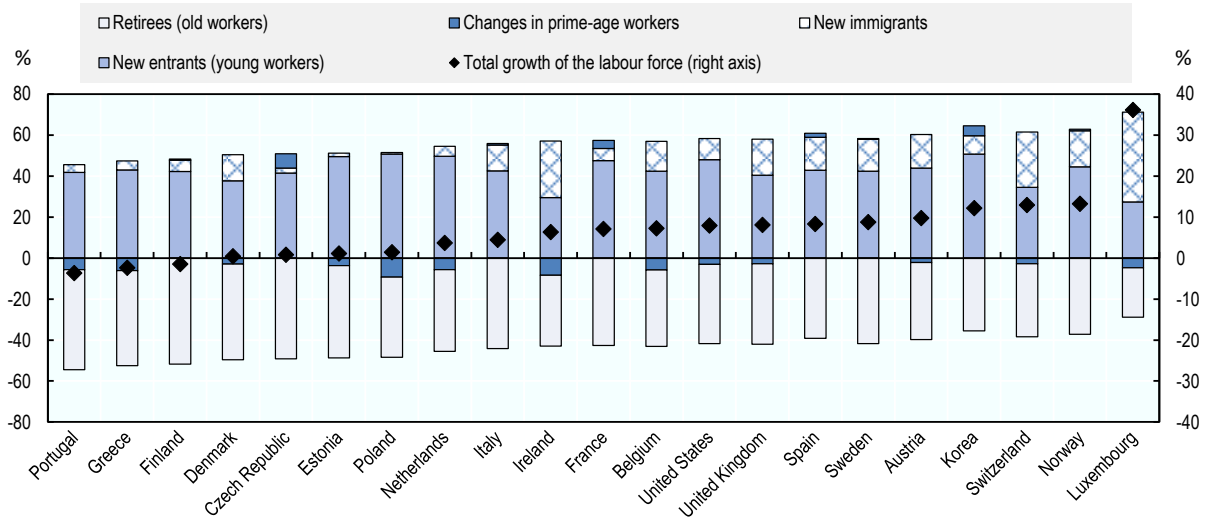
Expanding the pool of available talent: Attracting the right skills from abroad, improving the transparency of procedures for skills recognition, and providing language training

Making the most of migrants' skills is another important consideration in promoting skills use, as migrants now account for about one in ten people living in OECD Member countries (OECD/EU, 2018[31]). In some OECD Member countries, the migrant population is even larger (Canada, Israel, Luxembourg, New Zealand and Switzerland), with migrants accounting for one in five people or less (OECD, 2019[32]). The share of foreigners in total employment has risen sharply in most OECD Member countries over the past decade. During that time, many countries saw new immigrants comprise between one-quarter and one-half of new entries to the labour force (Figure 5.6). OECD Member countries have seen record inflows of asylum seekers and refugees in recent years, with the refugee population in OECD Member countries tripling between 2013 and 2017 (OECD, 2019[33]) Labour migration — migration for the purposes of employment — is a common feature of all OECD economies. It is a relatively small channel, comprising no more than one-third of all permanent migration in any OECD Member country and between 10% and 13% overall (OECD, 2018[34]). Temporary migrants allow countries to meet labour demands at different skill levels through rapid recourse to workers from abroad. In 2016, there were about 2.6 million temporary foreign workers admitted to OECD Member countries, excluding posted workers within the European Union.

In view of their importance to the skills supply in OECD Member countries, this section looks at how best to attract skilled migrants and to make optimal use of their skills.

Figure 5.6. New immigrants account for a large part of the increase in the labour force in selected OECD member countries in the past decade

Components of labour force growth 2005-15



Source: OECD (2019[35]), *Recruiting Immigrant Workers: Korea*, https://doi.org/10.1787/9789264307872-en.

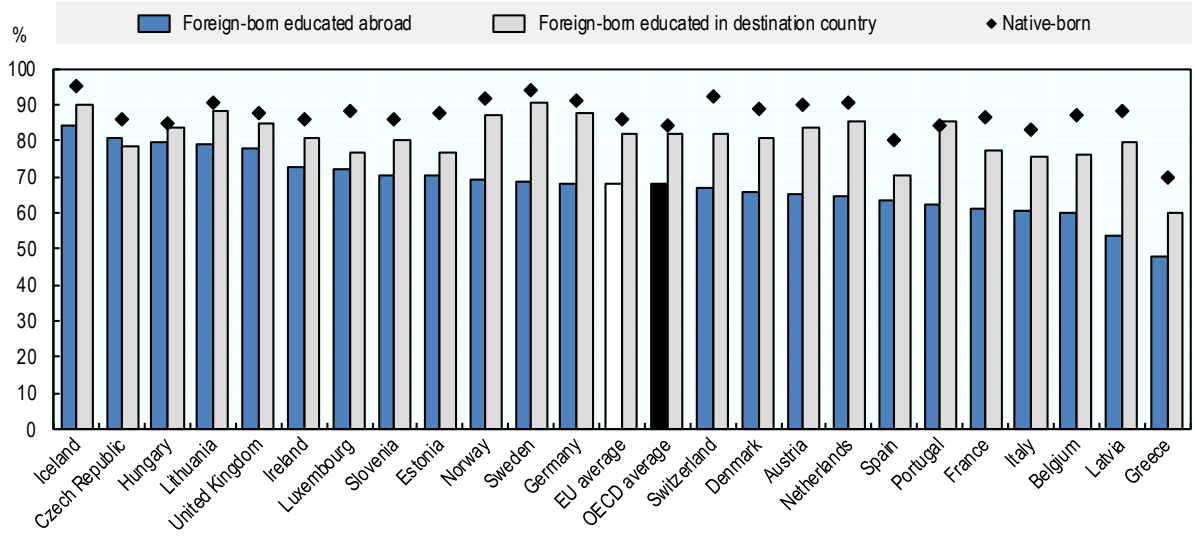
StatLink https://doi.org/10.1787/888933928141

The challenge: Attracting relevant skills from abroad and making full use of them in the labour market

Attracting migrants with relevant skills is an important element of equipping countries to respond to the challenges associated with population ageing, skills mismatches and building a knowledge-based society. A key challenge facing OECD Member countries is how to make full use of migrants' skills despite obstacles including language barriers and poor recognition of foreign credentials.

On average, low-educated immigrants and their native-born peers have comparable employment rates. In contrast, in virtually all OECD Member countries, employment rates of highly educated immigrants are lower than those of their native-born counterparts. And even when such immigrants are employed, they have an almost 50% higher chance of being over-qualified for their jobs than their native-born peers. These obstacles are particularly pronounced for those with qualifications from abroad (Figure 5.7).

Figure 5.7. Employment rate of highly educated foreign- and native-born populations, excluding those still in education, aged 15-64, by place of diploma, 2015/16



Source: OECD/EU (2018[31]), *Settling In 2018: Indicators of Immigrant Integration*, https://doi.org/10.1787/9789264307216-en.

StatLink https://doi.org/10.1787/888933928160

OECD Member countries are thus failing to fully exploit the potential that skilled immigrants offer, and qualifications and work experience from abroad, particularly from non-OECD Member countries, are widely undervalued. One reason is that immigrants often acquire their work experience in different languages and labour markets. Similarly, their qualifications may come from education systems that may perform – or are perceived by employers as performing – less effectively than those of the host countries, and indeed qualifications obtained abroad are associated with lower skills as measured by skills tests (OECD, 2007[36]; OECD, 2014[37]; Bonfanti and Xenogiani, 2014[38]; Sharaf, 2013[39]; Li and Sweetman, 2013[40]).

But even among young people from immigrant families who have been raised and educated in the host country, it is clear that they too face barriers to integration in OECD Member countries. This is especially the case in Europe (OECD, 2010[41]), and particularly for those whose parents are low-educated (OECD, 2017[42]; OECD, 2018[43]). Several other factors are thus at work, including low levels of contact with potential employers, limited access to the networks through which many vacancies are filled, and lack of knowledge of how the labour market functions, especially for higher-skilled positions (OECD, 2007[44]; OECD, 2008[45]). Mentorship programmes can help tackle such obstacles and have met with some success. But discrimination is also a factor: evidence shows that candidates with foreign-sounding names often have to submit twice as many job applications as people with otherwise similar qualifications and experience but with a name that sounds "native" (OECD, 2013[46]).

Good practices

Attracting the right skills from abroad

For many countries, migration complements the domestic skills supply and can be a useful lever in rectifying skills mismatches and addressing skills shortages. With that in mind, various policy measures can support the attraction and retention of migrants with skills relevant to the domestic labour market.

For some countries, attracting sufficient candidates is a challenge, requiring promotion and outreach abroad. The past few years have seen a proliferation of information websites advertising employment possibilities for skilled foreign candidates, such as "Make it in Germany" or "Work in Sweden". Some of these websites allow users to easily check their eligibility for visa programmes, such as Austria's points-calculator for qualified foreign professionals. As at times employers are reluctant to recruit internationally even when shortages in firms are acute (OECD, 2013[47]), a number of countries work with employers to explain how to integrate foreign workers into workplaces where they have not traditionally been employed. For instance, Japan conducts periodic information and training sessions for firms, often linked to job fairs for foreign talent, through its Employment Service Centres for Foreigners (OECD/ADBI/ILO, 2015[48]).

Beyond outreach, a second way to attract foreign talent is to offer favourable permit conditions, including the right to bring family members, the right for family members to work, rapid acquisition of permanent residence and, possibly, citizenship. The past decade has seen competition among OECD Member countries to offer favourable terms to the highest qualified foreign workers. A points-based system for issuing permits with favourable conditions was introduced in Korea in 2010, Austria in 2011 and Japan in 2012. But there is a limit to how far favourable policy can boost the attractiveness of countries for the highest qualified mobile workers; other factors, such as business environment, income and opportunities, and settlement prospects play a more important role (OECD, 2014[49]).

Some countries take an active role in training international migrants under skills mobility partnerships (SMPs). The hope is that some of those who undertake training remain rather than migrate, and those who stay have higher employability and productivity. For example, under recent pilot programmes, official development assistance (ODA) is used to fund training in the origin country with an option for future employment in the destination country. This modernisation of traditional guest-worker programmes has been used in partnerships between Spain and Morocco, for example, as well as in Italy and Moldova. Similarly, under nurse recruitment programmes in Finland, Norway, Germany, and Italy, the destination country works with origin-country partner institutions or recruiters to train to specific requirements. International study is one of the most common forms of SMP, with more than 3 million international students in OECD Member countries. Retention rates in destination countries are typically in the range of 30-35%, which means that many students move on to other countries or return to their country of birth. Those who remain can provide an important source of skills; in France, they account for a large share of first work permits (OECD, 2017[50]). In countries where the vocational education and training (VET) system is well developed, investing in VET training in the destination country can be an attractive option for employers since it provides a guarantee regarding the quality of education as well as the opportunity to develop language skills in a working environment. For instance, Germany has done this in "MobiPro" in the context of intra-EU mobility.

In attractive countries where the pool of interested and qualified candidates is not a problem, or for occupations where an abundance of skilled workers are available globally, the challenge is rather to limit, filter or select those authorised to enter. Countries have a number of tools to secure skills while protecting domestic employment (OECD, 2014[51]). Methods include identifying occupations and sectors where international recruitment is authorised (shortage lists, as in Spain) or forbidden (non-eligible lists, as in Ireland). An alternative is to labour-market test each request to ensure that the skills cannot be found locally. Labour market tests are used in most OECD Member countries when an employer requests a foreign worker; usually, employers must post the vacancy for a fixed period. Some labour market tests, such as in Canada, require employers to detail the methods used to recruit and the reason why staff could not be trained. Other countries are satisfied when the job meets certain wage criteria (as in some programmes in the United States). Shortage lists sometimes exempt employers from these requirements, as in Latvia. In Sweden, employers may recruit for any job, as long as they offer a salary in line with collective bargaining agreements (OECD, 2011[52]).

Setting caps on numbers is a blunt method to limit entry of migrants and is usually based on quantitative indicators balanced against reviews and stakeholders' views. When available slots are over-subscribed, countries have to decide how to attribute permits, whether via random methods or ranking by points-based systems. Here, too, skills shortage lists can contribute to prioritising certain applicants, as in the United Kingdom. A two-step selection, called "expression of interest," was pioneered in New Zealand and is now used in Australia and Canada to manage and select permanent economic migrants (Box 5.8). It is also used in Korea to select the most adaptable candidates in a programme aimed at low-skilled workers (OECD, 2019[35]).

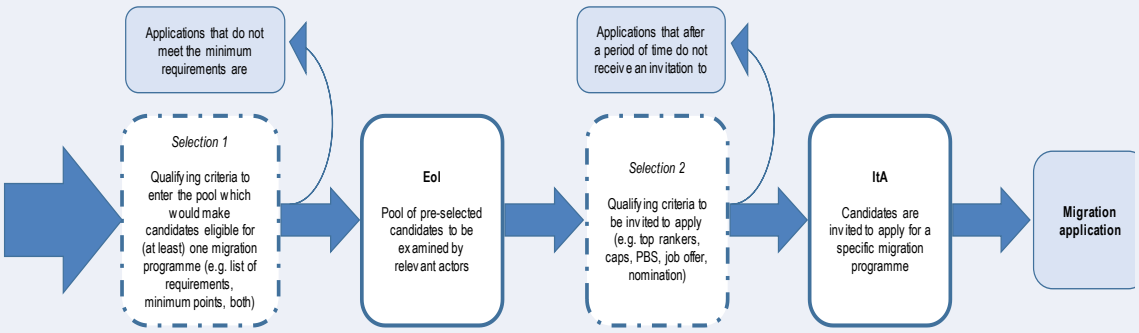
Box 5.8. Country practices: Expression of interest system

New Zealand pioneered the first expression of interest (EoI) system in 2003, in the context of a wider review of its supply-driven permanent migration system. The introduction of the two-step EoI process moved New Zealand from a policy of "passive acceptance of residence applications" to a more "active selection of skilled migrants" (Merwood, 2008[53]).

An EoI system is a two-step application process: 1) selection for the pool; and 2) selection to apply (Figure 5.8). Potential migrants express an interest in migrating to New Zealand and are admitted into a pool if they meet certain criteria, which aims to maximise the economic contribution of migrants. Once in the pool, they may be selected and receive an invitation to apply. Candidates who do not receive an invitation to apply to a specific migration scheme are dropped from the pool after a fixed period.

Before EoI, applications were assessed on a "first come, first served" basis, leading to long queues, which frustrated employers and left short-term demand unaddressed. Caps were quickly reached early in the filing period, while higher-scoring applications submitted later entered the queue.

Figure 5.8. Selection under the EoI model



Source: OECD Secretariat analysis based on Immigration New Zealand's website.

Improving the transparency of procedures for skills recognition and providing language training

Once migrants have entered the country, it is important to ensure that they have opportunities to use their skills in the workplace. To integrate adult immigrants, the point of departure is to take stock of their qualifications and skills. The available evidence suggests that procedures for recognising foreign qualifications and converting them into their host-country equivalents are highly valued by employers and are associated with better labour market outcomes. Yet, few immigrants have their qualifications recognised. One reason is the lack of transparency surrounding the procedures and the large number of actors involved, particularly in heavily regulated professions. Several OECD Member countries have responded by establishing contact points to inform applicants about the process (OECD, 2017[54]). But lack of transparency is still an issue in most countries. Those who do not manage to translate their foreign qualifications into a host-country degree of a similar level should receive assistance to bridge the gap between their qualifications and the requirements of the host country (Box 5.9).

While immigrants have many under-valued skills, they also need to develop new ones – most notably the host country's language. Immigrants who report language difficulties have over-qualification rates that are 25 percentage points higher than similar immigrants with stronger language skills (Damas de Matos and Liebig, 2014[55]). Not surprisingly, governments spend more on language training than on any other component of immigrant integration policy. But in order to be effective, training must account for individual skills needs and be geared towards labour market integration. One way to do this is to provide vocation-specific language training, ideally on the job (Box 5.9). Although such training is costly, it is an investment that appears to pay off (OECD, 2014[56]).

Refugees and humanitarian migrants face higher hurdles than other immigrant groups in having their skills recognized and integrating into the labour market, due to lower education levels and slow transitions to employment (OECD, 2019[33]). Efforts to help refugees find and stay in work – by simplifying pathways to access the labour market, skills recognition, and language support – are critical to helping them to integrate and contribute productively to the skills supply.

Box 5.9. Country examples: Improving the transparency of procedures for skills recognition and providing language training

Improving the transparency of procedures for skills recognition

Austria offers various supports for new arrivals regarding the recognition of foreign qualifications, including contact points, an online portal, and individual grants for recognition.

In **Germany** (Frankfurt), an outreach programme targeted at women with higher qualifications, called "start, change, get ahead" assigns highly skilled migrant women a personal mentor. For the duration of one year, the mentor shares knowledge, experience and networks with the migrant. Parallel to the mentoring, the programme provides professional counselling, upskilling, intercultural training and skills recognition support. Within one year, about half of the participants managed to obtain a job aligned with their qualifications.

Providing language training

In **Belgium** (Flanders), the third step in the immigrant integration programme is to direct participants to the Flemish employment service (VDAB), which offers job-oriented language courses, including "Dutch in the Workplace".

In **Portugal**, vocation-specific language courses are part of the "Portuguese for All" training scheme that is available at no cost to the immigrant population. Vocation-specific language courses are available for the sectors of retail, hospitality, beauty care, civil construction and civil engineering. Vocation-specific language courses are also part of the Intervention Programme for Unemployed Immigrant Workers.

Source: OECD (2017[54]), *Making Integration Work: Family Migrants*, Making Integration Work, https://doi.org/10.1787/9789264279520-en; OECD (2014[56]), *International Migration Outlook 2014*, http://dx.doi.org/10.1787/migr_outlook-2014-en; OECD (2014[57]), *OECD Skills Strategy Diagnostic Report: Austria 2014*, https://doi.org/10.1787/9789264300255-en; OECD (2018[58]), *Skills Strategy Implementation Guidance for Portugal: Strengthening the Adult-Learning System,* https://doi.org/10.1787/9789264298705-en.

Policy recommendations for expanding the pool of available talent

In light of the findings and practices above, the following policy recommendations can help countries expand the pool of available talent (Box 5.10).

Box 5.10. Policy recommendations: Expanding the pool of available talent

- **Improve the channels of recruitment for labour migrants**. Develop a clear labour migration framework that allows for a flexible response to changes in labour market demand. Explore the possibility of skills mobility partnerships, which link training to migration opportunities. Work closely with employers to ensure that certifications are trusted and fit their needs.

- **Improve the recognition of foreign qualifications**. Work with social partners to develop procedures for evaluating and recognising foreign qualifications and skills. Make these procedures the starting point for integration programmes, and raise awareness of their benefits. Provide more opportunities for immigrants with foreign qualifications to take bridging courses.
- **Help immigrants find work**. Put immigrants in contact with employers to help them gain early work experience. Ensure that immigrants benefit from mainstream active labour market policies. Identify and remove barriers to employing immigrants in the public sector. Use mentorship to help immigrants understand how the host-country labour market functions.
- **Challenge harmful biases**. Tackle stereotypes and false perceptions by disseminating fact-based evidence on migration issues. Engage employers through diversity policies and monitor the outcomes. Address discrimination through accessible legal measures and raise awareness about the issue.
- **Improve host-country language skills**. Provide language and introduction programmes, but ensure that these do not delay immigrants from finding work. Where possible, focus on vocational language training and provide language training on the job.
- **Emphasise early childhood education**. Encourage immigrants to enrol their children in early childhood education, starting at the age of three. Encourage immigrants with children to bring them to the host country as early as possible. Avoid concentrating the children of low-educated immigrants in schools.

Making intensive use of skills in the workplace: Improving work organisation and management practices to make full use of employees' skills

Skills use at work can be defined as the level of skills that is observed in a worker's current job. At its core, skills use relates to the way that employers use the skills of employees in the workplace and the alignment of competences of workers to the demand and needs of employers (OECD/ILO, 2017[59]). Skills use is affected both by the extent to which workers deploy their skills in the workplace – which in turn may depend on the incentives they are offered and on their own innate motivation – and by the skills required to carry out a specific job. Some individuals may have an excess supply of skills and not be using them fully on the job; others may have lower skills but fully deploy them at work, because of innate motivation or motivation provided by the way work is organised and managed in the workplace.

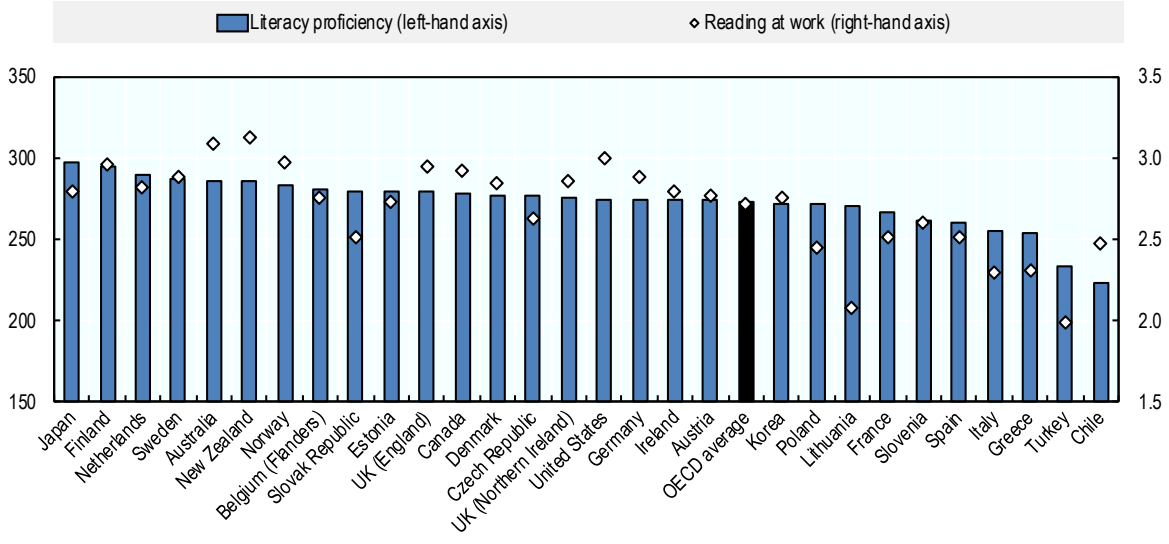
The extent to which skills are used at work matters for individuals, firms and countries. For workers, higher skills use at work is associated with higher wages and higher job satisfaction, over and above the effect of skill proficiency. Within firms, better skills use is associated with higher productivity and lower staff turnover. The use of reading and writing skills is also strongly related to labour productivity and inclusive economic growth at the country level. Strong alignment between the skills and qualifications of workers and those required on the job is also associated with higher labour productivity at the country level (Adalet McGowan and Andrews, 2015[60]).

The challenge: Skills proficiency does not guarantee skills use

A large pool of highly proficient workers does not automatically ensure the effective use of their skills at work. Figure 5.9 demonstrates that country rankings of skills proficiency and skills use at work differ.[1] Only a few countries have a similar ranking on both scales. After accounting for workers' occupation and firm characteristics, skills proficiency explains only a small part of the variation in skills use.

Figure 5.9. Skills proficiency and skills use across OECD PIAAC countries

Average proficiency scores and average skills use at work among the working 16-65 year-old population



Note: For reading at work (skills use indicators) the scale goes between 1 "Never" and 5 "Every day". Proficiency scores range from 0 to 500.
Source: OECD (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

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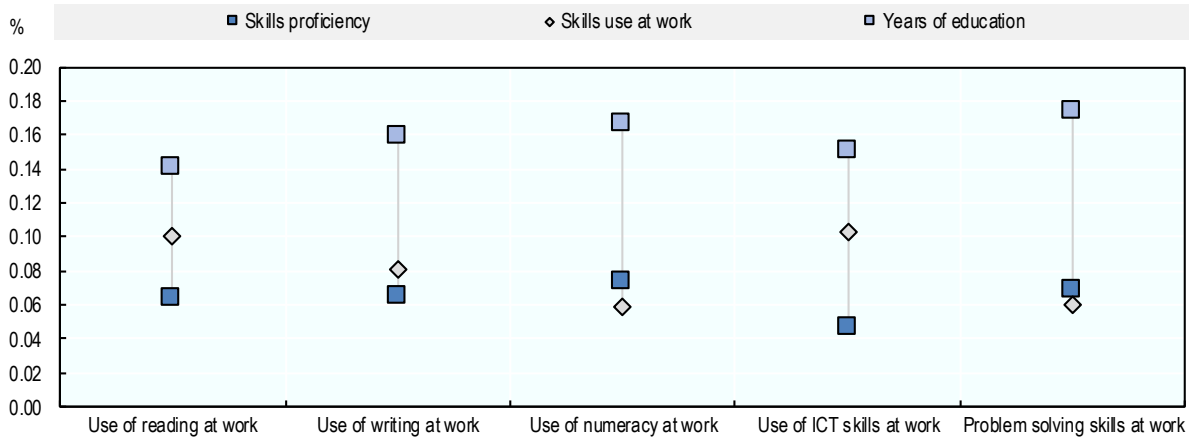
Workers who make more frequent use of key information-processing skills - literacy, numeracy, problem solving and information and communications technology (ICT) skills - tend to have higher wages. Figure 5.10 shows that, controlling for education and skills proficiency, workers who use these skills more frequently at work earn higher wages. This positive relationship holds across each type of skill but it is strongest for the use of ICT and reading skills.

More effective skills utilisation has also been linked to greater job satisfaction and employee well-being (OECD, 2016[61]). For this reason, the concept of skills utilisation has sometimes been closely associated with that of job quality (e.g. Green et al. (2013[62]), with spill-over effects into life satisfaction more generally as well as better health. Evidence from PIAAC shows that skills use relates to the likelihood of being extremely satisfied at work, once skill proficiency, educational attainment, gross hourly wages and other socio-demographic characteristics are controlled for (OECD, 2016[61]).

Figure 5.10. Wage returns to education, skills proficiency and skills use

Percentage change in wages associated with one standard deviation[1] increase in each of skills proficiency, skills use at work and years of education[2]



Note:
1. One standard deviation corresponds to the following: 2.9 years of education; 47 points on the literacy scale; 53 points on the numeracy scale; 44 points on the problem solving in technology-rich environments scale; 1 for reading use at work; 1.2 for writing and numeracy use at work; 1.1 for ICT use at work; and 1.3 for problem solving at work.
2. Estimates from OLS regressions with log wages as the dependent variable.
Source: OECD (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

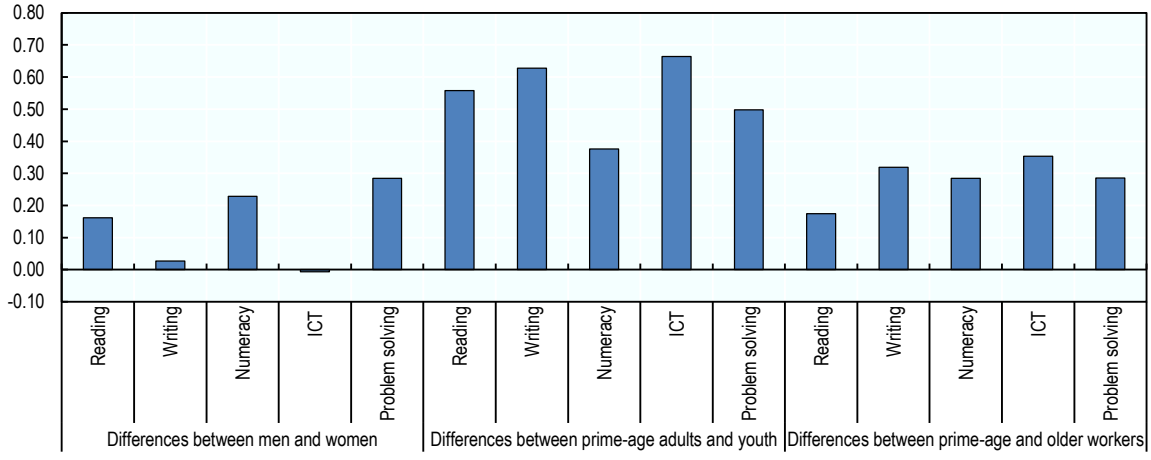
StatLink https://doi.org/10.1787/888933928198

At the level of the firm, better skills utilisation is associated with higher productivity (UKCES, 2014[63]) and lower staff turnover, and some have argued that it also stimulates investment, employee engagement, and innovation (Wright and Sissons, 2012[64]). OECD (2013[10]) shows that the use of reading skills at work correlates strongly with output per hour worked, and the results are robust to the inclusion of controls for skill proficiency.

Socio-demographic and firm characteristics are important determinants of skills use (Quintini, 2014[65]). Figure 5.11 shows that women are less likely to use information-processing skills at work than men, even after controlling for job characteristics and skills proficiency. Relative to prime-age (25-54 years old) and older workers (55-65 years old), young people (16-24 years old) make the least use of information-processing skills at work, including ICT.[2]

Figure 5.11. Use of information-processing skills at work by differences in characteristics

Difference in skills use indicators, OECD average



Note: For reading, writing, numeracy and ICT skills, skills use indicators are scales between 1 "never" and 5 "every day". Problem-solving skills use refers to respondents' answers to "How often are you usually confronted with more complex problems that take at least 30 minutes to find a good solution?" The set of possible answers also ranges between 1 "never" and 5 "every day".
Source: OECD (2018[2]), *Survey of Adult Skills (PIAAC)* (database), 2012/2015, http://www.oecd.org/skills/piaac/.

StatLink https://doi.org/10.1787/888933928217

Good practices

As mentioned above, skills use is affected partly by the extent to which workers deploy their skills in the workplace, which depends on the incentives they are offered, as well as on their own innate motivation (Granados and Quintini, forthcoming[66]). Beyond these, a number of factors both internal and external to the firm can contribute to better skills use, such as work organisation and job design, product market strategies, workplace relations, as well as broader institutional and labour market settings (OECD/ILO, 2017[59]). In terms of factors external to the firm, offshoring may influence the skills required on the job, depending on the nature of the tasks being offshored. Findings tentatively suggest that low-technology offshoring is positively related to the use of information-processing skills at work, while high-technology offshoring can penalise the use of high-level skills in the country (OECD, 2016[61]).

Improving work organisation and management practices

What happens inside the workplace – the way work is organised, and jobs are designed as well as the management practices adopted by the firm – is a key determinant of how skills are used. In particular, better skills use can be achieved by implementing what are known as "high-performance work practices", which include both aspects of work organisation and job design, such as teamwork, autonomy, task discretion, mentoring, job rotation, applying new learning; and management practices, such as employee participation, incentive pay, training practices and flexibility in working hours (Johnston et al., 2002[67]). Based on evidence from PIAAC, these practices explain a substantial part of the variation of skills use across individuals. The share of the variation in skills use explained

by HPWPs varies from 14% in problem solving to 27% in reading. This makes HPWPs the largest contributor to variance in skills use, and generally more than firm size, skills proficiency, industry, occupation[3] or country effects.

That said, HPWPs are most commonly employed in large firms; small- and medium-sized enterprises (SMEs) may find it difficult to put these types of management practices in place due to a lack of a human resources function (Osterman, 2008[68]). Also, low managerial skills can be a bottleneck to workplace innovation, and policies that seek to promote the development of HPWPs may need to be complemented with programmes to develop managerial skills. Consequently, it is important to exercise caution when promoting HPWPs as a viable strategy to improve the use of skills in the workplace (OECD/ILO, 2017[59]).

Many countries have taken policy initiatives to promote better skills utilisation through financing support or awareness campaigns, sometimes making a clear reference to HPWPs, but in most instances generally referring to changes in work organisation. (Box 5.11) presents some examples of good practice.

Box 5.11. Country practices: Improving work organisation and management practices

The **Finnish** Workplace Development Programme ran as a national government programme from 1996 to 2010. Motivated by a belief that sluggish productivity growth was linked to poor skills use, the programme aimed to disseminate new and innovative work, organisational and management practices, models and tools, and to develop a "learning organisation" culture. More than 1 800 development projects in Finnish workplaces were supported by the programme. Qualitative evaluations suggest that these programmes were effective in promoting workplace innovation and productivity.

Under **Singapore's** Enterprise Training Scheme, which was introduced in 2013, employers can apply for public subsidies to support projects aimed at improving skills utilisation. These can include strengthening human resource systems to better link skills acquisition to career trajectories; hiring consultants to review compensation structures to assess capacity to retain skilled workers; or hiring consultants to assess a firm's training needs and use their knowledge of the qualification system, training design and curriculum to adapt available training to the specific needs of the workplace.

New Zealand has singled out the poor utilisation of skills in the workplace as a key policy issue and recognises the introduction of HPWPs as crucial to increase workplace productivity. Policy has been focused on increasing awareness and demonstrating how HPWPs can be applied in the workplace to achieve gains for both employers and employees. Only limited financial resources have been devoted, primarily from the Department of Labour.

Source: OECD/ILO (2017[59]), *Better Use of Skills in the Workplace: Why It Matters for Productivity and Local Jobs*, https://doi.org/10.1787/9789264281394-en; OECD (2016[61]), *OECD Employment Outlook 2016*, https://doi.org/10.1787/empl_outlook-2016-en.

For change to occur in workplaces, employers must be convinced of and invested in the benefits of prioritising and developing human resources (OECD/ILO, 2017[59]). While public interventions can help to incentivise actions by employers, the most successful and sustainable changes that occur at the enterprise level are often industry-led, particularly by employer groups or chambers of commerce. Furthermore, better skills use requires a

number of intertwined local- and business-level considerations that are often outside the traditional portfolio of public policies. It can be helpful therefore to work with an anchor institution or broker (e.g. vocational education and training institution, sector council, human resources consulting firm) that has specialised technical expertise to offer to employers on work organisation, job design, and human resource development practices (OECD/ILO, 2017[59]). In Singapore, as mentioned in Box 5.11, employers can receive subsidies to work with consulting firms to improve the alignment of available training with the specific needs of their workplace.

Good organisational and managerial capabilities can enhance the process of matching workers with job-specific tasks, thus contributing to a better use of skills. Skilled managers are also more likely to appreciate the importance of skills and innovation for the success of a business (Le Mouel and Squicciarini, 2015[69]).

Policies that facilitate diffusion and adoption of good managerial practices are therefore useful, as are those that develop the organisational capabilities of firms. Skills needed by managers range from basic cognitive competencies to skills that are specific to managerial positions, such as networking, management and communication, business and finance planning, or the ability to pitch a business plan to investors. Importance should be attached to targeting training on knowledge and skills gaps and at the local level. To this end, training programmes for managers and heads of companies can benefit from collaboration between business organisations, unions, universities and training entities.

Individuals aspiring to be entrepreneurs also need management-related skills to establish new companies and succeed. To the extent that entrepreneurship skills can be taught, the education system can provide foundations in creativity, the ability to identify opportunities, and resilience in the face of challenges.

Policy recommendations for making intensive use of skills in the workplace

In light of the findings and practices above, the following policy recommendations can help countries make intensive use of skills in the workplace (Box 5.12).

Box 5.12. Policy recommendations: Making intensive use of skills in the workplace

- **Support firms in developing better management practices and work organisation**. Governments can support firms in arranging management practices and the way work is organised to influence the use of skills at work. In particular, they can raise awareness about better skills use, disseminate good practice, develop diagnostic tools to help firms identify room for improvement, promote knowledge transfer, and offer management skill development programmes. Interventions should be targeted at SMEs, who face cost constraints in implementing HPWPs.
- **Follow an integrated approach to improving skills use**. Skills use can benefit from integrated approaches that consider training, employment and economic development priorities. Training providers should work closely with employers to ensure that the skills developed are relevant to the workplace. In employment services, this may involve adjusting performance management systems to evaluate both the quality and quantity of job matches. Economic development agencies should consider the quality of jobs when attracting inward investments, and not overlook incremental innovations that can be achieved in the workplace in favour of large R&D projects.

Reducing skills imbalances: Improving the alignment between the supply and demand of skills

A skills imbalance is a misalignment between the demand and supply of skills in an economy, and can comprise skills mismatches and skills shortages and surpluses. Skills mismatches describe situations when a workers' skills or qualifications exceed or fall short of those required for the job under current market conditions (OECD, 2017[70]; Shah and Burke, 2005[71]). Mismatch can be measured along different dimensions, including skills, qualifications and fields of study. Skills shortages refer to a disequilibrium condition in which the demand for a specific type of skill exceeds its supply in the labour market at the prevailing market wage rate (Junankar, 2009[72]).

The challenge: Misalignment between demand for and supply of skills can be costly

Skills mismatch has negative impacts for individuals, including a higher risk of unemployment, lower wages, lower job satisfaction and poorer career prospects. Over-qualified workers are found to earn about 20% less than workers with similar qualifications who are well matched to their positions (Quintini, 2011[9]). While field-of-study mismatch also entails costs for individuals due to the underuse of specific human capital, individuals generally only incur wage penalties when they work in a job unrelated to their studies if they must downgrade to a job that requires a lower level of qualification (Montt, 2015[73]).

For firms, the impact of skills mismatch is more ambiguous. Older evidence points to a negative impact of over-qualification on firm productivity [e.g. Tsang (1987[74])]. But more recent evidence suggests that over-qualification can have a positive effect on firm productivity in certain working environments: for firms in high-tech or knowledge-intensive industries, those with a higher share of high-skilled jobs and those evolving in more uncertain economic environments (Mahy et al., 2015[75]). The effect of under-qualification on firm productivity is generally found to be negative.

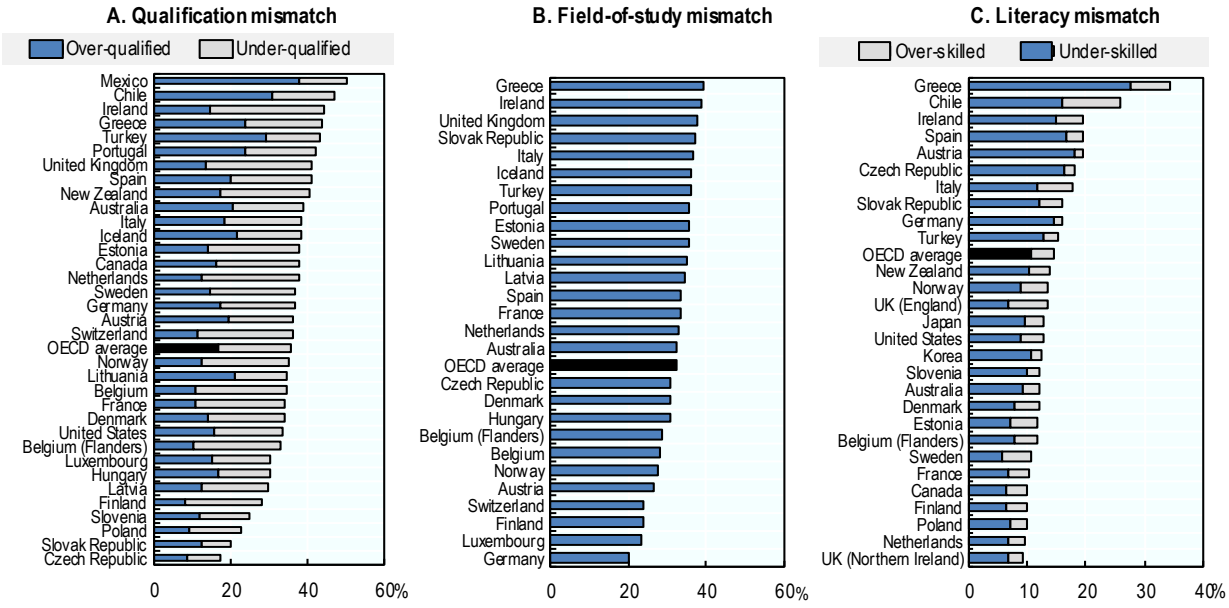
At the economy level, OECD evidence suggests that higher skills mismatch is associated with lower labour productivity through a misallocation of workers to jobs (Adalet McGowan and Andrews, 2015[60]). Field-of-study mismatch can also entail productivity costs for an economy, as mismatched workers may be less productive than well-matched workers since they are missing field-specific skills or may take longer to develop such skills.

Skills shortages increase hiring costs and lower productivity, as vacancies remain unfilled for a longer period of time and firms substitute for less productive workers (Haskel and Martin, 1993[76]; Bennett and McGuinness, 2009[77]). Skills shortages also constrain the ability of firms to innovate and adopt new technologies, which can negatively influence their productivity.

According to the *OECD Skills for Jobs* database, 17% of workers are over-qualified for their jobs, and 32% have a field-of-study mismatch (meaning they are working in a different field than the one for which they studied) (Figure 5.12). Only around 10% of workers is over-skilled for their jobs, according to PIAAC.

Figure 5.12. Qualification, field-of-study, and literacy mismatch

Percentage of mismatched workers, by type of mismatch



Source: Panels A and B: OECD (2018[78]), *OECD Skills for Jobs* (database), https://www.oecdskillsforjobsdatabase.org/; Panel C: OECD (2016[79]), *The Survey of Adult Skills: Reader's Companion*, http://dx.doi.org/10.1787/9789264258075-en; OECD (2013[10]), *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, http://dx.doi.org/10.1787/9789264204256-en.

StatLink https://doi.org/10.1787/888933928236

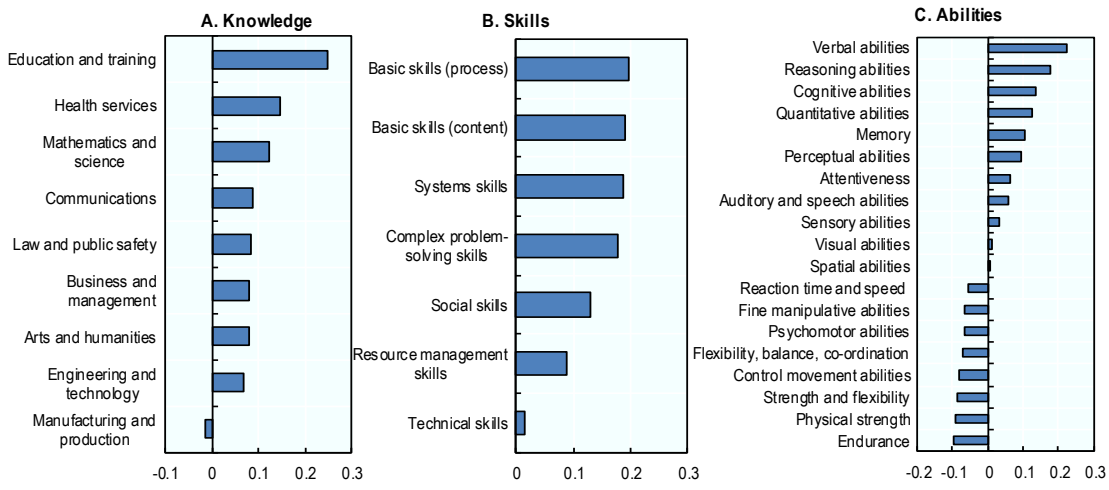
The causes of mismatches are numerous. The fact that over-qualification is much higher than over-skilling may suggest that in many cases people with a higher level of education than is required for the job actually possess skills that are commensurate with the job. This could be due, for instance, to the varying quality of education institutions, both between and within countries, and to the varying quality of students with the same type of education. Field-of-study mismatch may suggest that people are not acquiring the skills that are in demand in the labour market. It may also reflect that many skills are transferable between fields and occupations.

Mismatches do not necessarily indicate a serious problem and can merely be signs of flexible labour markets with high mobility rates. In many cases they are also a reflection of the fact that people make choices about what to study and where to work based on factors other than labour market outcomes, such as personal interest and family responsibilities. However, mismatches can also indicate that skills systems are not sufficiently flexible and responsive to emerging skills needs.

Skills mismatches are closely linked to the concepts of skills shortages and surpluses. For instance, if a given skill is in shortage (demand for the skill exceeds its supply in the labour market at the prevailing market wage rate), then employers may be more likely to hire workers who are under-skilled or under-qualified. The *OECD Skills for Jobs* database sheds light on the type of skills that are in shortage and in surplus across countries. On average across the OECD, shortages are most acute in the knowledge of

education and training, health services and mathematics and science (Figure 5.13). Shortages are also evident in transversal skills like literacy and numeracy (basic skills), systems skills, complex problem solving and verbal abilities. On the other hand, surpluses are found in knowledge of manufacturing and production, and in routine and physical abilities, like endurance, physical strength and strength and flexibility. The intensity of skills shortages and surpluses have worsened in the last decade, calling into question the adaptability of individuals and economies in responding to changing skills needs (OECD, 2018[80]).

Figure 5.13. Skills shortages and skills surpluses in OECD Member countries (2015)



Note: A value of one corresponds to the maximum skills shortage observed across OECD member countries and skills dimensions. A positive value indicates a skills shortage and a negative value indicates a surplus. Skills are ordered by the intensity of shortages.
Source: OECD (2018[78]), *OECD Skills for Jobs* (database), https://www.oecdskillsforjobsdatabase.org/.

StatLink https://doi.org/10.1787/888933928255

Good practices

Many of the practices that can help better align the supply of, and demand for, skills have already been addressed in other chapters of this report: creating opportunities for learning over the life course (Chapter 4); developing skills assessment and anticipation exercises to collect and use high-quality information about skills needs in policy making (Chapter 4); improving access to information and guidance about the labour market (Chapters 4 and 6); making skills visible through recognition of prior learning (Chapter 4); ensuring a responsive education system through linkages with employers and financing mechanisms (Chapter 4); ensuring that individuals are offered incentives to invest in skills that are relevant to the labour market (Chapter 4); and facilitating school-to-work transitions for young people through work-based learning (Chapter 4).

In addition, policies that facilitate labour mobility and flexible labour markets, as well as efforts to map occupational requirements to skills requirements, can help improve the matching of skills supply with skills demand.

Facilitating labour mobility and flexible labour markets

Efforts to facilitate labour mobility within a country and to make the labour market more flexible can promote the reallocation of skills and labour to the regions, sectors and occupations where they are most needed. Possible barriers to internal labour mobility include language, housing, transportation costs, poor recognition of skills or credentials and variation in licensing requirements. Efforts to reduce these barriers can lead to better matching between skills supply and skills demand.

For example, two regions in Belgium (Wallonia and Flanders) recently signed an agreement to promote labour mobility by reducing language barriers. The Flemish Public Employment Service (PES) will develop business-oriented Dutch language courses and modules that can be followed by French-speaking Walloons at the workplace. They will also work to raise awareness among Flemish employers about the benefits of recruiting from Wallonia (OECD, 2019[11]).

Inflexible labour markets that make it costly for firms to hire or fire workers also impede the optimal allocation of skills in the economy. To the extent possible, reducing these barriers can promote a better match between skills demand and skills supply. As highlighted in the OECD Jobs Strategy (OECD, 2018[5]), policies need to strike the right balance between flexibility and employment stability.

Mapping occupational requirements to skills requirements

Most countries approximate the measurement of skills requirements in some way as direct measures are difficult to obtain. Common approximations of skills needs include qualification level, field of study or occupation. However, education credentials do not necessarily map to skills on the job, and there is variability among individuals with the same credentials in terms of their skills (Quintini, 2011[9]). Similarly, the skills and task requirements of an occupation change over time in response to technological and organisational change, customer demand, and the supply of labour (OECD, 2013[10]).

Developing more sophisticated approximations for skills requirements is a challenge facing all OECD Member countries. While the approach is not widespread, several countries link occupational requirements to skills requirements using comprehensive occupational standards or descriptions of what skills are required in each occupation (Box 5.13). Competency-based occupational frameworks facilitate better recognition of skills which helps align the demand and supply of skills in the labour market. By describing occupations based on skills requirements, competency-based frameworks can be a useful tool for individuals seeking a career change that makes use of their existing skills. This type of tool can be particularly useful in the context of facilitating career transitions for older workers, who may not have formal qualifications and prefer to search for new jobs in terms of skills requirements. To maintain currency in the face of changing skills demands, competency-based occupational frameworks need to be updated regularly.

Box 5.13. Country practices: Mapping occupational requirements to skills requirements

The **United States** government sponsors O*NET (Occupational Information Network), a database containing detailed information about the knowledge, skills and ability requirements of more than 800 occupations. O*NET provides information on both the importance of the skill for a particular occupation, as well as the level of skill needed. The database is sponsored by the US Department of Labour/Employment and Training Administration (USDOL/ETA). Originally populated by data collected from occupational analysts, the database is now continually updated by surveys of job incumbents, and input from occupational experts and occupational analysts.

Following O*NET's model, **Italy** also conducts a survey (as part of Professioni, Occupazione e Fabbisogni) to identify the skill, knowledge, values and attitudes required by 800 occupations. An online career guidance tool allows users to browse the employment outlook of each occupation and learn about the types of skills and knowledge that are and will be required by the labour market.

The **European** Skills, Competences, Qualifications and Occupations (ESCO) database links occupations to the knowledge, skills and competences that are essential or optional when working in a specific occupation. Unlike O*NET, ESCO does not provide information on the importance of a skill to a particular occupation, or the level of skill needed.

Source: OECD (2016[81]), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*, https://doi.org/10.1787/9789264252073-en; OECD (2017[70]), *Getting Skills Right: Skills for Jobs Indicators*, https://doi.org/10.1787/9789264277878-en.

Policy recommendations for reducing skills imbalances

In light of the findings and practices above, the following policy recommendations can help countries reduce skills imbalances (Box 5.14).

Box 5.14. Policy recommendations: Reducing skills imbalances

- As discussed in previous chapters, create opportunities for learning over the life course (Chapter 4); develop skills assessment and anticipation exercises to collect and use high-quality information about skills needs in policy making (Chapter 4); improve access to information and guidance about the labour market (Chapters 4 and 6); make skills visible through recognition of prior learning (Chapter 4); ensure a responsive education system through linkages with employers and financing mechanisms (Chapter 4); ensure that individuals are offered incentives to invest in skills that are relevant to the labour market (Chapter 4); and facilitate school-to-work transitions for young people through work-based learning (Chapter 4).
- **Promote labour mobility and flexible labour markets**. Reduce barriers to labour mobility through language training, compensation of associated transportation and housing costs, harmonisation of licensing requirements and recognition of prior learning. To the extent possible, reduce costs associated with hiring and firing employees to promote an optimal allocation of skills in the economy.

- **Support recognition of skills through competency-based occupational frameworks**. Pursue efforts to build a skills-based occupational classification to facilitate career transitions on the basis of skills requirements.

Stimulating demand for high-level skills: Supporting firms' innovative activities, and removing obstacles to growth

A good match between available skills supply and labour market demand is not always positive: workforces can be made up of adults with low skills who are well matched with their jobs (often referred to as a low skills equilibrium). Low skills equilibria hinder growth and economic development, and make economies vulnerable to economic and technological shocks, such as those related to global value chains or the digital transformation.

Innovation, technological development and organisational change depend on having people with the "right" set of cognitive and non-cognitive skills to implement such changes. At the same time, ongoing technological change influences the type of tasks that workers perform on the job, and the skills that they need to perform their tasks.

Co-ordinating skills and education policies with industrial and innovation policies is therefore critical to fostering innovation and growth. By aligning supply-side and demand-side interventions, policy makers can improve the matching of skills demand with skills supply, and in so doing bring about stronger innovation and economic performance.

The challenge: Moving to higher value-added and innovation-intensive activities needs more support

When skills policies are well aligned with industrial and innovation policies, employers can access the skills they need to move their firms to higher value-added and innovation-intensive activities. Innovation — that is, creating, developing and diffusing new products and processes — requires strong science, technology, engineering and mathematics (STEM) skills as well as soft skills and entrepreneurial skills (OECD, 2011[82]). An integrated approach to industrial, innovation and skills policies ensures that such skills are available when employers need them. This type of approach also contains the number of people in unemployment and reduces the length of unemployment spells.

On the other hand, when skills policies are not aligned with industrial and innovation policies, countries and regions may get trapped into "low skills equilibria". Low skills equilibria are characterised by workforces made up of adults with low skills who have little incentive to upgrade their skills since they know it would be difficult to find jobs rewarding their efforts; and by employers who cannot move to higher value-added activities given the low skill levels of the workforce.

To position economies to move to higher value-added and innovation-intensive activities, education, lifelong learning and labour-market-related policies need to be accompanied by policies supporting firms' innovative activities and entrepreneurship, as well as policies levelling the playing field for firms and removing obstacles to growth.

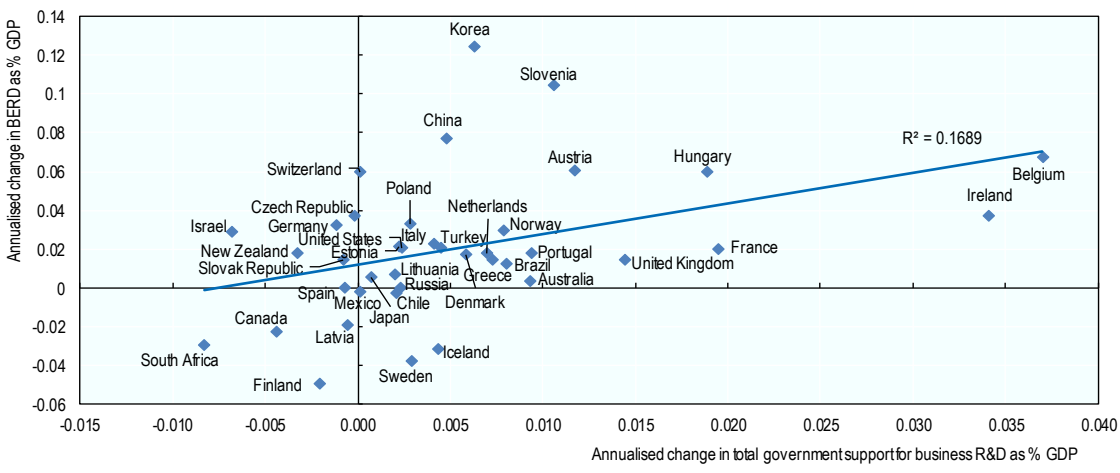
Good practices

Supporting firms' innovative activities

Investing in R&D helps to develop knowledge and skills, spurs innovation and enhances a firm's ability to absorb and exploit its available knowledge base (Cohen and Levinthal, 2000[83]), thus stimulating demand for skills that complement high-tech production. Figure 5.14 shows that government support for business R&D expenditure has been instrumental in increasing R&D intensity in OECD economies (OECD, 2018[84]). Over the 2006-15 period, countries with the largest increase in government support exhibited higher growth in R&D intensity, with changes in government support accounting for approximately 17% of the observed variation in business R&D intensity. China's and Korea's growth in R&D intensity, however, was higher than predicted by their change in measured government support. Italy's Industria 4.0 further provides an example of government reforms that combine investment in R&D with education and training policies to simultaneously boost demand and supply for skills that complement high-tech production (Box 5.15).

Figure 5.14. Changes in government support to business R&D and total business expenditures on R&D, 2006-15

Annualised absolute changes of figures as a percentage of GDP



Note: BERD stands for "Business Expenditure in R&D".
Source: OECD (2017[87]), *OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation*, https://dx.doi.org/10.1787/9789264268821-en based on OECD (2018[84]), *R&D Tax Incentive Database*, http://oe.cd/rdtax.

StatLink https://doi.org/10.1787/888933928274

In addition to government support, fostering collaboration between academic institutions and firms can also support a firm's innovation activities. Developing science-industry links helps to introduce firms to new technologies, facilitates knowledge transfer and spillovers, and enables firms to find the experts they need to move to higher value-added types of activities (Ankrah and Al-Tabbaa, 2015[85]; Scandura, 2016[86]). Such interventions are most easily implemented at the local level, where stakeholders from public, private and academic sectors may engage directly. For instance, faced with a radical technological shift in the mobile phone industry, the region of Tampere (Finland)

successfully transitioned out of the crisis thanks to an open innovation approach that reinforced the innovation system and strengthened ties between the different stakeholders of the region, including science and industry.

Policy measures to encourage collaboration among firms and between firms and universities and research institutions need to pay special attention to engaging small- and medium-sized enterprises, as SMEs are less prone to collaborate, on average (OECD, 2017[87]).

Box 5.15. Country practices: Combining investment in R&D with education and training policies

In 2016, the **Italian** government introduced an ambitious set of industrial policy measures, Industria 4.0, which support the transition of the economy towards higher technology intensity, and higher value-added production more generally. The proposed interventions entail the participation of both public and private agents to broaden investment in three key aspects of the digital transformation: digital infrastructure (by extending broadband and fibre connectivity), innovation (by stimulating investment in R&D and other intangible assets, largely through EUR 13 billion in tax credits), and human capital (by expanding skills for high-tech production). To boost skills for the digital transformation, the government will: expand the education of students and managers in Industry 4.0-related areas; increase the number of students enrolled in VET programmes that complement high-tech production; and create national competence centres that offer training, promote research collaboration and technology transfer. The OECD Skills Strategy noted that the successful implementation of Industry 4.0 in Italy will depend on close integration with other private and public investment programmes that support skills (e.g. active labour market policies).

Source: OECD (2018[88]), *OECD Skills Strategy Diagnostic Report: Italy*, https://doi.org/10.1787/9789264298644-en.

Removing obstacles to growth

Removing barriers to entry and enabling scaling up for firms also encourages demand for higher-level skills, as well as higher productivity. Start-ups introduce new technologies for production, and also encourage better allocative efficiency, by challenging the survival of incumbent firms that are not as productive or innovative. For best results, government efforts should target the most promising start-ups. For instance, tax deductions can be limited to early innovative start-ups that are generally expected to contribute to knowledge creation and bring the most radical innovations to the market (Henderson and Clark, 1990[89]). The Italian Start-up Act, for example, provides stage investments in start-ups, as well as public guarantees on bank loans for promising firms. As banks may be reluctant to fund riskier investment opportunities, the development of alternative forms of finance such as venture capital and private equity can also be instrumental to entrepreneurship, the establishment of start-ups, and to investment in intangible assets more broadly.

Policy recommendations for stimulating demand for high-level skills

In light of the findings and practices above, the following policy recommendations can help countries stimulate demand for high-level skills (Box 5.16).

Box 5.16. Policy recommendations: Stimulating demand for high-level skills

- **Align skills and education policies with demand-side policies**. Strengthen the demand and supply of skills through appropriate industrial policy measures, such as support to investment in R&D and in other knowledge-based assets, while at the same time encouraging greater collaboration between public entities, research institutions and the private sector.
- **Remove barriers to entry and support scaling up for promising start-ups**. Offering tax deductions or other support to innovative start-ups can help these firms to grow, and in doing so encourages the introduction of new technologies, higher productivity and stimulates demand for high-level skills.

Notes

[1] Figure 5.9 shows that country rankings of skills proficiency and skills use at work differ for literacy skills. Note that similar patterns are observed for numeracy skills; see (OECD, 2016[61]).

[2] Contrary to conventional wisdom that young people are more intensive users of ICTs, average ICT use among youth is lower than that among prime-aged workers in all participating countries. However, young people use ICTs consistently more at home than in the office, whereas the opposite is true among prime-aged and older workers.

[3] The use of ICT skills is an exception. For the use of ICT skills at work, occupation explains a larger share of variance in skills use than HPWPs.

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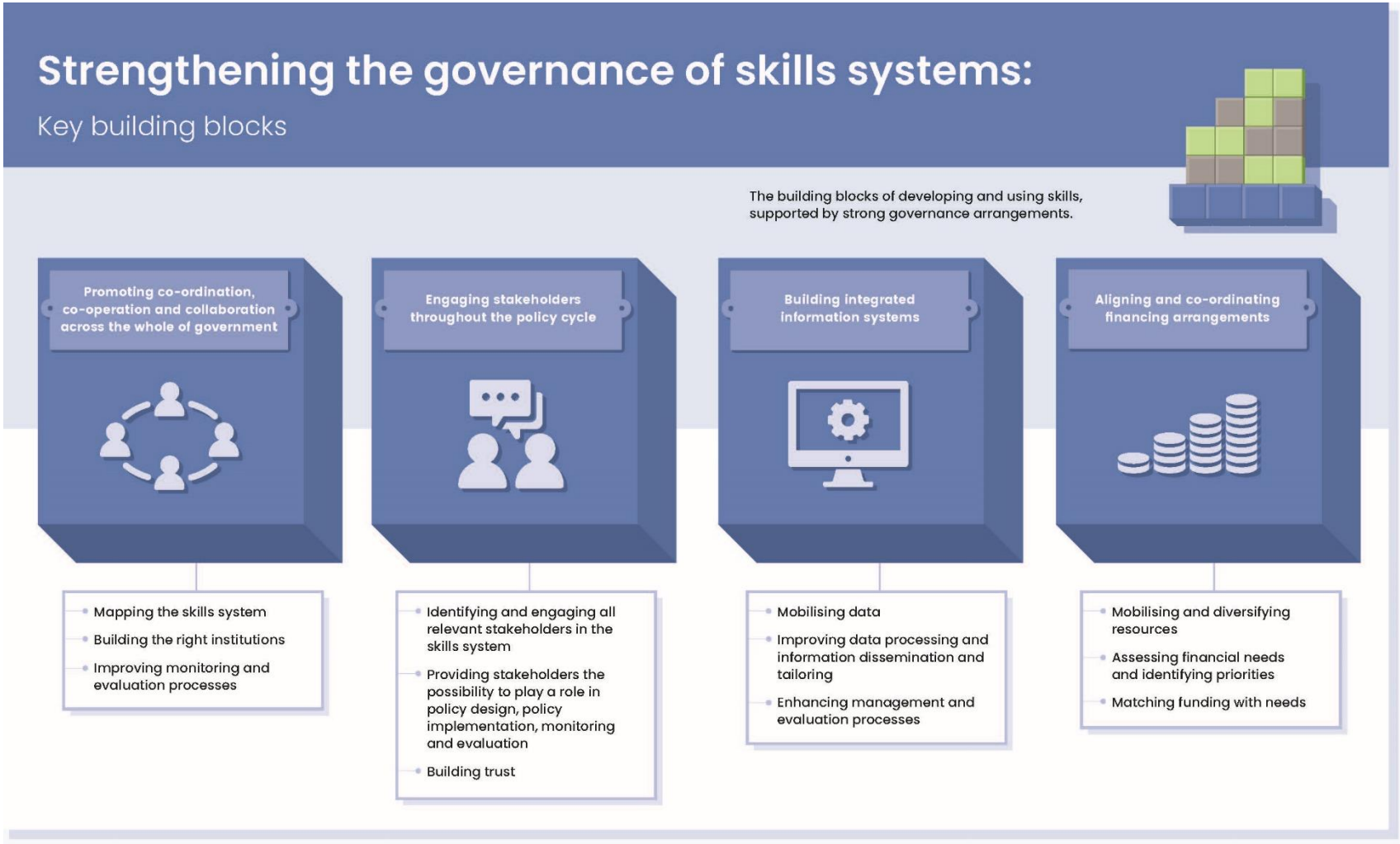
Chapter 6. Strengthening the governance of skills systems

This chapter provides a framework of the policy dimensions required to govern skills systems effectively. It provides examples of how to better calibrate the interaction of the elements of good governance to create processes that are important for the effective functioning and accountability of skills systems. It advocates a whole-of-government approach to skills policies and highlights four policy dimensions relevant to pursuing such a goal: 1) promoting co-ordination, co-operation and collaboration across the whole of government; 2) engaging stakeholders throughout the policy cycle; 3) building integrated information systems; and 4) aligning and co-ordinating financing arrangements.


Strengthening the governance of skills systems:
Key building blocks
The building blocks of developing and using skills, supported by strong governance arrangements.
Promoting co-ordination, co-operation and collaboration across the whole of government
Mapping the skills system
Building the right institutions
Improving monitoring and evaluation processes
Engaging stakeholders throughout the policy cycle
Identifying and engaging all relevant stakeholders in the skills system
Providing stakeholders the possibility to play a role in policy design, policy implementation, monitoring and evaluation
Building trust
Building integrated information systems
Mobilising data
Improving data processing and information dissemination and tailoring
Enhancing management and evaluation processes
Aligning and co-ordinating financing arrangements
Mobilising and diversifying resources
Assessing financial needs and identifying priorities
Matching funding with needs

Box 6.1. Key policy lessons on strengthening the governance of skills systems

Promote co-ordination, co-operation and collaboration across the whole of government. Skills-related policies are rarely the exclusive domain of one ministry or level of government. Higher levels of co-ordination, co-operation and collaboration have the potential to improve skills outcomes. The co-ordination of different policy areas is facilitated if there is a shared conviction that skills are a national priority. Governments should identify and engage with relevant stakeholders and encourage co-ordination between central and sub-national authorities. A good first step is to map all the policies and institutional actors that affect skills development and skills use. Co-ordination efforts should be supported by the right institutions. These institutions can take various shapes. However, it is important that they adopt a "life-course perspective" and put in place effective monitoring and evaluation mechanisms to assess the functioning of the skills system.

Engage stakeholders throughout the policy cycle. The need to engage stakeholders emerges from the complexity and the multiplicity of policy actions that need to be undertaken to improve a country's human capital development and use. Policy makers dealing with complex policy choices need and benefit from stakeholders' expertise and knowledge. Engaging stakeholders also enhances the political legitimacy of policy-making decisions. A first step towards engaging stakeholders is to map all the players in the skills system and identify how and to what extent they interact with each other. It is very important that engagement leads to something tangible in practice, and stakeholders must have opportunities to influence skills policy. However, it is critical that their involvement in decision making does not lead to the "capture" of public institutions by private interests.

Build integrated information systems. As skills systems evolve and become more complex, managing data and information becomes a key policy issue. Governments need effective information systems to collect and manage the data and information that governments and stakeholders produce, analyse and disseminate to ensure that policy makers, firms, individuals and others have access to accurate, timely, detailed and tailored information. Managing complexities requires significant managerial efforts in a number of areas, particularly in regard to accountability and privacy protocols. The first step toward building an integrated information system is to generate and collect all the relevant skills, labour market and learning data. Moving from data to information requires knowing who the end-users are and what their needs are, as well as what the existing information gaps are. A user-centred approach is needed in order to turn data into actionable information.

Align and co-ordinate financing arrangements. Governance and financing are inexorably intertwined. Efforts aimed to increase the level and efficiency of expenditures on skills need to be accompanied by strong institutional capacity. Financial arrangements should rely upon more flexible cost-sharing mechanisms that facilitate integration from multiple sources. Public funds ought to be allocated carefully to promote better policy outcomes and to ensure equitable access to skills development opportunities for all. A first step in prioritising skills investments and expenditures is to assess the financing gaps in the systems. Investment strategies ought to be defined in line with the medium-term strategic priorities of government. Resources need to be allocated in such a way that responsibilities and accountability mechanisms are matched with funding so that those with responsibilities have the capacity and funding to operate at the desired standard of service.

Introduction

Implementing reforms is challenging for governments. The complexity of this task increases when policies involve a wide range of actors and entities, such as different levels of government and stakeholders, and cut across multiple policy sectors (OECD, forthcoming[1]). When designing and implementing inter-sectoral policies, governments often face enormous political and technical challenges, including the need to co-ordinate across different levels of government, to engage with stakeholders, and to define the financial and information aspects of the reform, among others. Furthermore, inter-sectoral reforms are often associated with very complex redistributive trade-offs as they often concern the distribution and redistribution of resources across and between sectors as well as levels of government.

Across the spectrum of policy sectors, policies aimed at improving skills outcomes – skills policies – are a prominent example of complexity. The success of policies to improve the development and use of skills typically depends on the responses and actions of a wide range of actors, including government, students, teachers, workers, employers, trade unions, etc. In many regards, the policy area of skills policies is fundamentally different from other policy areas. On the one hand, investing in education and human capital formation is widely popular across different electoral and political constituencies (Busemeyer et al., 2018[2])) as the value and contribution of education to economic development and social inclusion is broadly recognised. On the other hand, as mentioned in Chapter 1, skills policies are much more complex than many other policies because they are located at the intersection of education, labour market, industrial and other policy domains. It is an inherently complex policy domain that plays a central role in paving countries' development paths by, for example, easing the adoption of new technologies and moving up the value-added chain and by making countries more attractive to foreign direct investment.

Skills policies implicate a large, diverse number of government ministries, levels of governments and stakeholders. For instance, policy making in the labour market arena involves a different set of actors (trade unions, employers' associations, etc.) than in the education arena (parental and student associations, teacher associations, educational institutions, etc.). Furthermore, policy making in the labour market arena usually tends to pursue more centralised approaches aimed at securing the integrity of national labour markets, whereas education policies are often provided and sometimes even financed on the sub-regional and local levels. Thus, both in terms of actor constellations as well as co-ordination efforts across different levels of government, implementing co-ordinated skills policies involves a high degree of complexity.

Governance is not likely to become any easier in the near future. Globalisation, technological progress and demographic change, among other factors, are putting pressure on skills systems, in OECD Member countries and other economies, increasing the need for a lifelong approach to learning. More specifically, as discussed in Chapter 3, these factors (or megatrends) require renewed political and financial commitments to skills policies in three areas: 1) inspiring a culture of lifelong learning and expanding education and training opportunities for the adult population to support their adaptability and resilience in the face of rapid change; 2) reducing inequalities in opportunities among children and schools to ensure that all young adults are equipped with the skills they need for successful careers, enabling them to embrace the impact of technology in a changing world of work; and 3) harnessing the potential of new technologies to expand learning opportunities and spur the development of skills for the 21st century.

As early childhood education and care (ECEC) services and initial vocational education and training (VET) are expanded to reach a greater share of the population and as learning opportunities are expanded to serve the adult population, governments face new challenges in areas where their field of action has been historically limited, increasing the number of actors involved and the complexity of governance arrangements. The expansion of ECEC forces governments to deal with complexities that surpass those encountered at the primary and secondary levels, such as strengthening new regulatory frameworks, managing relationships with providers, putting in place effective quality assurance mechanisms as well as facing political debates about the role of the family vs. the state and markets in providing early childhood education. Expanding educational opportunities in VET adds even more complexity because it requires co-ordination between policy making in the education system itself and actors in the labour market arena, such as businesses and unions. Similarly, adult education and further training entail establishing and managing relationships with employers and education providers and creating new financing and accountability mechanisms.

Current reform efforts addressing the skills system often play out in the context of a more general trend in OECD Member countries to decentralise and delegate the administration, and partly the financing of, social services (Gingrich, 2011[3]), implying that more policies and services will be designed and delivered with or by sub-central authorities, social partners and other stakeholders, whose actions are not always under the control of central authorities. As a consequence, designing governance systems that can ensure a co-ordinated approach to steering and priority setting and are sensitive to particular regional and sectoral needs is challenging.

In fact, the 14 OECD Skills Strategy Diagnostic Reports completed to date show that inherent difficulties in co-ordinating and aligning different policy sectors and actors is among the main challenges impeding more effective and efficient implementation of skills policies. Many of today's skills challenges are rooted in poor governance arrangements across policy areas and levels of government as well as with stakeholders, inadequate information on skills and learning outcomes, and inefficient financing mechanisms. Government structures and bodies are usually designed to advance specific sectoral policies and do not co-ordinate actions across sectors.

This chapter provides a governance framework that could potentially serve as a reference point for ongoing debates about governance reforms in skills policies. It advocates a whole-of-government approach to skills policies and elaborates on four relevant policy dimensions.

A whole-of-government approach to skills policies

A whole-of-government approach aims to ensure that policies are coherent, mutually reinforcing (i.e. complementary to each other) and sufficiently flexible to be able to deal with new challenges. In doing so, it aims to strike a good balance between centralised steering and priority setting on the one hand and decentralised and flexible delivery of policies on the other. Good skills governance implicates not only the public sector but also the private sector. Therefore, the whole-of-government approach involves the appropriate stakeholders in decision making in order to ensure that policy decisions are perceived as legitimate by those concerned as well as to make use of the knowledge resources held by stakeholders distributed across different levels of government and policy sectors. Involving stakeholders is therefore likely to improve the effectiveness of implementation processes. Fulfilling the potential of the whole-of-government approach

requires aligning a range of political, social, economic and administrative systems. The exact balance between centralised steering and particular regional and sectoral needs as well as the degree to which private actors are incorporated into decision-making processes is likely to vary across countries depending on political and institutional legacies. This chapter does not advocate a "one-size-fits-all" model in terms of governance regimes, but identifies critical dimensions of governance arrangements (see below) that can serve as a reference point to improve the effectiveness and efficiency of policy making relative to country-specific policy goals and targets (Box 6.2).

Box 6.2. What is a whole-of-government approach?

A whole-of-government approach aims to improve the horizontal and vertical co-ordination of government activity in order to improve policy coherence and the use of resources. A whole-of-government approach thus promotes and capitalises on synergies and innovation that arise from involving and engaging with a multiplicity of stakeholders, while also providing seamless service delivery to individuals and businesses. It requires government bodies, regardless of type or level, to work across portfolio boundaries in order to achieve shared goals and to provide integrated government responses to policy issues. Such an approach applies to both formal and informal working methods, and to the development, implementation, and management of policies, programmes and service delivery. A capacity to genuinely collaborate fundamentally enables a public administration to be more responsive to the needs of government and individuals.

The term "whole-of-government" is broad and applies to both central and sub-national (regional and local) levels and policy areas. More importantly, it also includes the relationship between government and external actors.

Source: Adapted from OECD (2011[4]), *Estonia: Towards a Single Government Approach*, OECD Public Governance Reviews, https://dx.doi.org/10.1787/9789264104860-en.

More concretely, the whole-of-government approach aims to pursue long-term skills policy agendas, establishing strong institutions that monitor and evaluate the implementation and outcomes of policy reforms, engaging stakeholders directly to share the ownership (or burden) of the policy reform within a framework in which the public sector remains accountable for the quality and accessibility of services, and, finally, at addressing asymmetries between the winners and losers of reform processes. The latter point – the redistributive implications of policy reform – can often become a major obstacle in the design and implementation of policy reforms. In order to prevent gridlock in the later stages of the implementation process, it is, therefore, crucial to involve stakeholders in earlier stages of the decision-making process. At the same time, public authorities need to remain in the "driving seat" so as to avoid the "capture" of public institutions by private interests.

Following the broad definition of skills policies in the OECD Skills Strategy, the policy areas to be studied cover not only education and training policy in the narrow sense but also labour market, industrial and tax policies to the extent that they have implications for the development and effective use of skills in the labour market and alignment with industry skill needs. After applying the OECD Skills Strategy approach to 11 countries, 4 main challenges have been identified as critical to adopting a holistic approach to skills policies. These challenges constitute the four policy dimensions introduced in this chapter and refer to the capacity to promote co-ordination, co-operation and collaboration across

the whole of government, to effectively engage stakeholders throughout the policy cycle, to build integrated information systems to support the development and implementation of skills policies, and to design effective and efficient financing arrangements to ensure that sufficient and sustainable resources are available to skills systems. More specifically:

- **Promoting co-ordination, co-operation and collaboration across the whole of government** allows governments to co-ordinate the design and implementation of skills policies across responsible ministries (horizontal co-ordination) and levels of government (vertical co-ordination) to ensure coherence. Skills policies should also be guided by a shared vision and be designed and implemented to be complementary to each other. Policies are complementary when they are mutually reinforcing, which is to say they generate better outcomes when combined and co-ordinated than when they are implemented separately or in piece-meal fashion (Trapasso and Staats, 2018[5]). Furthermore, co-ordination across different ministries and levels of government does not imply a centralised "one-size-fits-all" steering model, as co-ordination within a whole-of-government approach should be flexible enough to take into account particular regional or sectoral needs. The important point, however, is that individual ministries or agencies should not pursue their own policies without co-ordinating with other relevant ministries or agencies as appropriate.
- **Engaging stakeholders throughout the policy cycle** helps to ensure that relevant actors in the private sector, such as trade unions, businesses, employers' associations, etc., are meaningfully involved in the design, implementation, and evaluation of skills policies. Engaging stakeholders improves policy relevance, flexibility and sustainability as well as assists in the effective implementation of policies. There are many different ways in which the public and the private sectors can co-operate and interact concerning skills policies, and countries differ with regard to the forms and extent to which they engage with private actors. In any case, it is important to prevent private actors from abusing their involvement in public decision making for particularistic needs. Hence, governance regimes and forms of interaction between the public and private sector need to be designed in a manner that ensures that actors engage in collective problem solving rather than particularistic bargaining and lobbying.
- **Building integrated information systems** that provide information and knowledge helps policy makers and stakeholders make decisions that lead to better skills outcomes. Information and data about skills needs, learning opportunities and good policy practices should facilitate evidence-based policy making. Yet, to achieve this result, in many countries the quality of information needs improving. Administrative data should be integrated into common – longitudinal – systems that are able to translate this into accessible and tailored information that can help partners to make informed skills choices. Information systems should become user-centred and should take advantage of recent technological advances. While building infrastructures for the collection and management of quantitative data, governance and accountability systems also need to tap into sources of qualitative data such as skill needs assessments from employers' associations, school inspections or other qualitative assessments.

- **Aligning and co-ordinating financing arrangements** can facilitate the allocation of resources towards investments with the highest social returns. Politically speaking, implementing funding formulas that direct resources to the localities with the greatest need may be difficult because wealthier regions might oppose this redistribution of resources. A whole-of-government approach can help to overcome these kinds of regional asymmetries better than an uncoordinated approach. Furthermore, it is important to adopt a long-term, strategic approach to financing skills, and to facilitate the resource allocation process, it is imperative to provide a clear framework that specifies which actors contribute with funding and to what extent. Again, skills policies are different from other policies because many of the benefits of present-day investments in education materialise in the long term only, i.e. usually after the end of the political mandate of today's decision makers. Hence, in order to pursue a long-term strategy in skills formation, it is imperative to establish institutional frameworks that protect education and other skills investments against competing, short-term financial needs of other sectors.

This chapter elaborates on each of these four challenges and provides selected case studies to illustrate different arrangements countries may wish to consider to strengthen the governance of their skills systems. Governance arrangements and practices are partly the consequence of the unique historical, cultural and socio-economic circumstance of countries and societies. Therefore, there is no one-size-fits-all solution to the governance of skills systems. However, despite their institutional differences, countries can learn from each other and adopt modified versions of the successful practices implemented elsewhere. To this end, case studies of country-specific experiences can be an important source of inspiration and insights.

The challenge: Promoting co-ordination, co-operation and collaboration across the whole of government

Skills-related policies are rarely the exclusive domain of one ministry or level of government. Most commonly, skills issues lie in the sphere of action of a number of bodies within the public administration, and their policies and actions are inherently intertwined, requiring co-ordination along both the vertical and horizontal dimensions. The vertical dimension refers to the linkages between higher and lower levels of government, and the horizontal dimension refers to co-operation arrangements between sectors (e.g. ministries), regions or between municipalities.

For example, in Sweden, vocational education and training has traditionally been organized by each municipality. To stimulate the development towards a broad supply of education and training corresponding to the needs in the different regions, the Government altered the conditions and introduced a new state grant in 2017. The current state grant requires cooperation between at least three municipalities on the planning and supply of education and training at the regional level. Consultation is also required with the Public Employment Services and with the various actors responsible for regional development.

Even though policy co-ordination along the horizontal and vertical dimensions clearly creates added value, many countries struggle to achieve it. The main policy challenges that countries encounter in this regard are:

- **Putting skills policies at the top of the government agenda**. The co-ordination of different policy areas is facilitated if there is a shared conviction that skills are a national priority. Even though investing in education is widely popular with voters and policy makers, educational investments that generate benefits primarily in the long term compete with public spending on other areas with more immediate short-term payoffs. Furthermore, education reforms often involve significant political costs, given the ideological and polarised nature of the political debates, the fact that most of the population has strongly held beliefs about which education model is best for their children, and the underlying conflicts of interest between some of the actors. The political challenge then is to keep education at the top of the political agenda despite these competing interests and to agree that improving the level of skills should be the main target of the policies.
- **Identifying and engaging with relevant stakeholders**. Effective and politically legitimate governance of skills systems requires policy makers to engage with relevant stakeholders in the field. The challenge here is to identify the relevant actors while balancing out potential power asymmetries between highly organised special interest and the often weakly organised and more diffuse collective interests. Engagement with stakeholders needs to go beyond the classic tripartite bodies representing business, labour and state interests found in many countries. In the context of lifelong learning, the success of skills policies is increasingly influenced by and dependent upon a larger number of stakeholders, representing emerging sectors of the economy such as new tech firms and training providers as well as new types of employees (the self-employed and atypical workers), many of whom are not necessarily well represented by traditional institutions or entities. In developing an encompassing skills strategy, it is important to appeal to both the traditional and well-established associations in the economy as well as those representing newly emerging interests.
- **Encouraging co-ordination between central and sub-national authorities**. The development of a whole-of-government approach to skills policies is in many countries hampered by the complexities of multi-level governance arrangements, which distribute policy-making authority unevenly across different policy sectors. For instance, in many countries, the authority for education policy is delegated to sub-national governments or divided between the central and regional governments. In contrast, labour market and lifelong learning policies are often the responsibility of federal/central agencies in order to ensure joint standards on national labour markets; but in other countries, the local governments are important in administering and financing these policies. In any case, oftentimes the policy-making authority for different elements of a comprehensive set of skills policies are distributed unevenly across different levels of government, turning co-ordination across these levels of government into a significant challenge for policy makers. Irrespective of which model is present in different countries and how responsibilities are defined between levels of government, the most effective mechanism to avoid growing disparities is for central government to remain responsible for defining common standards of the appropriate levels of skills for each level of educational attainment, and training models for all regions, and to evaluate the efficiency of the different actors and policies.

Good practices

With the view of enhancing their whole-of-government approach, some countries have targeted the improvement of both horizontal and vertical co-ordination efforts (OECD, 2010[6]). For instance, horizontal co-ordination has been facilitated by creating specific structures, such as inter-ministerial committees and commissions; or has involved creating fully-fledged ministries with broad responsibilities and powers that encompass traditionally separate sectors. Box 6.3 presents examples of dedicated bodies for the oversight of skills policies in Ireland, Norway and Germany.

Box 6.3. Country practices: Dedicated bodies for the oversight of skills policies

Ireland

Ireland adopted National Skills Strategy 2025 in January 2016. A key part of the Strategy is the creation of a new skills architecture. Within this framework, the country has created a National Skills Council (NSC) to oversee research, provide advice on the prioritisation of identified skills needs, and secure delivery of the identified needs.

The council includes a mix of private and public representatives. Four members are appointed from an enterprise/employer background. The chief executives of the main agencies active in higher education, VET and lifelong learning (Higher Education Authority [HEA], Further Education and Skills Service [SOLAS], Quality and Qualifications Ireland [QQI], as well as Science Foundation Ireland [SFI], and the enterprise agencies IDA Ireland and Enterprise Ireland) , as well as representatives of the Department of Education and Skills, the Department of Business, Enterprise and Innovation, and the Department of Employment Affairs and Social Protection and the Department of Public Expenditure and Reform, are also members of the National Skills Council. The chairs of the Council of Presidents of the Universities and Institute of Technologies are also invited to be members of the NSC.

Information is provided to the Council from three key sources: the Regional Skills Fora, the Skills and Labour Market Research Unit, and the Expert Group on Future Skills Needs.

The Regional Skills Fora help foster stronger links between employers and the education and training sector and facilitate orienting education and training providers towards labour market needs, at a regional level.

The Skills and Labour Market Research Unit in SOLAS provides a range of statistical reports including the National Skills Bulletin.

The Expert Group on Future Skills Needs carries out research, analysis and horizon scanning in relation to emerging skills requirements at thematic and sectoral levels.

Norway

Norway has adopted a National Skills Strategy for 2017–21. To oversee the implementation of the strategy, Norway has established a Skills Policy Council. The council is composed of members from the government, the eight main social partners, a representative from the regional authorities and a representative from the voluntary sector and adult-learning associations. The Minister of Education and Integration heads the council.

The council is tasked with the oversight of the implementation of the strategy. The council also discuss deliveries from the Future Skills Needs Committee (see Box 4.3 in Chapter 4 for more details) and provides input on new policy initiatives. In 2019, the Skills Policy Council will revise the National Skills Strategy.

Norway has also established a directorate for lifelong learning, Skills Norway, which is housed in the Norwegian Ministry of Education and Research. Its role is to co-ordinate the priority areas highlighted in the National Skills Strategy. Skills Norway is also responsible for international co-operation and acts as national co-ordinator for the European Agenda for Adult Learning, representing the sector and implementing the agenda.

Germany

Germany has a long tradition of corporatist decision making in the field of vocational education and training (see below). In 2004, a new type of alliance between government and business actors (employers' associations) was established – the "Pact for Vocational Education and Training". This pact was established as an alternative and in response to previous attempts by the government of the time to establish a training levy, which was largely opposed by employers. Instead, employers agreed with the government to expand learning opportunities for youth in firm-based traineeships, which should eventually segue into regular apprenticeship training. This initial version of the pact was heavily criticised by unions because of its largely voluntary character. Consequently, unions refrained from participating in this type of skills council.

In 2014, however, the pact was re-launched as the national "Alliance for Initial and Further Education". A crucial difference between the new alliance and the old pact is that now, unions are involved as co-operation partners as well. The Alliance also involves a number of other stakeholders and actors such as the Federal Employment Agency, the KMK (a central institution that manages the horizontal co-ordination of education policy across *Länder*), the federal ministries for labour affairs, business and education as well as representatives of the *Länder* ministries for labour and social affairs. Thus, the Alliance indeed pursues a whole-of-government approach by aiming at consensual co-ordination of different stakeholders in the system. Furthermore, different from the largely voluntary previous pacts, it passed more binding decisions and recommendations, in particular, a commitment on the part of employers to increase the number of apprenticeship places by 30 000 on a yearly basis.

Source: Ireland Ministry for Education and Skills (2016[7]), *Ireland's National Skills Strategy 2025*, https://www.education.ie/en/Publications/Policy-Reports/pub_national_skills_strategy_2025.pdf, OECD (2018[8]), *Skills Strategy Implementation Guidance for Portugal: Strengthening the Adult-Learning System*, http://dx.doi.org/10.1787/9789264298705-en; Dalbak, K. (2018[9]) *Mandate of Official Norwegian Committee on Skill Needs*, https://kompetansebehovsutvalget.no/mandate-of-official-norwegian-committee-on-skill-needs/; Allianz für Aus- und Weiterbildung, (2014[10]), *Alliance for Initial and Further Training 2015–2018* ,www.aus-und-weiterbildungsallianz.de/AAW/Navigation/EN/Home/home.html.

Some countries have created bodies to address specific policy challenges. For example, in 2016, Latvia's Cabinet of Ministers approved the Plan on Adult Education Governance Model 2016-20 with the overall objective of increasing participation in adult education and training to 15% by 2020, and created the Adult Education Governance Council (AEGC) to implement the plan. The objective of the plan was to develop a unified and sustainable adult-education system, to ensure the sharing of specific policies and responsibilities at the sectoral level, and to ensure access to high-quality adult education for the population regardless of their background (Box 6.4).

Box 6.4. Country practices: A dedicated body to boost participation in adult learning

In **Latvia**, the Adult Education Governance Council (AEGC) was created in early 2017 to implement and monitor the Plan on Adult Education Governance Model 2016-20. It was created to avoid the historical fragmentation of responsibility in adult education, and to establish a clear division of functions, information exchange and regular communications among the stakeholders involved. The AEGC is an inter-institutional body with representatives from sectoral ministries, municipalities, private companies, educational institutions, adult education centres and non-governmental organisations (NGOs), under the supervision of the Ministry of Education and Science. The State Education Development Agency provides the secretariat and the analytical unit functions of the AEGC.

The main functions of the AEGC are to: 1) review and approve priorities for adult education, taking into account labour market information and sectoral expert councils, labour force forecasts, and demand and supply disparities in the labour market; 2) determine the priority adult education target groups and sectors; 3) confirm the content of the training to be implemented, including the complementarity of the training between the different target groups; 4) decide on the principles for allocating funding; and 5) conduct a regular evaluation of the results of the implementation of adult education.

Prior to the new governance model, adult education in Latvia was provided in a fragmented way by several ministries, within the framework of their competences. The new model is oriented towards effective resource management (including financial resources), based on a transparent and coherent operation system taking into account regional needs and medium and long-term labour market forecasts, so as to offer adults high-quality education through the development of a coherent regulatory framework.

Source: Adapted from (OECD, 2018[11])*Skills Strategy Implementation Guidance for Slovenia: Improving the Governance of Adult Learning*, https://dx.doi.org/10.1787/9789264308459-en.

Governments can also create central oversight bodies to co-ordinate and oversee the training that horizontal and vertical co-operation requires. These bodies can include members of relevant ministries and public bodies and advise as to the content and provision of training, as seen in the example of the Directorate-General for the Qualifications of Public Servants in Portugal (Box 6.5).

Box 6.5. Country practices: A dedicated body to improve civil servants' skills

Portugal has put in place a multi-dimensional governance framework of policies and institutions to improve the skills of civil servants. The Directorate-General for the Qualifications of Public Servants (Direção-Geral da Qualificação dos Trabalhadores em Funções Públicas, INA) is responsible for establishing a new model to co-ordinate and improve professional training in the public administration.

The legislation involves important governance aspects, as it creates two new bodies with consultative and co-ordinating roles to strengthen professional training in the public service. These are the General Council for Professional Training (Conselho Geral de Formação Profissional, CGFP) and the Commission for Co-ordinating Vocational Education and Training (Comissão de Coordenação da Formação Profissional, CCFP).

The CGFP is presided over by the minister in charge of public administration and includes the heads of relevant public services and agencies. Its role is to advise the government in the definition and ongoing improvement of professional training in the civil service. The CCFP has a co-ordinating role and involves the heads of services responsible for training in the public service at the national, regional and local levels.

Source: OECD (2018[8]), *Skills Strategy Implementation Guidance for Portugal: Strengthening the Adult-Learning System,* http://dx.doi.org/10.1787/9789264298705-en.

There are also possibilities beyond the creation of specific bodies. For example, requiring sign-off on policy proposals relating to skills by all skills relevant ministries, rewarding cross-government co-operation in performance agreements, engaging with strategic planning and programming processes. Finally, stronger governmental interaction can also be promoted by integrating budgets and adopting mechanisms to improve transparency and facilitate accountability and performance monitoring.

Regarding vertical co-ordination between levels of government, countries have found different ways to organise their skills systems, ranging from fully centralised systems where the central government funds, and is the sole provider of, education services to more decentralised systems characterised by higher degrees of responsibility attributed to both local authorities and private stakeholders. As countries move towards higher levels of decentralisation, the risk that each level of government and sector works in isolation increases. If the result is a silo approach to policy making, there is an increased risk that policies will not be well aligned, producing administrative frictions, inefficiencies in the implementation process and greater risk of inequalities. Hence, some federalist countries such as Switzerland and Sweden have devised means of horizontal co-ordination between sub-national governments in order to ensure a co-ordinated approach to policy making, while still allowing regional authorities to set their own priorities (Box 6.6).

Box 6.6. Country practices: Co-ordination mechanisms between central and local governments

The HarmoS-Konkordat in Switzerland

Switzerland has one of the most decentralised education systems among OECD Member countries. Local as well as regional (cantonal) governments are for the most part in charge of providing and financing education with the federal government only retaining a limited role for quality assurance. The high degree of decentralisation in the governance of education has led to the development of quite significant differences regarding the institutional design of education systems across the 26 Swiss cantons. For example, in the German-speaking part of Switzerland, the dual apprenticeship training model is the predominant type of VET, whereas school-based VET is more common in the French- and Italian-speaking parts.

Responding to perceived problems regarding the comparability of educational degrees as well as concerns related to mobility and permeability between and across the different cantonal education systems, Switzerland passed a constitutional reform in 2006. This reform required the cantons to co-ordinate with each other to achieve a harmonisation of central aspects of cantonal school systems, in particular with regard to regulations concerning compulsory education, the duration and goals of individual educational levels and the recognition of educational degrees. For that purpose, the EKD (the Swiss Conference of Cantonal Education Directors) passed an inter-cantonal agreement in 2007 – the HarmoS-Konkordat, which came into force on 1 August 2009.

Following this date, individual cantons were obliged to decide whether they would subscribe to the regulations of the agreement, i.e. become a full-fledged member. In the case the number of member cantons did not pass the critical threshold of 18 cantons (out of 26) until 2015, the federal government was empowered to act unilaterally to achieve co-ordination of education. At the 2015 deadline, 15 cantons had joined the Konkordat, whereas 11 stayed out (most of them in response to popular referenda rejecting membership). Thus, the HarmoS-Konkordat did not become formally obligatory for the whole of Switzerland, but given that the majority of cantons adhere to the agreement, it has a *de facto* harmonising effect on the whole of Switzerland.

The example of the HarmoS-Konkordat shows the challenges, but also the potential of co-ordinating education policy horizontally and vertically, in particular in systems with a long history and tradition of decentralised educational governance.

Decentralised governance and central steering in Sweden: The reform of the Swedish Schools Inspectorate

At the beginning of the 1990s, Sweden started a comprehensive process of decentralisation and privatisation of its school system (Lundahl, 2002[12]). A first step in this process was to delegate governance and financing competencies from the national level to the level of municipal local governments. Secondly, the government allowed independent (private) schools to be established. Since these schools are still financed with public funding, this effectively established a voucher system, increasing the range of options to choose from for students and parents (Baggesen Klitgaard, 2008[13]).

In such a decentralised system, a central challenge is to achieve some degree of co-ordination and coherence through central steering while maintaining the autonomy of local governments and independent schools. For that purpose, Sweden established a

national schools inspectorate within the National Agency for Education in 2003. The Swedish Schools Inspectorate (Skolinspektionen) was formed as a separate agency in 2008. The agency is responsible for supervision and quality assurance with regards to pre-schools, compulsory schools, upper secondary schools and municipal adult education. The primary aim of the Swedish Schools Inspectorate is to contribute to school improvement and development. The overall goal is a school system where all children have equal rights to a good education and knowledge in a secure environment. The latter is important because the Swedish Schools Inspectorate does not only scrutinise schools, but also provides advice and consulting in order to support individual schools.

Source: Schweizerische Konferenz der kantonalen Erziehungsdirektoren (2015[14]), *Bilanz 2015. Harmonisierung der verfassungsmässigen Eckwerte gemäss Artikel 62 Absatz 4 BV für den Bereich der obligatorischen Schule: Verabschiedung und Veröffentlichung*, https://edudoc.ch/record/117954/files/pb_bilanz2015_d.pdf; Baggesen Klitgaard, M. (2008[13]), "School Vouchers and the New Politics of the Welfare State", https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1468-0491.2008.00410.x; Lundahl, L. (2002[12]), "From Centralisation to Decentralisation: Governance of Education in Sweden", https://10.2304/eerj.2002.1.4.2.

In short, promoting co-ordination, co-operation and collaboration across the whole of government improves governments' ability to design and implement skills policies that are coherent and complementary[1] while minimising the transaction costs that result from co-ordination. Improving the alignment of policies across ministries and levels of government promises to deliver a more effective and cost-efficient way to deliver policies and services relative to the specific policy goals and targets that countries set for the long-term development of their skills strategies.

Policy recommendations for promoting co-ordination, co-operation and collaboration across the whole of government

In light of the findings and practices above, the following policy recommendations can help countries promote co-ordination, co-operation and collaboration across the whole of government (Box 6.7).

Box 6.7 Policy recommendations: Promoting co-ordination, co-operation and collaboration across the whole of government

- **Map the skills system.** Skills policy actions need to involve a large number of ministries, government entities, and levels of government as well as private stakeholders. Co-ordination should involve sub-central authorities that are responsible for designing and delivering skills policies. A good first step is to map all the policies and institutional actors that affect skills development and skills use. It is very important that the mapping is complete and that it does not overlook important actors, including those who may not be very visible or are marginalised.
- **Build the right institutions**. Not only is there a need to co-ordinate many different entities and actors, but this co-ordination also needs to be meaningful and supported by the right institutions. Countries could pursue different options here such as establishing: 1) an inter-ministerial committee (reflecting a more top-down, bureaucratic approach); 2) a council involving stakeholders, which may be

more inclusive, but could run the risk of taking more time to make decisions or fall prey to particularistic interests; or 3) a body of voluntary horizontal co-ordination actors among regional bodies with guidance from the central level. Independent of its concrete shape, a government could put in place one co-ordinating institution that connects all relevant government actors and stakeholders to ensure better co-ordination between actors along the horizontal as well as vertical dimensions. For example, a country can create an agency to take charge of skills policies or a national council to co-ordinate different policy areas. Such entities could assess the impact of all policy reforms on skills outcomes (skills proofing of policies). In doing this, it would be important to adopt a "life-course perspective" on skills development, i.e. to pursue policies that ensure smooth transitions for individuals between the different stages of education and employment. Above and beyond formal co-ordination between government agencies and stakeholders, co-ordination can also happen informally, for instance, when ministerial cabinets engage in a continuous policy dialogue across different policy portfolios.

- **Improve monitoring and evaluation processes.** It is paramount that policy co-ordination yields tangible benefits to justify the efforts made to build a coherent and complementary skills policy framework. To achieve this result, governments can monitor and evaluate their programmes to assess the functioning of the skills system and its capacity to generate high skills equilibria. A good skills system must produce evidence about its impact, and transform the evidence into knowledge that can be disseminated and used to ensure that skills policies are both effective and efficient relative to country-specific policy goals and targets.

The challenge: Engaging stakeholders throughout the policy cycle

The need to engage stakeholders emerges from the complexity and the multiplicity of policy actions that need to be undertaken to improve a country's human capital development and use. First, policy makers dealing with complex policy choices need and benefit from the expertise and knowledge of stakeholders, allowing for more effective forms of policy making. Second, engaging stakeholders also enhances the political legitimacy of policy-making decisions, which is important as complex policy decisions often involve a number of trade-offs and political costs.

Achieving a better skills system that generates good policies and outcomes is a societal goal. It cuts across many aspects of life in society. Its achievement thus requires more than a focus on results and better information or new technologies. It requires a wide range of actors and stakeholders, such as governments, businesses, trade unions and other non-governmental organisations, professional associations, post-secondary and higher education institutions, as well as the general public, to come together to pursue a common strategy towards this goal. No single partner is in a position to attain this complex goal unilaterally. As a result, government actors and societal stakeholders need to work together in order to develop and implement skills policies that spur the development of relevant skills and promote the effective use of those skills

In this regard, it is important to ensure that the involvement of stakeholders in decision making does not lead to the "capture" of public institutions by private interests. Well-designed governance frameworks are needed to incentivise private actors to take into

account collective concerns in their decision making. However, to improve the effectiveness and efficiency of skills policies, as well as to ensure more equitable skills outcomes, stakeholders must also be able to influence skills policy. These stakeholders include students, education institutions, trade unions, business associations, the unemployed, those employed in non-standard work, small- and medium-sized enterprises (SMEs), etc. as well as voters and the general public who eventually are asked to foot the bill for higher levels of investment in skills formation via their taxes.

Rather than being the passive object of lobbying efforts, governments willing to strengthen the governance of skills systems need to engage with stakeholders proactively. But engaging stakeholders in skills systems can prove difficult for a variety of reasons. The key challenges to stakeholder engagement are:

- **Building stakeholders' trust**. A first, structural obstacle to public dialogue is lack of trust. This issue is particularly important in countries without a strong legacy of social partnership and stakeholder involvement in policy making. Powerful "path dependencies" affect and constrain the way governmental and societal actors perceive and regard each other. Stakeholders may have had negative experiences interacting with the public sector, potentially perceiving the public sector as largely impervious to their concerns and proposals. Vice versa, public authorities may be wary of stakeholder involvement fearing that private actors abuse and misuse public resources to further particularistic goals. Overcoming this mutual lack of trust requires a genuine effort on the part of both sides. Furthermore, government officials and authorities may continue to be ambivalent about their new role in a system that opens policy making to stakeholders. On the one hand, governments need to actively reach out to societal stakeholders to enhance the legitimacy and responsiveness of skills policies. On the other hand, they may fear that the engagement process could open the floodgates to unsustainable or unrealistic demands from stakeholders.
- **Engaging stakeholders takes time**. Another issue negatively affecting stakeholder engagement is the amount of time needed to build effective dialogue. The numerous actors within the skills system need to establish common institutions and processes that structure the process of stakeholder engagement and facilitate the creation of a shared narrative about skills needs and policy responses. This requires collaborating with stakeholders on a regular basis and providing them with actual opportunities to contribute to policy making. As there is positive feedback between "voice" and "loyalty" (Hirschman, 1970[15]), being durably involved in a public policy dialogue may positively affect the systemic endowment of social capital and trust in government. Allowing stakeholders to actively contribute to and shape policy making increases the "stake" they hold in the joint effort of devising a co-ordinated skills policy. On the other hand, engaging stakeholders increases the effectiveness of public policies in particular during the implementation phase, contributing to a win-win scenario that raises the overall co-ordination capacity of the system.
- **Resourcing adequately**. Stakeholder engagement needs to be properly resourced. Building public dialogue requires human resources and funds, especially if the public sector needs to play a pro-active role in engaging those groups that are not currently represented in traditional policy dialogues. Government policies providing resources to stakeholder engagement and mobilisation should focus on societal interests that are facing inherent difficulties getting organised (diffuse

societal interests shared by many) rather than strengthening already well-organised special interests. Resources need to be allocated on a permanent basis to secure the sustainability of policy dialogue and should be made contingent on stakeholders complying with minimum standards regarding their internal organisation (e.g. decision making should be based on democratic procedures). Conversely, discontinuity of resources, and then of policy dialogue, will negatively affect the level of trust in the system. This, in turn, will make policy dialogue more difficult and even more resource-intensive in the future.

- **Resolving conflicts of interest**. Finally, some skills reforms can improve the welfare of some groups of stakeholders, while negatively affecting others. Even though the process of stakeholder engagement could and should strive to find consensual solutions to policy problems, there may be instances where policy solutions involve difficult trade-offs. Government actors cannot stay completely out of these political conflicts but should remain a neutral arbiter to the greatest extent possible in order to ensure that stakeholders, in general, remain committed to the collective effort. Increasing the input from and involvement of empirical research may help to reduce potential conflicts of interest, as evidence-based policy making can contribute to developing a foundation of objectivity shared and recognised by all involved.

Good practices

Innovative ways of engaging stakeholders throughout the policy cycle are already being used in different countries. Instead of solely focusing on holding policy consultations, for instance, some economies are already targeting the development of more continuous and sustainable conversations with stakeholders about the strategic direction of skills policies. For instance, Austria, Germany (Box 6.8), the Netherlands (Box 6.9), or the Scandinavian countries, who have a long tradition of corporatism and social partnership, have developed a set of institutions and deliberative councils that regularly involve major stakeholders in decision-making processes. In contrast, other countries with a more liberal pluralist institutional framework of interest mediation such as Canada, the United Kingdom or the United States, have engaged with stakeholders in a more open and ad hoc manner (OECD, forthcoming[1]).

Both approaches have value, but it is increasingly clear that the current and future challenges in co-ordinating skills policies require a new approach to the involvement of stakeholders and therefore also a very different role for government actors. Actively seeking advice from stakeholders and encouraging collaboration between state and societal actors require very different approaches to interest mediation than the traditional public consultation model. Instead of being the passive object of lobbying efforts, government officials must be prepared to convene, facilitate, enable and partner with various groups and interests within a given country to find consensus regarding societal goals and the accompanying public policies and programmes (Lenihan, 2012[16]). At the same time as they are engaging with private actors, government actors need to make sure the collective concerns remain at the top of the government's agenda. This also requires that governments retain an independent capacity to intervene in and direct policy-making processes.

In short, the public sector should facilitate a process of public debate that is centred on stakeholders. In fact, the difference between stakeholder consultation and stakeholder engagement, or dialogue, is simple, but powerful. Engagement gives all the participants a

sense of control over the process and its results. In exchange, it asks everyone to take ownership of the issue, along with some responsibility for its solution. This can have a dramatic effect on the tone and dynamic of the whole process. If the stakeholders are an essential part of designing a solution, they will assume some ownership of, and responsibility for, that solution.

Box 6.8. Country practices: Involving major stakeholders in decision-making processes

Both employers, as well as unions, have historically been highly involved in the governance of vocational education and training in **Germany**. The institutional foundations for the modern-day system of dual apprenticeship training were laid down in the 1969 Law on Vocational Education and Training (Berufsbildungsgesetz, BBiG). Over the course of the 1970s, the central institutions in this system – in particular the Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BIBB) were established. The BIBB is the central gate-keeping institution in the system of VET governance. It is in charge of collecting statistical information about the VET system as well as conducting research on future skills needs. Furthermore, it manages and organises the process of reforming and updating training regulations.

Training regulations are formally passed as ministerial decrees but are based on a process of collective decision making, involving actors from different federal ministries, *Länder* governments as well as employers' and professional associations and unions. Decision-making processes aim at achieving consensual solutions between the different stakeholders involved. When the institutional framework was relatively young, this consensus-oriented approach led to a lengthy decision-making process. In the case of metal and electrical occupations – which are central to Germany's export-driven economy – this lasted more than 15 years. Consequently, starting in the 1990s, government actors put more pressure on stakeholders to speed up the decision-making processes. Nowadays, due to policy learning, the process of reforming previous training regulations or creating new occupational profiles in emerging sectors of the economy takes about one to two years. From 2006 until 2015, 130 training occupations were reformed or modernised through this process, while 19 new training occupations were created.

In **Canada**, Future Skills was launched in spring 2018 as part of the Government's plan to ensure that Canada's skills development policies and programs are prepared to meet Canadians' changing needs. Future Skills will examine major trends that will have an impact on national and regional economies and workers, identify emerging skills that are in demand now and into the future, develop, test and evaluate new approaches to skills development and share results and best practices across public, private and not-for-profit sectors to support broader use of innovative approaches across Canada. Future Skills will include the Future Skills Council and the Future Skills Centre. The Future Skills Council, staffed by technical and subject matter experts from the public, private and not-for-profit sectors, will consult and gather perspectives on how technologies and other emerging trends are creating new opportunities for Canadians. It will then advise the Minister of Employment, Workforce Development and Labour on national and regional skills development and training priorities. The Future Skills Centre will be run at arm's length from the Government of Canada by the Ryerson University, the Conference Board of Canada and Blueprint ADE. It will partner with and fund projects that are led by groups such as provincial and territorial governments, Indigenous governments and for-profit and not-for-profit organisations to help Canadians make informed training decisions by identifying emerging in-demand skills required now and in the years to come.

Source: Busemeyer, M. (2009[17]), *Wandel trotz Reformstau: Die Politik der beruflichen Bildung seit 1970, http://www.mpi-fg-koeln.mpg.de/pu/mpifg_book/mpifg_bd_65.pdf*; Bundesministerium für Bildung und Forschung (2018[18]), *Berufsbildungsbericht 2018*, https://www.bmbf.de/pub/Berufsbildungsbericht_2018.pdf; Bundesinstitut für Berufsbildung (2017[19]), *Ausbildungsordnungen und wie sie entstehen;* Government of Canada (2019[20]) *Future Skills*, https://www.canada.ca/en/employment-social-development/programs/future-skills.html.

As there are many different stakeholders, there are also several different ways to engage with stakeholders. For one, the public sector can engage with stakeholders in informal and bilateral meetings. Informal meetings are particularly useful if a government wants to assess existing differences among stakeholders, before embracing a given reform. However, while engaging in informal deliberation with stakeholders, government actors need to pay attention to maintaining the overall transparency of the deliberation process in order to maintain its public legitimacy.

Furthermore, co-operation can be achieved in more formal ways, such as through the creation of specific institutions or councils that guarantee the continuity of the dialogue among the main stakeholders. While designing the institutions and deliberative forums, it is important to pay attention to the potential trade-off between the number of stakeholders involved and the effectiveness of decision making. If the number of stakeholders and bargaining partners is too large, the deliberative process runs the risk of becoming too cumbersome, which could effectively lead to a rather superficial and ineffective involvement of stakeholders. Government actors can prevent this situation by encouraging stakeholders to organise themselves before participating in the deliberation process, i.e. by appointing spokespersons for a particular sector or group of stakeholders. However, the concomitant danger in this situation is that the number of stakeholders drops too low, triggering concerns about the broadness of the group of stakeholders involved. There is no simple solution to these trade-offs as countries differ widely with regard to the number and kinds of societal stakeholders they have. Governments should be aware, however, of the challenges related to the organisation and involvement of societal actors in public policy making.

Lastly, the government can also be pro-active and participate in existing fora created and managed by stakeholder organisations/entities. Besides promoting skills policy dialogue, this methodology has the advantage of demonstrating to stakeholders that their perspectives matter to the government. It is not only a matter of governments engaging stakeholders but also about ensuring that governments themselves are willing to be engaged. In addition, this pro-active approach can be important when stakeholders are particularly weak and marginalised due to their lack of organisation, fiscal or administrative capacities (including lack of organised representation) that negatively affect their ability to engage with policies and dialogues.

In several OECD Member countries, there are mixed bodies in which public authorities and private sector representatives co-operate to improve skills policies, among others. It is the case of the Netherlands, for example, where the Social and Economic Council (SER) plays a key role in advising the national government in matters related to skills development and use (Box 6.9). The SER is independent of the government but partnered with the OECD and the Dutch government when an OECD National Skills Strategy Project was conducted in that country, between 2016 and 2017 (OECD, 2017[21]).

Box 6.9. Country practices: Advising the government in matters related to skills development

The Social and Economic Council of the **Netherlands** advises the Dutch government and parliament on key points of social and economic policy. It also undertakes activities arising from governance tasks and self-regulatory matters and functions as a platform for discussions of social and economic issues. The council consists of independent Crown-appointed members, employers, and employees.

Established in law by the Social and Economic Council Act (Wet op de Sociaal-Economische Raad), the SER is the main advisory body to the Dutch government and the parliament on national and international social and economic policy. The SER is financed by industry and is wholly independent of the government. It represents the interests of trade unions and industry, advising the government (upon request or at its own initiative) on all major social and economic issues.

The SER also has an administrative role. In addition, it helps the government enforce the Works Councils Act (Wet op de ondernemingsraden).

Source: SER (2019[22]), "What does the SER do ?" https://www.ser.nl/en/SER/About-the-SER/What-does-the-SER-do ; OECD (2017[21]), *OECD Skills Strategy Diagnostic Report: The Netherlands 2017*, http://www.oecd.org/publications/oecd-skills-strategy-diagnostic-report-the-netherlands-2017-9789264287655-en.htm

In recognition of the centrality of stakeholders in the policy cycle, the Australian government has developed a public sector toolkit of good practices for effectively engaging them in policy design and delivery. This toolkit identifies key elements for success and common challenges and is applicable across policy areas (Box 6.10).

Box 6.10. Country practices: A government toolkit to engage stakeholders in policy design and delivery

The government of **Australia** has produced a toolkit that helps the public sector engage stakeholders in different policy domains, including skills policies. The toolkit identifies the key elements of effective engagement:

- **Involve the right people**. To identify the right stakeholders, it should be clear why there is a need to engage them and what the scope of the engagement will be. Who needs to know? Who has an interest? The answers will ultimately determine the composition of the target group of stakeholders. What are the risks of not engaging particular stakeholders?
- **Use a fit-for-purpose approach**. There is no one-size-fits-all approach to engaging stakeholders — each interaction should be tailored. Stakeholders have different expertise, objectives and capacity to engage with government. Don't assume that what worked for one situation will work for another. Often a mix of approaches will be needed and you may need the flexibility to adjust your approach quickly.

- **Manage expectations**. Stakeholders should have a clear understanding of how their contributions will be used, and the degree of influence their input will have as approaches to policy design and implementation are formulated. When stakeholders' expectations cannot be met, anger, frustration or cynicism may result, which will affect the current and future relationship with the government. The purpose of the engagement and the role of participants, including how their input will be used, need to be clear from the beginning.
- **Use the information**. Engagement is not just about collecting information. It involves a process of responding to information to shape and improve the quality of the initiative. Information from stakeholders may also indicate whether the engagement approach itself needs to change. Greater organisational benefits will flow if you share lessons learned from engagement across the agency, particularly where your agency regularly engages with the same set of stakeholders on a variety of issues.

The toolkit also assesses common challenges to stakeholder engagement. These include: 1) the purpose of the engagement may not be clear; 2) stakeholders may have limited capacities and resources (time, people and money) to engage with the government; 3) government may have limited experience and skills to implement effective stakeholder engagement; 4) unfocussed dialogue may cause stakeholders to highlight a range of issues that are important to them but not related to the government initiative that is the object of the engagement; and finally, 5) failure to review and evaluate may negatively affect the capacity to assess the results of the approach. The engagement plan should include review points throughout the policy design and implementation, with the flexibility to adjust the approach if needed.

Source: Department of the Prime Minister and Cabinet (2013[23]), *Cabinet Implementation Unit Toolkit*, https://www.pmc.gov.au/sites/default/files/files/2014%2011%2014-%201%20Planning%20-%20Final.rtf.

A good example of how to involve stakeholders in policy cycles is provided by the "Next Generation Engagement" sector partnerships in the United States. This methodology gives centrality to the private sector and individuals. Stakeholders identify policy issues and define solutions that guide the policy actions of the public sector – which did not participate in the policy dialogue. Stakeholders are also involved in the implementation of policy action so that they also develop a strong sense of ownership towards their policy proposals (Box 6.11).

Box 6.11.Country practices: Involving stakeholders in policy cycles at the sub-national level

In the "Next Generation Engagement" sector partnerships in the **United States**, the stakeholders are fully empowered, and policy agendas are based on industry-determined priorities, not public programmes. Public partners from workforce development, economic development, education and others work together to convene and support Next Gen Sector Partnerships. Since Next Gen Sector Partnerships are organised around the topic that interests business leaders most (i.e. what it takes to ensure that their company thrives) they should be sustainable over time. Over 50 next generation partnerships exist across the United States, with concentrations of them in Colorado, California, Oregon, and Arizona; more are emerging in Montana, Texas, Hawaii and Louisiana; and interest is increasing in at least a half dozen other states.

Below are some examples of this kind of partnership:

- The Gallatin Valley Manufacturing Partnership in Bozeman, Montana is designing a nine-day manufacturing curriculum module to be offered in local high schools throughout the region. The curriculum was developed by a team of manufacturers working with education partners and will be taught by guest instructors from regional manufacturing companies. It includes guest speakers, field trips to local manufacturing companies, and classes offered by Gallatin Community College.
- The East Bay Advanced Manufacturing Partnership in California created a customised education pathway for their top, critical occupations, which quickly became the common framework for multiple high schools and junior colleges called upon the Workforce Board to align curriculum.
- A new Northeast Louisiana Healthcare Partnership has engaged nearly 40 healthcare organisations (large hospitals and small rural clinics) in building a real career pathway system that improves advancement from a certified nursing assistant (CNA) to a licensed practical nurse (LPN), including new certificate add-ons along the way. This partnership is also developing process and legal agreements for an acute care network that allows large hospitals to use under-utilised bed space and skilled nursing staff in rural hospitals.
- The Kingman and Mohave Manufacturers Association in Arizona created a freight-sharing programme that allowed for regional manufacturers to co-ordinate shipments, saving on transportation costs. Member manufacturers also helped create a shared training space in a member company's facility, co-funded a mobile training unit for upskilling existing workers in rural manufacturing facilities, and significantly expanded existing manufacturing-related apprenticeships.
- The Lane County Technology Collaborative, a sector partnership convened by the local workforce board in Eugene, Oregon, brings together over 30 technology companies to collectively tackle shared issue areas. In its first six months, the Collaborative successfully secured a direct flight from Eugene to Silicon Valley. Members cite this as a powerful early win that allowed them to get to the harder issues at stake: improving technology education in the K-12 system, and creating a new computer science curriculum in local colleges.

Source: Next Generation Sector Partnerships (2019[24]), "Next Generation Sector Partnerships - What Are Next Gen Sector Partnerships?" http://www.nextgensectorpartnerships.com/aboutnextgenerationpartnerships/.

Policy recommendations for engaging stakeholders throughout the policy cycle

In light of the findings and practices above, the following policy recommendations can help countries engage stakeholders throughout the policy cycle (Box 6.12).

Box 6.12. Policy recommendations: Engaging stakeholders throughout the policy cycle

- **Identify and engage all relevant stakeholders in the skills system**. A first step to engaging stakeholders is to map all the players in the skills system and identify how and to what extent they interact with each other. Once this mapping exercise of stakeholders is completed, governments should engage all appropriate actors in working to achieve meaningful skills reforms. While doing so, they should keep in mind the trade-off between the extent of stakeholder engagement and the effectiveness of collective deliberation. In addition, public authorities should put in place a structure (body, entity, taskforce, etc.) able to engage with stakeholders in a pro-active fashion, including by participating in fora organised by stakeholders.
- **Provide stakeholders with the opportunity to play a role in policy design, policy implementation, monitoring and evaluation**. Governments should take advantage of the knowledge accumulated by stakeholders, who can be empowered in addition to being consulted, to the best of their capacities, to actively participate in the design of skills policies. Importantly, for stakeholder engagement to become a common practice, there is a need for sustainable funding, specialised resources, venues, etc. Government policies aimed at improving organisational capacities should pay attention to and strive to balance out inherent power asymmetries in the system of interest mediation. Continuity and sustainability in stakeholder engagement are needed to generate mutual trust and to give credibility to the public authorities involved in the public dialogue.
- **Build trust**. It is very important that engagement leads to something tangible in practice. Stakeholders need to see that at least some of their recommendations are actually implemented by public authorities and that monitoring and evaluation are used as a learning process rather than a way to sanction poor outcomes. By proving the centrality of stakeholders, public authorities may improve the level of trust in the skills system and attract even more actors to engage. Eventually, the changes implemented on the basis of the public dialogue should generate positive incentives for stakeholders to improve their skills performance. At the same time, stakeholders can contribute to building the trust of government actors by demonstrating their willingness to take into account collective concerns rather than simply pursuing their particularistic goals.

The challenge: Building integrated information systems

Strong information systems that collect and disseminate relevant information regarding skills development and use are critical to ensuring that governments and stakeholders are able to make informed choices leading to better skills outcomes.

But putting in place integrated information systems is complex; the main challenges associated with doing so are:

- **The multiplicity of data sources**. Skills are used and developed at multiple stages of life. A comprehensive and effective information system should be able to collect data from early childhood education and care, primary, secondary and post-secondary education, social services and the workforce. It should also be able to collect and process information from both qualitative and quantitative sources. Ideally, information systems are capable of tracing individuals' education

and employment careers throughout different stages of the lifecycle. These longitudinal data systems require significant efforts in terms of data collection and linkage since data originates in different bodies. They may also trigger public concerns about data protection, which need to be taken seriously. Moreover, schools' data systems are not always integrated across regions or cities, and their compatibility with wage records and other state-provided services is not guaranteed. Special attention needs be taken when collecting data on disadvantaged populations, who can be under-represented in standard surveys.

- **The multiplicity of end-users**. Information systems should be designed to satisfy the information demand of a large and heterogeneous number of agents. The type of information and the level of aggregation vary depending on the user as well as the country context, as some countries without a strong tradition in the collection of education-related data often lack a commensurate "user culture". Students and their families may need programme or school-level information. In contrast, most of the time policy makers and researchers need individual-level data that allows them, for example, to identify heterogeneity in the effects of a particular intervention or to target certain programmes or services to specific groups of individuals. The targeting of programmes and services in particular regions often triggers conflict about the distribution and redistribution of scarce resources (as discussed above). Hence, information systems and research evidence based on these data can contribute to pacifying distributional conflicts by showing the effectiveness of targeted measures. Furthermore, most users have limited capacities to deal with and process large amounts of complex data. Therefore, it is imperative to produce information that is tailored to multiple end-users' needs and to disseminate it in a way that is understandable and easy to assimilate.
- **Management of complexities**. Overseeing the functioning of integrated information systems is complex, and requires significant managerial efforts in a number of areas. The system needs to be maintained, and data-sharing agreements need to be signed and updated as necessary. Its correct functioning requires appropriate funding, and clear responsibility and accountability mechanisms are needed to build trust among stakeholders. The overseeing body needs to define a set of procedures and rules and have concrete plans to execute them. Furthermore, privacy issues need to be managed with extreme caution. Protecting confidential information should be a top priority, and sound security practices must be implemented to avoid data misuse and potential data breaches. Finally, procedures and policies need to be aware of the risk of negative side effects of setting up large-scale information systems, such as "teaching to the test" practices or the wholesale delegation of public responsibilities to private business actors whose primary interest is in making a profit.

Good practices

As skills systems evolve and become more complex, managing data and information becomes a key policy issue. Improving data-system capacity and disseminating relevant information on skills at all levels has the potential to contribute to a better design of skills policies and to reduce skills mismatches and shortages by better aligning education and training decisions with labour market demand, such that the end result is improved skills use, employability, productivity and competitiveness (ILO, 2017[25]). In this regard, it is important to design information systems that are sensitive to both quantitative (statistics) as well as qualitative information (e.g. input from stakeholders).

Effective information systems collect and manage the data and information that governments and stakeholders produce, analyse and disseminate to ensure that policy makers, firms, individuals and others have access to accurate, timely, detailed and tailored information. Relevant data and information include, among others, the results of skills assessment and anticipation exercises, information on learning outcomes (including tracer studies that assess student labour market outcomes at a specified time after graduation, normally between six months and five years), labour market intelligence, information on where to access learning opportunities, as well as information from evaluations of public policies.

Policy makers and a broad range of stakeholders, including students, families, employers, trade unions as well as education and training institutions have strong needs for quality and accessible information to make better and more informed decisions.

Better and more integrated information systems can help policy makers to evaluate current policies and to monitor whether current investments and programmes are serving individuals effectively and raising the level of skills of the population. For example, policy makers may be interested in analysing the results of skills assessment and anticipation exercises or tracer studies (ILO, 2017[25]; OECD, 2017[26]) and learn about skills gaps and trends to better anticipate future skills needs. An accurate assessment of under-supply or over-supply of skills in strategic sectors of the economy can help policy makers steer education and training policies to sectors with more skills imbalances and to better design financial incentives and mechanisms to incentivise skills investments in those areas (OECD, 2017[27]). Furthermore, quantitative and qualitative information about changing skill requirements can help improve and further develop the curricula of general education and more specific training programmes.

Students, parents and career counsellors also need reliable information for career choices purposes. For example, information about expected employment and earnings following graduation in specific institutions and degrees can help them set better expectations and make more informed career-related decisions (Leventoff, Wilson and Zinn, 2016[28])). Likewise, education and training institutions may need information on the main trends in skills needs to align programme offerings to labour market demand, as well as employment statistics to monitor the performance of their graduates. Finally, employers and firms may also benefit from information on the availability of skills in their productive areas and the main trends in skills supply and demand to adjust their production inputs and processes accordingly.

Recognising the need to build integrated information systems, the states of Illinois, Indiana and Maryland in the United States provide examples of information systems that have developed with the purpose of improving the linkages between education and workforce data (Box 6.13).

Box 6.13. Country practices: Developing information systems to improve the linkages between education and workforce data

In the **United States** in recent years, Illinois state agencies responsible for economic and workforce development and education have come together to ensure stronger linkages between education and workforce data. Indiana and Maryland each have legislation establishing the membership and duties of governance councils for management of information systems. These bills aim to ensure that longitudinal data systems help answer policy questions that are important to stakeholders by requiring participation from stakeholders across the education and workforce spectrum.

Illinois

As part of the effort to strengthen data used to promote training in high-demand sectors and occupations, the office of the governor and seven state agencies teamed up to create the Illinois Longitudinal Data System (ILDS).This federated system matches data from multiple agencies for specific tasks, while keeping data stored in individual agency databases and leaving agencies to administer separate intake systems. Agencies with responsibility for initial and higher education as well as for labour market outcomes share data through the ILDS. Linked datasets can assist government and qualified third parties with performance management and reporting, research and analysis, and consumer information initiatives. The ILDS uses an identity resolution system at Northern Illinois University to match data and return information to agencies. To ensure privacy and security, ILDS is aligning security protocols across agencies. ILDS also developed a standardised vetting process for external researchers to access data with agency approval.

Indiana

Indiana's cross-agency council is legislatively mandated to oversee the state's longitudinal data system, the Indiana Network of Knowledge (INK). Among its duties are implementing a detailed data security plan, ensuring compliance with privacy laws, establishing INK's research agenda, creating policies to respond to requests from state and local agencies, the general assembly, and the public, and developing public access to aggregate INK data. The governance committee must include representatives from the Department of Education, the Department of Workforce Development, the Commission for Higher Education, private colleges and universities as well as the business community.

Maryland

Similarly, Maryland Senate Bill 275 established the Governing Board of the Maryland Longitudinal Data System (MLDS) Center. The board includes members representing K-12, higher education, and labour; five members appointed by the governor, one of whom must be a data systems expert; and three at-large positions filled by a workforce development professional, a teacher, and a parent. The board's responsibilities include providing general oversight and direction to MLDS, establishing its research agenda, approving the annual budget, ensuring adherence to relevant privacy laws, creating an annual report to the governor and General Assembly, and setting policies for the approval of research requests from the legislature, state and local agencies, and the public. Since the bill's passage, the Governing Board has emerged as a model for transparency. The Governing Board holds public quarterly meetings and makes meeting agendas and minutes available on MLDS's website.

Source: Leventoff, J., B. Wilson and R. Zinn (2016[28]), *Data Policy Toolkit. Implementing the State Blueprint*, https://careertech.org/resource/data-policy-toolkit, Peña, C. (2017[29]), *From Patchwork to Tapestry Collaborating to Maximize Data Utility*, https://www.nationalskillscoalition.org/resources/publications/file/WDQC-Tapestry-Brief-final-web-compressed.pdf.

Further examples of comprehensive information systems in the governance and use of education-related data analyses are the Estonian Education Information System (EHIS) and the Danish DREAM system (Box 6.14). These systems effectively incorporate data from different programmes and bodies, use it to feed back into systems to improve quality and relevance for those learning and training, and provide monitoring and performance evaluation to ensure efficacy and preserve security while performing these longitudinal data analyses.

Box 6.14. Country practices: Comprehensive information systems in educational governance

The Estonian Education Information System

Estonia has attracted international attention recently because of its strong performance in the 2015 Programme for International Student Assessment (PISA). Estonia is also renowned for its pioneering role in the use of digital technology in public administration and government affairs. Bringing together these two strengths, Estonia has established the Estonian Education Information System (or EHIS), which is a comprehensive database on education-related data from students, teachers as well as educational institutions, study materials and curricula. While other countries also collect data on some of these aspects, the added value of EHIS is to bring together these different data sources into one comprehensive information system. Furthermore, the system can be used and accessed by different stakeholders – students, teachers and educational institutions. It also helps governmental authorities monitor the performance of the system as the system is integrated into the accountability and monitoring framework for education in Estonia.

The Danish DREAM system

In Denmark, the DREAM project group acts as an "independent semi-governmental institution" to produce a set of simulation and projection models for different spheres of the economy, from population demographics via education to the labour market. Making use of the extremely rich data sources available in Denmark, in particular, the Danish registry data on the whole population, these models provide robust estimations regarding the most important development trends in the Danish economy. The microsimulation model SMILE (simulation model for individual lifecycle evaluation) is part of a set of models in the DREAM system. It draws on data from seven different data sources made available through Statistics Denmark, which allows for robust and precise estimates on the trajectories of individual life courses, in particular, educational and employment decisions.

Being able to model these kinds of decisions early on enables policy makers to identify emerging skills shortages, in particular across sectors of the economy or regions of the country. It also helps policy makers design governance and financing frameworks in such as a way as to ensure that educational institutions provide the skills needed in the labour market. Lastly, the DREAM models alert researchers to emerging inequalities in educational and employment trajectories, which can be mitigated with focused policy responses.

Source: e-estonia (2019[30]), "Estonian Education Information System", https://e-estonia.com/solutions/education/estonian-education-information-system/; DREAM (2019[31]), "The Danish Institute for Economic Modelling and Forecasting, DREAM", http://www.dreammodel.dk/default_en.html.

Policy recommendations for building integrated information systems

In light of the findings and practices above, the following policy recommendations can help countries build integrated information systems (Box 6.15).

Box 6.15. Policy recommendations: Building integrated information systems

- **Mobilise data**. The first step to building an integrated information system is to generate and collect all the relevant information on skills, labour markets and learning data. Due to the multiplicity of sources, this task is complex. The information is generally spread across multiple state bodies and stakeholders; therefore, mobilising data and information can be difficult, slow and costly. Governmental efforts should be aligned towards establishing longitudinal data systems covering early childhood services, primary and secondary education, post-secondary education as well as workforce programmes and social services. The great challenge is to be able to match data from different programmes and to ensure that disadvantaged populations are well-represented. Furthermore, ideally, efforts to collect data on skills policies should be harmonised across countries in order to allow for cross-country comparisons. This is crucial in order to better understand how political and institutional contexts shape the dynamic of skills formation systems.
- **Improve data processing and information dissemination and tailoring**. Data per se is worth little. Moving from data to information requires knowing who the end-users are, their needs, and what the existing information gaps are. It also requires administrative and research capacities to analyse the wealth of data. At this stage, working in close collaboration with end-users is critical. Policy makers, researchers, employers, workers, students and their families have different information needs. Hence, data, as well as research findings based on these data, should be presented in such a way that users can easily and effectively use it to improve the educational and employment decisions they face. A user-centred approach is needed in order to turn data into actionable information as well as to justify and legitimise the large-scale data collection efforts in the first place.
- **Enhance management and evaluation processes**. There is a need for a specific formal or informal institution or body that supports the functioning of the information system. Information systems are dynamic by definition. For example, users' needs change, new data sources become available, new security protocols need to be adopted, and new data-sharing agreements need to be signed with external entities. Also, the performance and efficacy of the system need to be constantly monitored. The overseeing body should preferably include representatives from educational institutions, business and industry as well as workers and unions. This is not only needed to ensure a multi-sectoral approach but also to build trust among stakeholders and users. In this way, building information systems can complement and mutually support government efforts to engage stakeholders (see above). The body should have specific protocols or rules to define and allocate authority, define and execute procedures. Moreover, appropriate funding is needed in order to ensure proper functioning. Finally, strict security and privacy protocols are needed to avoid data misuse and leakages that could harm the system's reputation.

The challenge: Aligning and co-ordinating financing arrangements

Skills will likely be the main driver of future productivity improvements. Furthermore, facilitating investments in developing the right skills and using them more effectively will undoubtedly help countries achieve sustained and inclusive growth. Getting incentives right is important for encouraging investment in skills as well as for steering those investments in ways that better match skills supply with demand.

The importance of skills investments is heightened in the context of megatrends, such as ageing, digitalisation and globalisation, which will create pressure for countries to rethink the balance of skills investment over the life course, with more emphasis on lifelong learning, which is a domain in which governments have historically had limited leverage. Governments and stakeholders have been talking about the need to promote and further develop opportunities in lifelong learning for a long time, but the actual efforts to follow up have been quite limited. Hence, improving financial incentives for both workers as well as employers to devote more resources to lifelong learning is imperative.

Despite the importance of skills, investments in skills are at risk of being crowded out by other, more short-term oriented demands on public spending. Furthermore, a strong institutional capacity is necessary in order to collect, allocate and use financial resources effectively, and to ultimately realise the expected benefits. Therefore, a co-ordinated and coherent approach to financing skills is a key policy area supporting the governance of skills systems.

Governments need to ensure that skills systems are equipped with strong governance arrangement to facilitate the financing of skills policies. However, putting in place an effective and efficient financing arrangement is difficult. The main challenges are:

- **Diversifying sources of funding**. Promoting the development and use of skills, especially in the context of lifelong learning is costly and may require that the costs and benefits of skills investments are more equitably shared between governments, individuals and the private sector (OECD, 2017[32]). – with country-specific differences in how exactly this balance is achieved. In a context of increasing pressure on state budgets, financial arrangements will increasingly rely upon more flexible cost-sharing mechanisms that facilitate integration with resources from private households and employers on the one hand and public budgets both at the central and at the sub-central level on the other. Investments in human capital create both public (societal) and private individual benefits (in terms of higher wages and/or increased productivity); hence a sharing of costs between public and private actors is justified to some extent, although politically contentious in many cases as it involves redistributive trade-offs between the different groups of stakeholders. Finding the right mix of public versus private funding requires an assessment of the benefit to each party as well as co-ordination efforts to align the incentives of public and private actors. Furthermore, the relative mix between public and private sources of funding might vary across sectors. For instance, investing in early childhood education and care could be recognised as a public good as it is deemed to be particularly effective in mitigating educational inequalities in the early stages of the lifecycle. On the other hand, investments in skill formation at higher levels (post-secondary and higher education as well as lifelong learning) are usually associated with concrete and immediate pay-offs in the labour market and could, therefore, justify a larger involvement of private actors (households and employers).

- **Finding appropriate resource allocation and budgeting mechanisms**. Public funds ought to be allocated carefully to promote better policy outcomes. However, prioritisation and budgeting procedures can be complex. Sound mechanisms to prioritise skills investments and allocate public funds to execute them need to be responsive to a country's skills needs; should assess the cost and benefits of such investments; and generate trust among individuals and stakeholders. Optimal investment of resources often involves reallocation of funds that have a limited impact; when this implies the transfer of funds between ministries or the elimination of policies, although inefficient, may be popular or benefit certain stakeholders, political costs and conflicts of interest will arise. Public budgets should also be aligned with multi-year planning, prioritisation and goal-setting functions of the government. The processes in place should ensure that the systems meet these objectives in a sustainable manner. In this regard, it is crucial to ensure that governments' commitments to adequate levels of investments in education and skills are protected against short-term pressures from other policy areas.
- **Ensuring equity in funding considerations**. Government spending on skills investments is justified by the externalities that arise when the population reaches higher levels of skills. As mentioned above, finding the right mix of public versus private funding requires an assessment of those potential benefits and a co-ordination effort to align the incentives of public and private actors so that country-specific balances in cost-sharing are widely recognised as fair, and not preventing individuals from pursuing educational goals. These assessments include equity considerations, which require skills investments to be fairly distributed among the population. Urgent needs, such as adult upskilling or reskilling policies, or remedial interventions targeting disadvantaged populations, can be justified not only on the grounds of efficiency from future benefits but also on the grounds of equity. Market-based systems often fail to provide solutions that are considered fair. In such cases, equity calls for governments to finance skills policies to address this issue, such as ensuring equitable access to skills development opportunities for all, and designing mechanisms to distribute the benefits of human capital formation across the population. Distributing resources on the basis of need may require hard political choices as it might entail the redistribution of resources from privileged to underprivileged regions and educational institutions. Co-ordinating and justifying these efforts with a sound strategy of evidence-based or at least evidence-informed policy making should help to assuage these conflicts (see the discussion above).
- **Providing commensurate resources**. Evidence collected in the OECD National Skills Strategy Projects and other OECD assessments shows that there is often an imbalance between policy responsibilities and resource allocation. This may cause, in turn, a disconnection between policy design and policy implementation. Typically, responsibilities are scattered over many different ministries, bodies or agencies, operating at different levels and with different organisation cultures (Rees, Penny and Hall, 2008[33]). Also, some responsibilities are delegated to agents in the private sector, such as NGOs, or to hybrid bodies or organisations, such as public-private partnerships (PPPs). In this complex environment, resources need to be allocated in such a way that responsibilities are matched with funding so that those with responsibilities have the capacity and funding to operate at the desired standard of service.

Good practices

Skills policies traverse sophisticated financial environments, and finding optimal financial arrangements to promote the acquisition and efficient use of skills is complex. Skills can be acquired through different means, at different costs, and at all stages of life; returns to skills investments are highly heterogeneous and are difficult to predict and measure; and a number of market failures, such as asymmetries of information and credit constraints, surround the processes of skills development and use. These complexities, along with the positive externalities associated with higher levels of skills have provided a strong rationale for governments to regulate and steer skills systems, and to find the best financial mechanisms to boost the acquisition of skills and make better use of them in the economy (OECD, 2017[27]).

By setting the right financial incentives, government policies can have a significant effect on the participation of employers as well as students and workers in initial and further education and training. For instance, measures directed at the supply side of skill formation systems could target public subsidies at particular courses or fields of study or make subsidies contingent on educational institutions meeting particular performance goals regarding labour market outcomes. On the other hand, measures directed at the demand side of skill formation encompass, for example, subsidies to students, workers or the unemployed as well as individual firms.

Some countries provide examples of well-developed governance systems that help to ensure that skills financing is aligned and co-ordinated. For instance, in order to boost the demand for specific skills in the economy, Ireland's Skillnet programme (Box 6.16) creates networks of employers who fund training through a targeted levy.

Box 6.16. Country practices: Creating networks of employers who fund training

The Skillnet training networks in **Ireland** are groups of private businesses in the same sector and/or region that have come together to carry out training-related activities that may not be possible if each firm were to act on its own.

There are currently 65 Skillnet training networks active in Ireland. These are all funded through a mixture of government funding and the National Training Fund (NTF), which is financed through a levy on employers of 0.9% of reckonable earnings of employees in certain employment classes. The NTF levy was introduced with a rate of 0.7% in the year 2000. Because the scheme was introduced simultaneously with a 0.7% reduction in employer social security contributions, it encountered little resistance from employers (although it also means that awareness of the direct contribution to the NTF is relatively low) (Marsden and Dickinson, 2013[34]).

An example of such a network is Wind Skillnet, which has carried out extensive training needs analysis with its member companies, working closely together with the Irish Wind Energy Association and taking guidance from leaders in the Irish wind industry. Wind Skillnet has developed a suite of courses that meet the requirements of trainees in the wind industry. The courses cover a range of topics including turbine operation, maintenance and productivity, finance, planning, grid connection and wind monitoring.

A survey of employers suggested that half the training undertaken through the Skillnets would probably not have been undertaken in the absence of the programme and that the vast majority of employers would not have found training of similar quality (Frontline,

2015[35]). According to Marsden and Dickinson, one of the greatest advantages of the Skillnets model is that it reduces the administrative costs of training, which is particularly helpful for SMEs. Skillnets are also tasked by the government to target training "towards areas suggested as appropriate by government policy and the ongoing evidence-based analysis by Forfas and the Expert Group on Future Skills Needs" (Frontline, 2015[35]).

Source: OECD (2017[27]), *Financial Incentives for Steering Education and Training*, Getting Skills Right, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264272415-en; Skillnet Ireland (2018[36]), "Skillnet Ireland – Home", http://www.skillnets.ie; https://www.iwea.com/learning-hub/green-tech-skillnet.

As a further example, the Swedish model of Higher Vocational Education (Box 6.17) is structured to tie funding closely to employer demand throughout the process of programme development, helping to ensure labour market relevance and a return on skills investment.

Box 6.17. Country practices: Tying funding closely to skills needed by employers

The aim of the **Swedish** model of Higher Vocational Education (HVE) is to provide a form of education that develops the highly skilled professionals most in need in the labour market. Typical HVE programme length is between six months and two years. Completion of a one-year programme results in a Higher Vocational Education Diploma. Completion of a two-year minimum programme results in an Advanced Higher Vocational Education Diploma.

Employers are the main stakeholders in this model, and their involvement is four-pronged. First, employers work together with providers to translate specific skills needs into a programme proposal. Second, they back the funding application that the training institutions submit to government (to the Swedish National Agency for Higher Vocational Education): no funding can be obtained without clear proof of employer demand. Third, once the programme is approved, each provider has to set up a steering committee for the programme, including representatives from employers and industry. This steering committee is responsible for the implementation of the programme, including admissions, the syllabus and quality assurance. Finally, nearly all programmes (except those of very short duration) contain a workplace learning component (Lärande i Arbete, LIA), which is seen as one of the main success factors behind the Swedish model of Higher Vocational Education.

The providers of Higher Vocational Education are autonomous in the sense that they decide which applications for courses to submit – although they need to abide by the rules set by the national agency. In practice, a wide range of organisations can provide HVE programmes, including higher education institutions, municipalities, county councils and private providers. There are no requirements for staff to have formal teaching qualifications, which allow practitioners to teach. The teacher must, however, possess good or very good knowledge and experience in their given field.

Source: Tomaszewski, R. (2012[37]) , "The Swedish Model of Higher Vocational Education"; OECD (2017[27]), *Financial Incentives for Steering Education and Training, Getting Skills Right*, , http://dx.doi.org/10.1787/9789264272415-en.

The model of dual apprenticeship training in countries such as Austria, Germany and Switzerland also aligns financial incentives for youth and employers to participate in training that responds to the needs of the economy (Box 6.18).

Box 6.18. Country practices: Aligning financial incentives in dual apprenticeship training

Vocational education and training, according to the dual apprenticeship training model, combines practical training in a workplace setting with theoretical education in vocational schools or colleges. Dual apprenticeship training is particularly common and institutionally well developed in the collective skills formation systems (Busemeyer and Trampusch, 2012[38]) of continental **European countries** such as Austria, Denmark, Germany, the Netherlands and Switzerland, and its popularity is increasing in other countries such as Ireland, Norway and the United States. Countries differ with regard to the exact distribution of training costs among employers, individuals (households) and the state. Broadly speaking, the dual apprenticeship training model implies that some training costs are shouldered by employers themselves, who pay wages to apprentices during their training period. In this regard, the dual apprenticeship model in the collective skills formation system is different from apprenticeship training provided by external providers, as is common, for instance, in Australia and the United Kingdom.

This has important implications regarding the alignment of financial incentives. In employer-provided training, employers have a strong incentive to invest in skills that they themselves require of their future workforce. In provider-provided training, in contrast, external providers ideally have such an incentive as well, but their financial incentives might be different as providers specialise in training popular with apprentices (but not necessarily needed by employers) or government agencies doling out subsidies. Hence, financial incentives for employer-provided skill investments are better aligned in training arrangements where employers themselves provide and pay for training rather than external providers.

The state supports firm-based training in dual apprenticeship training models by investing in vocational schools or vocational colleges. Labour market actors – employers and unions – have a strong influence on the process of reforming and updating existing occupational profiles (see above, Box 6.8). State actors largely follow these priorities by setting up and paying for theoretical education in schools. Furthermore, more recently, the model of dual training is increasingly spreading to the higher education sector (Graf, 2018[39]). As a consequence, vocational colleges and other institutions in tertiary VET are expanding, some of which are publicly funded, others privately funded, depending on the country and regional context. As employers are involved in the selection of students at these institutions, the financial incentives of educational institutions and employers are well-aligned in these cases as well since there is a direct connection between the supply of skills via the education system and demand from labour market actors.

Lastly, the cost-sharing arrangements in dual apprenticeship training also involve a contribution from private households and individuals. On the one hand, individual apprentices receive a wage during their training period, but, on the other, the wage level typically remains significantly below the level of a skilled worker. Since occupational labour markets for skilled workers are well regulated in countries with a strong tradition in apprenticeship training, there is a strong financial incentive for apprentices to stay committed to their training and to graduate in order to become a certified skilled worker. For employers, keeping apprentice wages at a comparatively low level increases the incentives to participate in apprenticeship training. Since the productivity of apprentices comes close to the level of skilled workers during the later stages of training, employers can (partly) recoup their training expenses this way. Again, the financial incentives of employers and apprentices are well aligned.

Source: Busemeyer, M.R. and C. Trampusch (2012[38]), *The Political Economy of Collective Skill Formation,* https://global.oup.com/academic/product/the-political-economy-of-collective-skill-formation-9780199599431?cc=fr&lang=en&#, Graf (2018[39]), "Combined modes of gradual change: The case of academic upgrading and declining collectivism in German skill formation", http://dx.doi.org/10.1093/ser/mww044.

The Korean system of higher education financing provides another illustrative example (Box 6.19). Faced with a strong increase in student numbers, which led to an over-supply of university graduates in the labour market, the Korean government has reformed the system of financial incentives for the higher education sector. Universities that perform well in a comprehensive evaluation based on qualitative and quantitative information are allowed to maintain and accept a higher number of students, whereas poorly performing universities are obliged to cut student quota. This sets strong incentives for universities to perform well.

Box 6.19. Country practices: Reforming higher education governance and finance

In the wake of its transition to democracy, **Korea** has seen a strong increase in its number of higher-education students since the 1990s. Even though this educational expansion has contributed to and fueled Korea's economic development, the over-supply of higher education graduates increasingly leads to skill mismatches in the labour market. Furthermore, the expansion of tertiary education has been accompanied by a steep increase in tuition fees, raising equity concerns.

As a consequence, the Korean government has passed a number of reforms aimed at slowing down the pace of educational expansion, while at the same time aligning financial incentives in order to improve the overall quality of the system. The comprehensive "University Structural Reform Plan" (2015) aims to reduce the admission quota for universities in order to mitigate the problem of over-supply of higher education graduates. However, the admission quota reduction goals affect universities to different degrees, depending on the results of an evaluation process, which includes both quantitative as well as qualitative information. The university evaluation proceeds in three stages, i.e. it is not focused on performance in the short term, but rather aims at a medium- to long-term assessment. The catalogue of evaluation criteria includes a range of issues such as the educational environment, academic management, student support and educational outcomes. Regarding the latter, the evaluation includes criteria that measure employment outcomes of graduates of a particular institution, establishing a direct connection between the education system and the labour market.

As a general rule, universities that receive a more positive evaluation are less pressured to reduce student quotas.

Source: Byun, H. (2018[40]), *The Evaluation of Higher Education Restructuring in Korea: Problems and Suggestions for Improvement*, http://www.cshe.nagoya-u.ac.jp/publications/journal/no18/12.pdf; OECD (2009[41]), *OECD Reviews of Tertiary Education: Korea 2009*, https://doi.org/10.1787/9789264049055-en.

As mentioned earlier, it is crucial to ensure that governments' commitments to adequate levels of investments in educational and skills are protected against short-term pressures from other policy areas. Box 6.20 illustrates Chile's main mechanism for school financing, which provides additional funding to schools serving vulnerable students and sets transparent and predictable funding rules for school providers.

Box 6.20. Country practices: Formula-driven school grants

In **Chile**, the main mechanism of public financing is in the form of school grants from the state to school providers (municipalities, for instance), who directly manage the funds. The basic school grant (Subvención de Escolaridad) results from multiplying a basic amount updated yearly by the monthly average student attendance and an adjustment factor by level and type of education. The basic grant is complemented by a range of more specific allowances and grants to acknowledge that the cost of providing quality education varies depending on the characteristics and needs of students and schools. For instance, the Preferential School Subsidy aims to level the differential cost incurred by schools tending to vulnerable students. Complementary financial transfers include allowances directly given to education staff.

Chile's system of formula-driven school grants provides a transparent and predictable basis for school providers. Unlike many other countries around the world, school financing is based on objective criteria (number of students being the most important one, but with adjustments for other factors affecting schools' per-student costs), and not the result of negotiations between the government and public and private school providers. The existence of a clearly defined and objectively measured formula as the basis for allocating resource imposes a hard budget constraint on providers and creates the conditions for basic spending discipline, an important feature in a system with many school providers. The formula also accommodates the needs of a diverse network of service providers. Finally, resource allocation is not inertial and responds to new policy priorities: when a new policy requires additional resources, the budget changes accordingly.

Source: OECD ((2017[42]), "Funding of School education in Chile", in *OECD Reviews of School Resources: Chile 2017,* https://doi.org/10.1787/9789264285637-6-en.

Policy recommendations for aligning and co-ordinating financing arrangements

In light of the findings and practices above, the following policy recommendations can help countries align and co-ordinate financing arrangements (Box 6.21).

Box 6.21. Policy recommendations: Aligning and co-ordinating financing arrangements

- **Mobilise and diversify resources**. Transforming traditional front-loaded education systems into lifelong learning systems is likely to require increasing the amount of resources available for education and training at all life stages. This might require diversifying the sources of funding from public to mixed public-private arrangements. Different countries will pursue and achieve different balances in funding between public and private sources. Effective and equitable skills policies reflect these country-specific differences while also minimising the risk that unequal distributions in financing responsibilities effectively prevents disadvantaged groups from pursuing their skills goals. Reducing the barriers for non-state skills investments is critical to encourage participation in training, to mobilise the commitment of employers to skill formation and to boost investments in education and training. Governments should use financial

incentives to steer skills investments more broadly (OECD, 2017[27]), and explore co-financing partnerships with the private sector, such as public-private partnerships or tri-sector partnerships. Countries with well-established dual apprenticeship systems are examples of such cost-sharing arrangements, where the public sector pays for the acquisition of cognitive skills in education in vocational schools, and firms pay for on-the-job training.

- **Assess financial needs and identify priorities**. A first step in prioritising skills investments and expenditures is to assess the financing gaps in the system. Once gaps are identified, an investment strategy ought to be defined in line with the medium-term strategic priorities of government. Above and beyond defining abstract long-term goals, these strategies should define short-term intermediary goals that help to shore up commitment among policy makers to follow through with long-term plans. Policies for financing skills development and use should be evaluated on the basis of two criteria: efficiency and equity. Efficiency requires a comprehensive assessment of the costs (including opportunity costs) and benefits of skills investments. Financial efforts should be directed towards investments with higher expected rates of returns. But efficiency also requires finding the optimal cost-sharing mechanisms to finance skills investments. Some skills investments may be efficient without being fair. Others can be fair without being efficient. A sound strategy and prioritisation exercise should balance equity and efficiency of skills investments and should prioritise spending on marginalised groups and on investments with the highest return. Countries will differ with regard to how exactly the balance between efficiency and equity is achieved. Promoting efficiency in the allocation of fiscal resources does not aim to identify a one-size-fits-all approach to skills policy, but rather to achieve the best results given a certain level of fiscal resources and country-specific policy goals. Such an approach could identify whether certain types of spending (i.e. on teacher or star faculty salaries) indeed pay off in terms of higher levels of educational performance.
- **Match funding with needs**. Allocating resources so that responsibilities are matched with funding requires a clear view of who does what in the skills system and what roles and functions are adequately covered and what are not. Identifying financing gaps allows governments to assess areas or functions that are under- or over-funded. A top priority should be to secure the finance needed to provide essential education and training services. Further efforts should be allocated in implementing sound monitoring and evaluation systems, which in addition to boosting transparency and accountability facilitate the provision of commensurate resources to the agents in the system.

Note

[1] The notion of policy complementarities goes beyond that of coherence and refers to the mutually reinforcing impact of different actions on a given policy outcome. Policies can be complementary because they support the achievement of a given target from different angles. Policy complementarities should also promote the most efficient allocation of resources, taking into account best practice technology (Aziz and Wescott, 1997[43]).

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Annex A. OECD Skills Strategy Dashboard

This annex concerns the OECD Skills Strategy Dashboard. The objective of this dashboard is to present an overview of the performance of the skills system in OECD Member countries. By presenting the relative position of countries on key skills outcomes, the dashboard provides a general overview of countries' skills systems' strengths and weaknesses. The dashboard is the starting point for analysis in OECD Skills Strategy projects. This annex describes the characteristics, presents the indicators and describes the underlying methods for calculating indicators.

Characteristics

The dashboard is the result of internal consultation and analysis of core indicators used in the National Skills Strategy Projects. It presents a simple, intuitive overview of the outcomes of skills systems that is easy to interpret and which provides a quick impression of a country's skills performance across the pillars of the OECD Skills Strategy ("developing relevant skills" and "putting skills to effective use"). The dashboard applies a broad definition of skills by presenting foundational skills, problem-solving skills and broadness of skill sets, and considers both economic and social outcomes. A total of 38 key outcome indicators were selected and grouped into 18 aggregated indicators (see the full list in Table A.1). For the OECD Skills Strategy 2019 update, all OECD Member countries are included in the dashboard. However, given that the majority of indicators are based on PIAAC, there are various gaps for countries that did not participate in this survey, and for some countries, only regions are included, including Flanders for Belgium, and England and Northern Ireland for the United Kingdom.

Indicator selection

The selection of indicators followed a process whereby a long-list of the most commonly used indicators in NSS reports was gradually reduced to a short-list of core indicators. This process built on the principle that the indicators describe the core outcomes of the different pillars of the skills system. In addition, these indicators express outcomes in terms of level, trend, distribution and equity. They are comparatively easy to interpret and based on OECD sources, with the most recent data.

Method for calculation of aggregate indicators

To develop aggregate indicators that represent the relative position of countries on key outcomes of the skills system, a number of calculations were made on the collected data. To describe the relative position across countries, a score for each indicator was calculated ranging from zero to ten, with zero for the weakest performance and ten for the strongest performance in the list. This resulted in an indicator that allows for comparisons between different types of indicators (e.g. averaging performance of literacy scores and educational attainment rates). The resulting scores were normalised in such a way that better performance results in a higher score. Subsequently, an unweighted average of the indicators was calculated for each of the aggregates, and these scores were then ranked. The final ranking was separated into five groups of equal size, ranging from "Top 20% performer" to "Bottom 20% performer".

Table A.1. OECD Skills Strategy Dashboard: Pillars, aggregates and underlying indicators

Pillar and aggregates	Indicator
Developing relevant skills	
How skilled are youth?	Reading (PISA[1]), mean score, 2015
	Mathematics (PISA[1]), mean score, 2015
	Science (PISA[1]), mean score, 2015
Are the skills of youth improving?	PISA[1] average 3-year trend (reading, mathematics, science)[2]
Are the skills of youth being developed inclusively?	PISA[1] ESCS parity index, science performance, 2015
How many young adults attain tertiary education?	Tertiary education attainment rate, 25-34 year-olds, 2017
How skilled are young tertiary-educated adults?	Literacy (PIAAC[3]), mean score, tertiary educated 25-34 year-olds, 2012/15
	Numeracy (PIAAC[3]), mean score, tertiary educated 25-34 year-olds, 2012/15
	Problem solving (PIAAC[3]), % Level 2/3, tertiary educated 25-34 year-olds, 2012/15
How inclusive is tertiary education?	Share tertiary educated with both parents less than tertiary, 2012/15
How strong are foundational skills of adults?	Literacy (PIAAC[3]), mean score, 2012/15
	Numeracy (PIAAC[3]), mean score, 2012/15
	Problem solving (PIAAC[3]), % Level 2/3, 2012/15
Do adults have a broad set of skills?	Percentage of adults with a broad set of skills (PIAAC[3]) (Level 3-5 in literacy and numeracy and Level 2/3 in problem solving), 2012/15
Is there a strong culture of adult education?	Formal and/or non-formal adult education participation rate (PIAAC[3]), last 12 months, 2012/15
	Willing to participate in adult education (PIAAC[3]), percentage of the population, 2012/15
	Barriers to participation (PIAAC[3]),percentage of people wanting to participate who didn't, 2012/15
Are the skills of adults being developed inclusively?	High-low educated parents, adjusted literacy difference (PIAAC[3]), 2012/15
Putting skills to effective use	
How well are skills activated in the labour market?	Employment rate, working age, 2017
	Labour force participation rate, 2017
	Youth not in employment, education or training (NEET), percentage of 15-24 year-olds, 2017
How inclusive is the labour market?	Gender (male-female), employment rate difference, 2017
	High-low educated, employment rate difference, 2017
How well aligned are skills with the labour market?	Variation across occupations in Occupational Shortage index indicators, 2015/17[4] (*Skills for Jobs* database)
Do workplaces make intensive use of skills?	Reading at work (PIAAC[3]), score, 2012/15
	Numeracy at work (PIAAC[3]), score, 2012/15
	Information and communication technology (ICT) at work (PIAAC[3]), score, 2012/15
Do people use their skills intensively in daily life?	Reading at home (PIAAC[3]), score, 2012/15
	Numeracy at home (PIAAC[3]), score, 2012/15
	ICT at home (PIAAC[3]), score, 2012/15
Is the use of skills at work improving?	Reading skills use at work adjusted difference young (16-25) – prime age (26-54) (PIAAC[3]), 2012/15
	Numeracy skills use at work adjusted difference young (16-25) – prime age (26-54) (PIAAC[3]), 2012/15
	ICT skills use at work adjusted difference young (16-25) – prime age (26-54) (PIAAC[3]), 2012/15
Are firms designing workplaces to use skills effectively?	High-performance workplace practices, percentage of jobs, 2012/15 (PIAAC[3])
Is skills use stimulated by innovation?	Researchers, per 1 000 employed, 2016
	Triadic patent families, performance index (STI[5] Outlook), 2016
	International co-authorship, performance index (STI[5] Outlook), 2016
	International co-invention, performance index (STI[5] Outlook), 2016

1. Programme for International Student Assessment (PISA).
2. The average trend is reported for the longest available period since PISA 2006 for science, PISA 2009 for reading, and PISA 2003 for mathematics.
3. Survey of Adult Skills (PIAAC).
4. See https://www.oecdskillsforjobsdatabase.org for methodology.
5. Science, Technology and Innovation (STI).

Note: Indicators without a specific source between brackets are OECD indicators from OECD Data (https://data.oecd.org/home/).

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