

Key Issues Paper

**Re-building an inclusive and
equitable society through education**

**OECD Education and Skills Ministerial
07-08 December 2022**



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OECD Education and Skills Ministerial, 7-8 December 2022



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This Key Issues Paper provides background to inform the discussions at the Meeting of the Education Policy Committee at the Ministerial Level held at the OECD in Paris during 7-8 December 2022. A companion document provides a summary of this Key Issues Paper and proposes questions for discussion among Ministers.

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Session 1: Plenary Opening

Theme: Ensuring resilient and equitable education systems build the foundations of inclusive and equitable societies

Education and skills promote economic growth and are a key determinant of social cohesion. There is evidence that education and skills have the potential to build strong foundations for cohesive democratic societies and to contribute to sustainable and inclusive economic and social development. Importantly, achieving equity within education and skills systems is key to promoting equity in subsequent lifetime outcomes and social mobility, nurturing more inclusive and equitable societies. At the same time, high-quality education builds individuals' and societies' resilience to adapt to change and respond creatively to disruptions such as the COVID-19 pandemic, to address challenges such as climate change, and to make the most of opportunities such as the digital transformation. This requires education and skills systems to enable people, throughout their lives, to develop the knowledge, skills, attitudes and values they need to become responsible and engaged citizens. This must be achieved alongside other economic and social policies, informed by high-quality educational research and in partnership with relevant stakeholders and communities.

Key Issues

The knowledge, skills, attitudes and values that education and skills systems should enable

Increasingly skills-intensive economies and fast-evolving societies are putting greater pressure on education and skills systems to enable all people to develop the knowledge, skills, attitudes and values that will help them live in a world of constant change, sudden disruptions and crises, as they prosper and shape their future in sustainable and inclusive societies. As people will increasingly need to apply their competencies in unknown and evolving circumstances, they will need both a wider array of knowledge (disciplinary, interdisciplinary, epistemic, procedural) and a broader range of skills to live with others and with the planet, including cognitive and meta-cognitive skills; social and emotional skills; and practical and physical skills, mediated by attitudes and values (OECD, 2019^[1]). Knowledge and skills are both interconnected and mutually reinforcing while disciplinary knowledge, or subject-matter knowledge, in particular, remains an essential foundation for understanding, and a structure through which students can develop other types of knowledge (OECD, 2019^[2]), making it essential for equity in learning. Enabling people to acquire such knowledge, skills, attitudes and values requires learning environments – in and out of educational institutions, and across the lifecycle – that acknowledge a whole-child/person perspective, i.e. prioritise the full scope of an individual's developmental needs as a way to advance educational equity and ensure every individual reaches their full potential (OECD, 2019^[1]).

As put forward by the OECD Learning Compass 2030, in order to navigate complexity and uncertainty, and be able to help shape a better future and influence the world around them, learners can rely on transformative competencies (e.g. creating new value, reconciling tensions and dilemmas, taking responsibility) to enable them to shape their own perspectives, ensure their individual well-being, and

contribute to collective well-being (OECD, 2020^[3]). Individuals' ability to adapt and thrive in a fast-evolving world rests on education and skills systems enabling them to acquire strong foundational knowledge and skills; willingness to learn and a habit of learning; the capacity to transform ideas into sustainable actions, including products and services, by acting entrepreneurially; and adaptability to changing labour market needs, i.e. on policy making and policy makers using the policy tools at their disposal to facilitate such outcome. This requires systemic changes so that structural barriers – at national, regional or local levels – do not stand in the way of individual and collective action. This is supported by high-quality early childhood education and care that enables all young children to develop the skills and learning habits that help them thrive throughout their lives; and lifelong learning opportunities to absorb and expand the knowledge and skills required to navigate new labour-market needs and life circumstances. Skills identified as particularly important to benefit from lifelong learning are 'motivation for learning', 'learning to learn' or 'self-directed learning' (OECD, 2021^[4]).

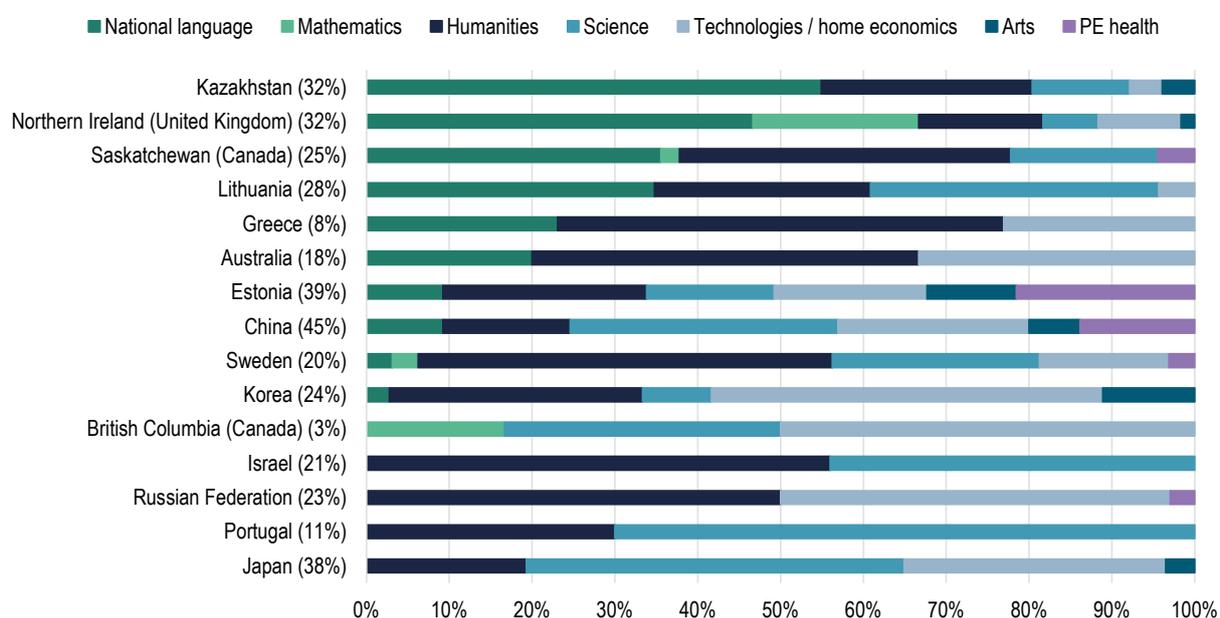
This shift presents a number of policy challenges, including the design of learning environments, stakeholders' buy-in, and capacity at learner, educator and policy maker levels. Some countries are responding to these challenges by, for example, increasingly articulating the importance of attitudes and values explicitly into learning objectives; further emphasising physical and emotional well-being, sustainable living, and active citizenship; facilitating learning in different stages of life; providing greater opportunities for learners to interact with the workplace (as in the case of vocational education and training); offering access to incubation and acceleration programmes to learners who aim to create a venture reflecting their skills and knowledge; or seeking to evolve assessment and certification approaches to match the whole child/person perspective on learning (OECD, 2021^[5]). For example, in 2016, the ministers of Canada's educational jurisdictions articulated six broad global competencies in the Pan-Canadian Systems-Level Framework on Global Competencies: Critical thinking and problem solving; Innovation, creativity, and entrepreneurship; Learning to learn and to be self-aware and self-directed; Collaboration; Communication; and Global citizenship and sustainability. Building on strong foundations of numeracy and literacy, this non-prescriptive reference framework is a pan-Canadian effort to prepare students for a complex and unpredictable future with rapidly changing political, social, economic, technological, and ecological landscapes. These competencies are an overarching set of attitudes, skills, knowledge, and values that are interdependent, interdisciplinary, and leveraged in a variety of situations both locally and globally. In Norway, in 2020, health and life skills became one of three interdisciplinary topics of its core curriculum for primary and secondary education. This change aims to help students gain the competencies they need to make responsible life choices, to deal with success and failure, and to achieve physical and mental well-being (OECD, 2021^[6]). In 2022, as part of its 4K model (in a pilot phase), Lithuania increased focus on 21st century competencies such as social and emotional skills, healthy lifestyle, citizenship, culture, creativity and communication through activities which supplement the regular curriculum. The model recommends students to take part in 60 hours of non-formal learning activities per school year based on the four "Ks" (which translate as "I create, I change, I am with others, I am for others"), including volunteering, sports, personal development, social activities or all of these combined. In Greece, as of 2020, Skills Labs modules aim to develop students' soft skills, life skills, and digital skills using innovative methods, with an emphasis on experiential learning. Teachers and school leaders work collaboratively to design a skills programme based on four thematic cycles: well-being; environment; social empathy and accountability; and creative thinking and innovation. An online platform brings together differentiated teaching resources and suggested activities, assessment material, and information for parents. The programme seeks to develop social and emotional skills – such as empathy, adaptability, and planning – that support the resilience of learners (OECD, 2021^[6]). In Poland, the Competency Development Programme aims to develop transversal skills of all students in higher education, through modernised teaching methods, including new technologies, module teaching and interdisciplinary studies (OECD, 2015^[7]).

Anticipating skills needs for a successful digital and green transition in democratic societies

Technological progress is transforming societies, economies and people's lives. The way we learn, work, communicate and consume is being turned upside-down by digitalisation (OECD, 2019^[8]). At the same time, the Intergovernmental Panel on Climate Change indicates that the planet is warming rapidly, and that human activity is responsible for global warming. Tackling the challenges of climate change and reaping and broadly sharing the benefits of the digital and green transformation require decisive action on the part of policy makers and a significant re-thinking of how societies function.

Figure 1. Literacy for sustainable development in curricula

Distribution of content items in the mapped curricula targeting literacy for sustainable development (as main or sub target), by learning area



Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.

Information on statistical data for Israel: <http://dx.doi.org/10.1787/888932315602>.

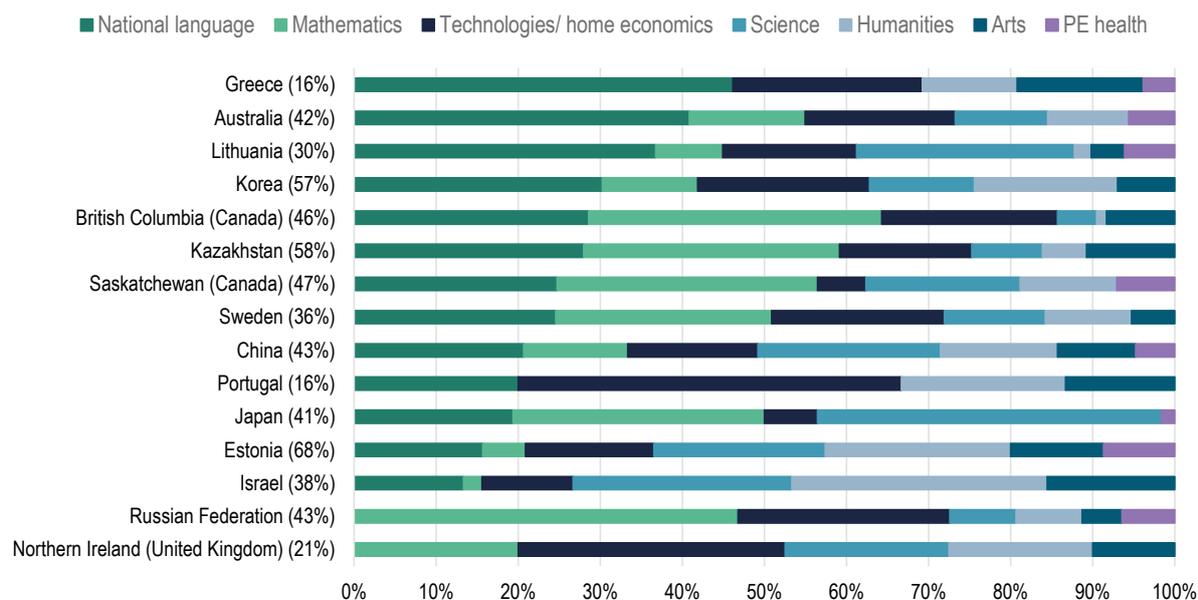
Source: Data from the Education 2030 Curriculum Content Mapping exercise.

This involves education and skills systems ultimately developing the necessary structures and policies, including education and training programmes, to enable future generations acquire the competencies needed to adapt to and mitigate environmental conditions, to adjust to fast-paced technological change and to take decisions to promote fairer, more inclusive and more sustainable growth. As technology progresses, individuals will need relevant opportunities and incentives to expand their digital skills while being increasingly valued in the labour market for tasks that humans can do best. In addition, in order to solve environmental degradation, individuals should benefit from learning structures and support to develop the attitudes and behaviours necessary for a culture of sustainability towards greener societies and economies, and to collaborate with others in finding shared solutions and addressing their distributional consequences. To support a successful digital and green transition, an increasing number of education and skills jurisdictions are embedding such cross-curricular themes or contents and competencies (e.g. environmental literacy, literacy for sustainable development, ICT literacy, digital

literacy, etc.) into the curriculum. Jurisdictions make different choices, however, a common strategy is to avoid creating or adding new subjects to an already crowded curriculum and, instead, connect these themes to relevant subjects and topics, where relevant (see Figure 1 and Figure 2) (OECD, 2020^[9]).

Figure 2. ICT/digital literacy in curricula

Distribution of content items in the mapped curricula targeting ICT/digital literacy (as main or sub target), by learning area



Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.

Information on statistical data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Source: Data from the Education 2030 Curriculum Content Mapping exercise.

An imperative for governmental action and societal engagement in responding to these challenges is working with learners, employers, communities and other stakeholders to anticipate future skills needs in economies and societies that are in constant transformation and labour markets that are in permanent evolution. For example, Hong Kong (China) reviewed the social, scientific, technological and economic changes both at the local and global level, identified future skills needs and renewed its 2017 secondary education curriculum, e.g. strengthened a selected group of subjects such as STEM, IT education, entrepreneurial spirit, and values education (OECD, 2020^[10]).

Resolving debates over the best course of action and building a consensus over policy decisions require strong citizen engagement in the political process and the endorsement of the democratic process. Hence, as our societies become increasingly diverse and often polarised across economic, political, geopolitical and cultural lines, a successful digital and green transition requires policies to enable individuals to strengthen the skills necessary for civic engagement and democratic participation and to interact successfully and respectfully with others. High-quality education matters for democracy and well-functioning institutions. Empirical analyses highlight the strong cross-country correlation between education and democracy, supporting the role of education as a crucial pillar for democracy (Lochner, 2011^[11]; Apergis, 2018^[12]). In addition, the evidence indicates that the distribution of education in a country appears to matter more than the average level of its population's education for the implementation and sustainability of democracy (Castelló-Climent, 2008^[13]). Indeed, greater equity in educational outcomes is

associated with stronger measures of political rights and civil liberties. Education and skills systems instil civic and democratic values in learners, supporting the formation of engaged and well-informed citizens who can better contribute to their communities. Investment in education tends to translate into higher voter engagement (e.g. voter registration, voting), political information (e.g. following campaigns and public affairs) and support for free speech (Lochner, 2011^[11]; Bradley and Green, 2020^[14]). In addition, education and training include learners in social networks, providing opportunities to interact, exchange diverse ideas and engage in collective activities. Education is a key predictor of social capital, including actual social relationships and networks, and norms of trust and reciprocity that facilitate co-operation between individuals (Borgonovi and Andrieu, 2020^[15]; Algan, 2018^[16]). Education can also support the formation of more tolerant and open-minded individuals, and through them of societies that are more cohesive (OECD, 2022^[17]).

Empowering and supporting individuals to learn, unlearn and relearn in changing contexts

Education and skills systems aim to respond to the expectations of a new generation of learners while providing lifelong learning opportunities to a population with greater aspirations and needs for learning. The COVID-19 pandemic highlighted the importance of motivation for learning, initiative and capacity for self-directed learning, and ability to shape own education paths. Today's learners require new concepts (e.g. learner agency), new modes of learner-educator interaction, the recognition of learning settings beyond formal educational institutions and stronger interfaces with society.

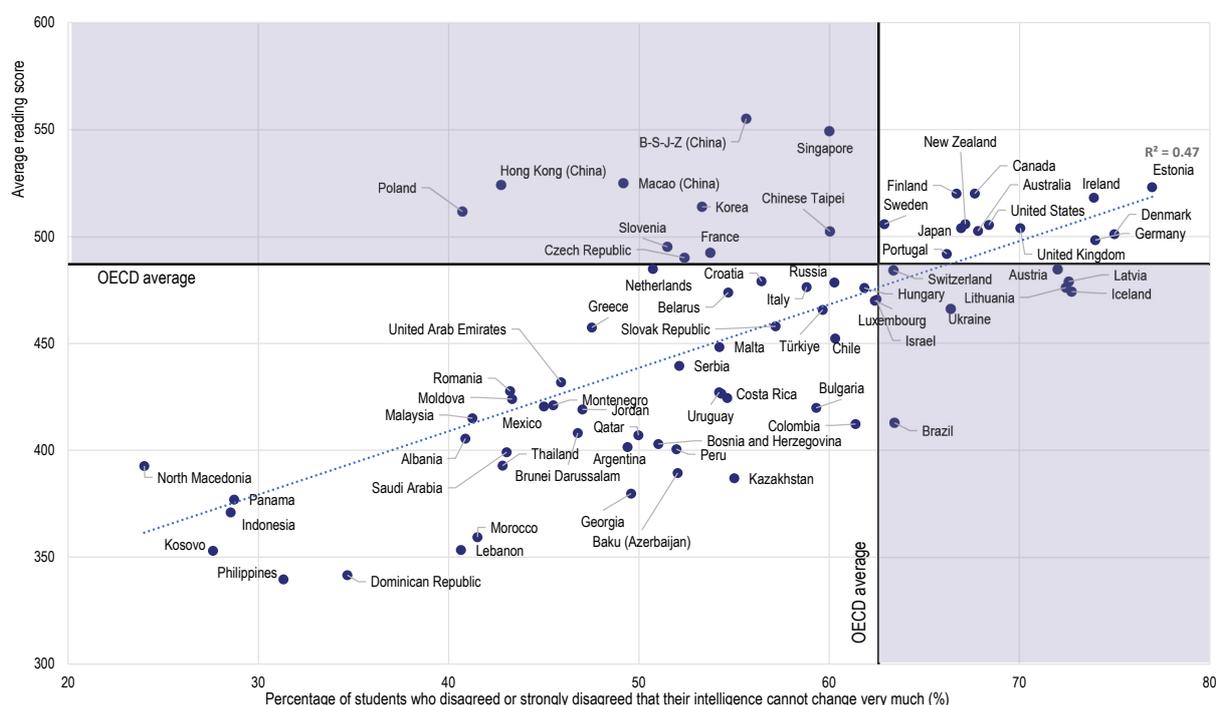
An imperative is placing the learner at the centre of learning systems. When learners are agents in their learning, e.g. playing an active role in deciding what and how they will learn, they tend to show greater motivation to learn and are more likely to make sense of or find a sense of purpose for their own learning (Bron, 2014^[18]). Central to the OECD Learning Compass 2030 are the concepts of student agency and co-agency. Students need to exercise purpose and responsibility in their pursuit of learning and the transition to adulthood. Student agency is defined as the ability, will and beliefs (e.g. growth mindset) to positively influence their own lives and the world around them. It entails having the capacity to set a goal, reflect and act responsibly to effect change. It is about acting rather than being acted upon, shaping rather than being shaped, and making responsible decisions and choices, rather than accepting those determined by others. Instilling a growth mindset – the belief that someone's ability and intelligence can develop over time – in students could result in better academic performance (Figure 3). This may be because students with a belief that they can learn and improve are more motivated, have stronger drive and have better 'learning to learn' skills than other students (OECD, 2020^[3]).

Empowering and supporting individuals to learn, unlearn and relearn in evolving contexts requires education and skills systems to make considerable structural changes through effective educational reforms. To encourage learners to confidently navigate their different environments, education policy makers need to ensure that they enable them to acquire the complex skills and competencies to adapt to various tasks and environments, helping them help themselves to take advantage of learning opportunities to reach their individual potential (OECD, 2020^[3]). Instrumental to this is having teachers, trainers and educators adjust practices to individually empower and support learners. As suggested by the United Nations' Transforming Education Summit, this requires supporting the professional development of teachers and educators to deliver inclusive, learner-centred, gender-transformative pedagogy and ensure adequate planning time and resources. This will support individuals to be adaptable and learn throughout life as they respond to their reskilling and upskilling needs. Countries are taking a variety of approaches such as recognising students' voice in policy making (e.g. Finland collecting students' feedback on the curriculum reform process); forecasting future needs (e.g. Korea researching future skills needs and revising the curriculum); and diversifying learning experiences to promote the future career readiness of diverse learners (e.g. Scotland (United Kingdom) implementing curriculum to support the needs of learners with diverse profiles) (OECD, 2020^[10]). In 2019, Costa Rica established annual national student dialogues,

through which student representatives from across the country meet with representatives from the Ministry of Public Education to discuss issues such as student well-being, national assessment, and dual education (OECD, 2021^[6]). In 2018, Estonia launched regular stakeholders' satisfaction surveys to collect the views of learners, parents and teachers on aspects such as the school environment, student learning, and student well-being. The information is used to inform strategic improvement at the system level (including monitoring progress of Estonia's Lifelong Learning Strategy) and inform school development (schools receive individual reports) (OECD, 2021^[6]).

Figure 3. Growth mindset and student performance

Percentage of students with a growth mindset and average reading performance



Source: (OECD, 2019^[19]), *PISA 2018 Results (Volume III): What School Life Means for Students' Lives*, <https://doi.org/10.1787/acd78851-en>.

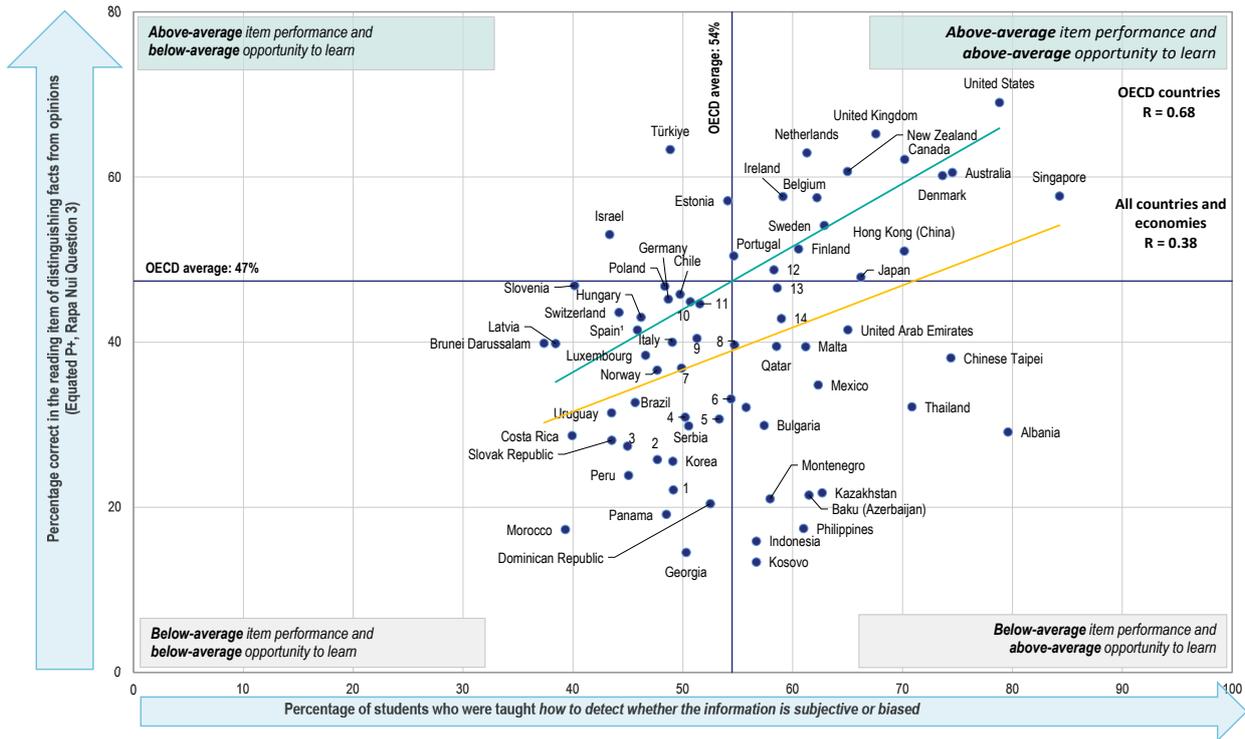
The empowerment and autonomy of learners is best established during the early years. Early childhood education and care should nurture young children's natural curiosity and enjoyment of the processes of learning, as it makes them happier and facilitates their continuing development of a holistic set of skills (OECD, 2020^[20]). By developing strong foundational skills, education and training systems can also build high levels of confidence and motivation to support learners in shaping their learning trajectories and transitions into working life. This benefits from policy action which provides equal opportunities for lifelong learning, incentives to engage in learning throughout life, diverse provision of learning in a variety of settings to respond to the individual needs of all learners, and recognition of learning outside formal education and offered by alternative providers.

Strengthening links between education and other fields of public policy

Many countries have experienced increasing income and wealth inequality in the past decades. Even before the pandemic hit, increases in life expectancy had stalled in some countries, and poor health reduced the quality of life of many individuals worldwide. Geopolitical instability, demographic imbalances,

poverty, and climate change led many to flee their place of birth (OECD, 2021^[21]). Economies have shifted towards regional hubs of production in several sectors, linked together by global chains of information and goods, but concentrated where comparative advantage can be built and renewed. This makes the distribution of knowledge and wealth crucial, and that is intimately tied to the distribution of education opportunities.

Figure 4. Reading item of distinguishing facts from opinions and access to training on how to detect biased information in school



Notes: 1. Numbers in the figure correspond to the following countries: 1. Bosnia and Herzegovina; 2. Malaysia; 3. Colombia; 4. Czech Republic; 5. Belarus; 6. Croatia; 7. France; 8. Lithuania; 9. Greece; 10. Austria; 11. Iceland; 12. Macao (China); 13. B-S-J-Z (China); 14. Russia.

2. In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

Source: OECD (2021^[22]), *21st-Century Readers: Developing Literacy Skills in a Digital World*, <https://dx.doi.org/10.1787/a83d84cb-en>.

Investment in quality education and training that leads to better and more relevant skills pays off for individuals, communities and societies in significant and multiple ways. The expansion in educational opportunities in the past decades was driven by the recognition that higher levels of skills increase productivity and therefore educational investments can promote economic growth but also reduce socio-economic differentials in labour market outcomes and life chances, thus promoting social mobility. This requires flexible labour markets, signalling and incentives that support skills match in labour markets, and solid labour market institutions to extract good value from higher levels of skills. Beyond these economic outcomes, investment in quality education and training also generates a wide range of social returns. There is evidence that education has the potential to build strong foundations for cohesive democratic societies and to contribute to sustainable and inclusive economic and social development (OECD, 2022^[17]). Education also supports the formation of well-informed citizens: evidence from PISA 2018 shows that

education systems where more students are taught how to detect biased information in school also display higher proportions of students who are able to distinguish fact from opinion (Figure 4). Sustained high-quality education and training also supports communities in proactively addressing challenges, such as climate change and also making the most of new opportunities, such as the digital transformation, the green transition and global value chains (OECD, 2022^[17]) (OECD, 2017^[23]) (OECD, 2019^[8]).

Education and skills policies are key to empowering individuals to make the most of available opportunities, but also to create new economic and social opportunities through innovation and creativity. At the same time, education and skills policies cannot eliminate or compensate for structural inequalities and historical injustices, which limit the development opportunities of many communities around the world. For instance, in more unequal countries, adult outcomes tend to be more influenced by family background (Paccagnella, 2015^[24]). In fact, inequalities in access to high-quality learning programmes, as well as ingrained experiences of discrimination and stigmatisation prevent the personal fulfilment of many vulnerable individuals. Therefore, education and skills policies must be considered alongside regulation, taxation and other economic and social policies (e.g. social protection, health care, labour market, environment, regional development, science and technology) as one of the pillars of how public policies can promote inclusive and equitable societies. Empowering individuals is key but unless this is accompanied by a systematic policy effort devoted to balancing resources and creating equitable structural conditions the possibility for education and skills policies to reduce societal level inequalities remains limited. This highlights the value of leveraging synergies with other policy fields to ensure that education and training policies have greatest impact on sustainable inclusive growth, equitable life changes for all, social well-being and well-functioning democracies.

Fostering synergies between educational research, policy and practice, and promoting partnerships between education, employers and communities to respond to learner needs

Systematically integrating research evidence into education policy and practice is fundamental for improving the learning experience and outcomes of all learners. It is also critical to improving the relevance and efficiency of education and skills systems. While investment is still lower than in other sectors, a number of countries are increasingly investing in research in education to inform the design and implementation of education and skills policies, including through experiments, systematic reviews and other forms of primary and secondary education research. In some cases, investment is reflected in funding research. For example, Norway doubled its spending on education research in the period 2007-2017 (NIFU, 2019, p. 95^[25]). In other cases, it focuses on processes to boost research production and mobilisation, including establishing agencies to raise research quality and facilitate its use, and introducing principles that help make research transformational (OECD, 2022^[26]). For example, the Netherlands established the Netherlands Initiative for Education Research to raise research quality and facilitate its use and the United States Institute of Education established principles to make research more relevant and raise its quality (OECD, 2022^[26]).

This goes alongside strengthened collaboration with networks of researchers and practitioners, and initiatives to ensure they contribute regularly to debates on education. In addition, there is a growing number of initiatives intended to facilitate the use of research in education. These include establishing dedicated brokerage institutions designed to mediate research for policy and practice and making research more accessible to users through funding research syntheses, practice guides and toolkits. Around half of the OECD countries have specific agencies or units to make it easier to use education research by improving access and making results understandable (OECD, 2022^[26]). A few are long-standing and widely known such as the What Works Clearinghouse in the United States, the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI Centre) in the United Kingdom and the Best Evidence Synthesis (BES) programme in New Zealand; others are brand new, such as the Australian Education Research Organisation (AERO), established in 2020. An outstanding example is the Education

Endowment Foundation in the United Kingdom that has become a world leader in making research synthesis more rigorous and more accessible through their Teaching and Learning Toolkit (see Box 1).

Box 1. Evidence for better learning: the Education Endowment Foundation’s Teaching and Learning Toolkit

The Education Endowment Foundation (EEF), established as an independent charity in 2011 in England, aims to reduce inequality in education through supporting schools to improve learning outcomes, particularly for disadvantaged students, via better evidence use. Activities involve:

- Summarising the best available evidence in plain language
- Generating new evidence of ‘what works’ to improve teaching and learning
- Supporting teachers and school leaders in using this evidence

The *Teaching and Learning Toolkit* synthesises research evidence on 30 pedagogical, institutional and relational approaches focused on enhancing teaching and learning at classroom and school levels. The studies are selected based on a systematic review, which stipulates the inclusion criteria in advance in order to avoid biased results. They are continuously updated in light of new research evidence, making it a live and dynamic resource.

The summary of evidence on each approach includes:

- Description of the approach
- Key findings
- Average impact on attainment, measured by the number of months of additional progress made by pupils
- Strength of evidence measured by the number of studies satisfying the inclusion criteria
- Average cost of a given intervention
- Recommendations on implementation

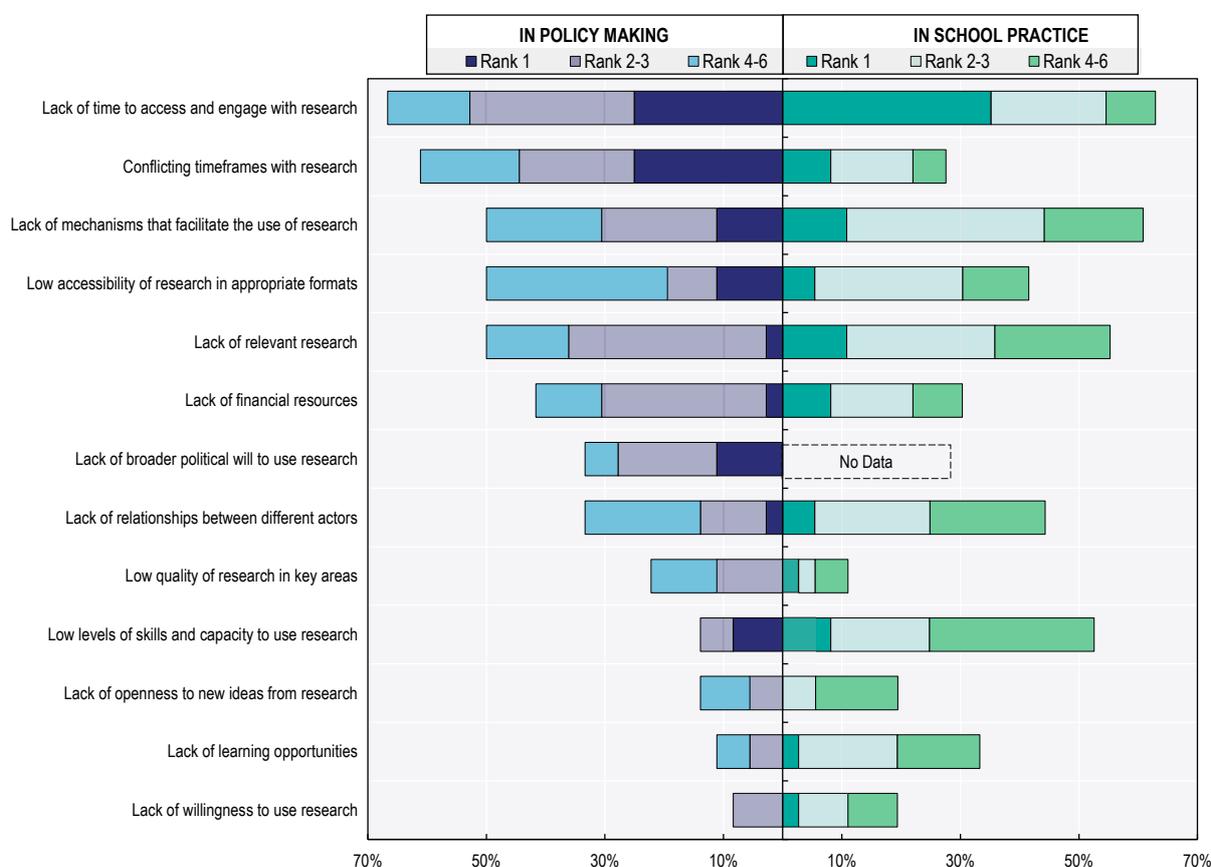
The Toolkit is meant to be a starting point for discussion between education professionals, relying on their judgement and expertise about what works in a particular school context and taking the Toolkit’s interpretations with caution. As of 2017, 70% of secondary school leaders used it to inform their decision making.

Source: EEF, “EEF launches updated Teaching and Learning Toolkit”, <https://educationendowmentfoundation.org.uk/news/eef-launches-updated-teaching-and-learning-toolkit> (accessed on 28 March 2022); EEF, *Teaching and Learning Toolkit*, <https://educationendowmentfoundation.org.uk/education-evidence/teaching-learning-toolkit> (accessed on 28 March 2022); (OECD, 2022^[26])

But, a range of challenges remain to systematically integrate research in policy processes and educational practices. Examples include the often poor relevance of research for both policy makers and practitioners, the low accessibility of research in appropriate formats and the lack of time to engage with research (see Figure 5). Also, many systems do not map research needs and gaps systematically, and do not have system-wide strategies for producing and using research (OECD, 2022^[26]). Furthermore, in most OECD education and skills systems, there is not yet a systematic strategy for institutionalising or improving the evaluation of the impact of education policies and education programmes (Golden, 2020^[27]). For this reason, in 2022, in an effort to contribute to establishing a culture for policy evaluation in education in the European Union, the European Commission launched the Learning Lab on Investing in Quality Education and Training to provide relevant authorities in the Member States with knowledge, tools, methods, and resources they can use for evaluating the cost-effectiveness of their public spending on education.

Figure 5. Barriers to using research in policy making and in school practice

Percentage of systems ranking the following barriers, by context, type of factor and rank, 2021



Note: Data was collected at the national and sub-national level. "Lack of broader political will" was not offered as an option for the practice context.

Source: OECD Strengthening the Impact of Education Research policy survey data

Countries are also gradually recognising the value of fostering partnerships with educators, educational leaders, families, employers, trade unions, private providers, communities and civil society organisations to respond in agile ways to learner needs. These involve collaborations to design and resource policies as well as partnerships for learning at the local and institutional level. The regular involvement of stakeholders – including practitioners – in policy design and implementation cultivates a sense of joint ownership and helps them build capacity over time. This directly benefits from the use of evidence generated by research as it grants stakeholders a better understanding of the rationale for reforms. For instance, consulting employers on existing labour market needs is crucial in shaping the offer of educational and training programmes at all levels and adjusted to local needs, especially in professionally-oriented education. Also, building consensus on education reforms with the relevant stakeholders, including education unions, is an important step to ensure the effective implementation of education policies (see Box 2 for an example of an international high-level involvement). In addition, the participation of stakeholders (e.g. employers, local communities) in the governance of educational institutions (e.g. vocational schools, higher education institutions) is a means through which to hold them accountable to society. Another example is the potential of partnerships with the global education industry to support digital transformation plans in education.

Box 2. The International Summits on the Teaching Profession

Established in 2011 by United States Secretary for Education Arne Duncan, the National Education Association and the American Federation of Teachers, the International Summit on the Teaching Profession (ISTP) brings together education ministers, union leaders and other teacher leaders from high-performing and rapidly improving education systems to review how best to improve the quality of teachers, teaching and learning. These annual summits are unique in providing the only international forum in which education ministers and teacher union leaders meet on a confidential basis to discuss educational policy and practice and set practical education targets for the coming year. Hosted by individual OECD and partner countries, each ISTP focusses on a given aspect of teacher policy. ISTPs are supported by background reports from the OECD and Education International, which synthesise evidence and research outcomes relevant to each Summit's discussion themes.

More generally, enabling lifelong learning in a rapidly changing and uncertain world requires first and foremost the creation of strong partnerships across all relevant stakeholders to maximise learning opportunities for all. Partnerships for learning, more prominent at the local and institutional levels, may benefit from the elevated role of local and institutional actors in supporting learning during the COVID-19 pandemic. To nurture responsive and resilient broader learning environments, putting education institutions at the heart of a dynamic and collaborative local education network may prove essential (OECD, 2021^[6]). For instance, strong connections between learning centres and families as well as co-operation with wider social services, surrounding communities, neighbourhood and institutions are particularly important for the development of young learners and children in disadvantaged circumstances or vulnerable moments such as transitions between education institutions (OECD, 2019^[28]). In Germany, collaboration within and between local networks has been identified as key to the success of an initiative that offers extra-curricular and cultural activities to students from disadvantaged backgrounds between the ages of 3 and 18. An evaluation from 2019 found that these networks benefited from the expertise of a broad range of actors, including schools, youth clubs, and cultural institutions, and contributed to the goal of building permanent networks of support for disadvantaged children (OECD, 2021^[6]). In Colombia, the Family School-Alliance Strategy supports the learning, well-being, and development of children and young people by strengthening co-operation between schools and families. It provides guidelines for schools to develop an action plan to connect with families, including concrete examples of successful practices of engagement with families and tools to enable schools to assess the home environment and to support successful home learning (OECD, 2021^[6]). In Mexico, the "Learning at Home" programme, launched during school closures in 2020, builds on collaborations with local communities and parents and targets remote and rural areas. Learning is primarily delivered through audio-visual content broadcast using a pre-existing educational television network. The programme also includes radio content aimed at students from Indigenous communities and available in 15 different languages. In addition, it offers teacher training in digital skills in collaboration with universities, technology firms, and non-profit organisations (OECD, 2021^[6]).

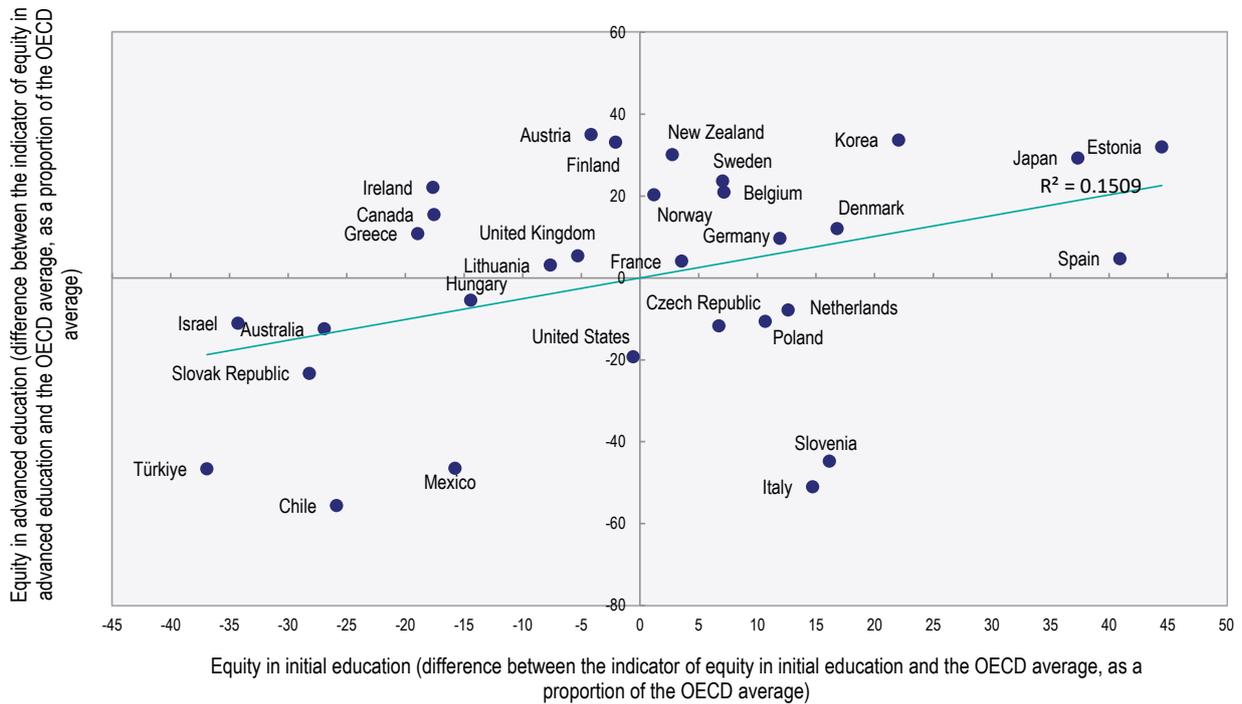
Session 2: Parallel Break-out sessions

Overall theme: Strengthening equity and inclusion in and through education

Achieving equity within education and skills systems is a key precondition for achieving equity throughout an individual's learning pathway, between individuals and across generations, and therefore for achieving more equitable and inclusive societies. In spite of increases in educational participation and attainment in OECD countries, educational inequality remains a concern (OECD, 2018^[29]). Educational inequalities in initial education trigger inequalities in subsequent life outcomes (e.g. in learning, earnings, health, civic engagement and social capital) for different groups within society, but also persist across generations and dampen social mobility (Blanden, Doepke and Stuhler, 2022^[30]; OECD, 2018^[31]) (OECD, 2022^[17]). A strong benefit of investing in equity in the education system is that it can foster equity through the education system later in life (OECD, 2022^[17]). Education can promote equal opportunities for all, and ensuring equity of opportunities in initial education is a first step. While several countries display equity of learning (relative to the OECD average, in terms of participation and quality) in both initial and advanced education, few countries display equity in advanced education (in relation to the OECD average) when equity is low in initial education (Figure 6).

The endeavour of strengthening equity and inclusion in and through education is increasingly benefitting from the opportunities provided by digital technologies to organise and personalise learning in innovative ways. Furthermore, countries are more and more focussing on meeting learners' cognitive, social and emotional needs as a strategy to create more inclusive learning environments that prioritise the full scope of an individual's developmental needs.

Figure 6. Equity in initial and advanced education



Notes: The indicator of equity in initial education is the average of the normalised scores of different proxy indicators or equity in initial education (from early childhood to secondary education): share of disadvantaged students (bottom quarter of 15 year-olds in PISA 2018) who attended early childhood education for at least two years (equity of participation indicator); and difference in the share of low-achievers in PISA 2018 between top and bottom quarter ESCS 15 year-olds (equity of outcomes indicator).

The indicator of equity in advanced education is the average of the normalised scores of different proxy indicators or equity in advanced education (post-secondary non-tertiary and tertiary education): difference in the share of 28-34 year-olds with tertiary education between those with high and low-educated parents (equity of participation indicator); difference in the share of adults aged 35 years and older enrolled in at least a post-secondary non-tertiary programme (post-secondary non-tertiary education or tertiary education) between those with high and low-educated parents (equity of participation indicator); difference in the share of 16-34 year-olds who have not completed post-secondary or tertiary education between those with high and low-educated parents (equity of outcomes indicator); and difference in the share of 25-64 year-old adults lacking basic skills between those with high and low-educated parents (equity of outcomes indicators).

All country values on the indicators of equity in initial/advanced education are then compared to the OECD average, and the differences expressed in percentages are represented on the chart. The OECD average corresponds to the arithmetic mean of the respective indicators for each of the OECD countries or sub-national entities included in the figure.

For data coming from the OECD Survey of Adult Skills (PIAAC): Data for Belgium refer to the Flemish Community only. Data for the United Kingdom refer to England and Northern Ireland jointly. The United States has collected three waves of data using the PIAAC instruments and data for the United States in the figure are based on the mean of the United States observations available (combined data from the 2012 and 2014 collections, and data from the 2017 data collection).

Calculations are based on (OECD, 2018^[32]) and data from OECD (2018^[33]), PISA Database 2018, <https://www.oecd.org/pisa/data/2018database/> (for indicators on equity in initial education) and OECD (2012, 2015, 2017^[34]), Survey of Adult Skills (PIAAC) Database 2012, 2015 and 2017, <https://www.oecd.org/skills/piaac/data/> (for indicators on equity in advanced education).

Source: (OECD, 2022^[17]), *Value for Money in School Education: Smart Investments, Quality Outcomes, Equal Opportunities*, <https://doi.org/10.1787/f6de8710-en>.

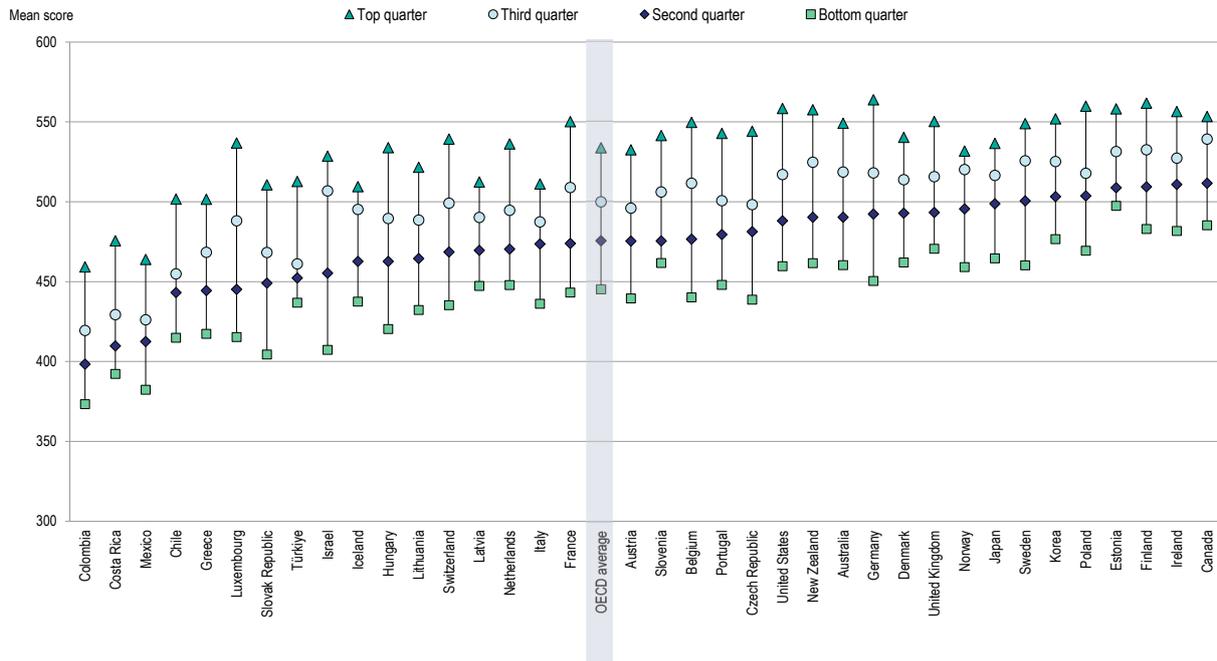
Theme 1: Equity and inclusion in education in a whole-person perspective

Key Issues

Levelling up: Raising educational outcomes through more equitable education opportunities

The COVID-19 pandemic demonstrated the critical role of education and skills systems in reducing learning gaps by addressing educational underperformance and promoting equal educational opportunities. The closure of educational institutions during the pandemic led to a widening of learning gaps and an increased risk of dropping out of education or disengaging from training among vulnerable learners. In many cases, the pandemic compounded previously established inequalities that reflected learners' differences in socio-economic background, identification with or belonging to a diverse group (e.g. migrants; ethnic groups, national minorities and Indigenous peoples), or special education needs. Lack of access to digital technologies, lack of ability to use online tools among both children and teachers, lack of parental support and the cumulative nature of learning were factors that led to widening inequalities in initial education. Similarly, differences in access and use of digital technologies in higher education penalised those with less digital experience, most of whom with disadvantaged backgrounds. The provision of vocational education and training and adult learning was also severely affected. Remote working conditions and business closures meant that many workers were unable to benefit from informal and non-formal learning opportunities because no effective alternative to face-to-face delivery was identified. In vocational education and training, work-based learning opportunities for learners were reduced and practice-oriented learning was disrupted (OECD, 2021^[35]). Young people who had just entered the labour market were especially penalised in their skills development efforts because of a lack of training delivery. Data from the Skills Outlook 2021: Learning for Life and from the EU Labour Force Survey (EU-LFS) suggest that participation in education and training decreased because of the pandemic. For example, in 2020, 9.5% of employed adults in the EU-27 had taken part in education and training in the previous four weeks, down from an average of 11.4% in 2019. Estimates suggest that, during generalised lockdowns in OECD countries, the number of hours workers spent in informal learning may have decreased by as much as 25% and the number of hours workers spent in non-formal learning may have shrunk by as much as 18% (OECD, 2021^[4]). Vulnerable workers, as those in unemployment in need of training, are likely to have been particularly affected.

More generally, too many learners from disadvantaged backgrounds are less likely to participate in education, perform well or pursue lifelong learning. Given that education is correlated with most of an individual's key life outcomes – employment, earnings, poverty levels, physical and mental health, well-being, social-mobility, crime rates and more (Mezzanotte, 2022^[36]) – disadvantaged learners are less likely to thrive throughout their lives. Disadvantage in education starts early. Children from socio-economically disadvantaged families are less likely than their more advantaged peers to participate in early childhood education and care. This difference in access to early childhood education and care compounds with other sources of family, neighbourhood and societal disadvantage, creating gaps between children of different backgrounds that widen as they advance through school. As shown by PISA, there are large cross-country differences in the extent to which socio-economic status influences students' performance in science, reading and mathematics (Figure 7). There is also extensive evidence showing that students belonging to specific groups (e.g. migrants; ethnic groups, national minorities and Indigenous peoples; special education needs) may perform less well as a result of barriers they face to learning. For instance, children from an immigrant background tend to be at a disadvantage compared to their native-born peers when it comes to access to and participation in education, even after accounting for social background (OECD, 2019^[37]). Those students without at least one parent with higher education are also more likely to enrol in upper secondary vocational programmes than in general ones and less likely to complete the level.

Figure 7. Mean performance in reading, by national quarter of socio-economic status

Note: Countries are ranked in ascending order of mean reading performance for students in the second quarter of ESCS

Source: OECD (2019^[37]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, <https://doi.org/10.1787/b5fd1b8f-en>.

Inequalities continue as students transition into higher education. Family, community, and schooling disadvantages result in: lower rates of entry to higher education; concentration of disadvantaged learners in more poorly resourced higher education institutions and in programmes of study with relatively poorer returns on investment; reduced rates of higher education study completion; and poorer labour market outcomes after graduation. Disparities in skill levels persist into adulthood. On average across OECD countries, the gap in literacy between individuals with low and high socio-economic status remains mostly stable between the ages of 15 and 27 (OECD, 2021^[4]). In addition, participation in adult learning by individuals with low levels of educational attainment (i.e. below upper-secondary qualifications) is almost 40 percentage points below that of adults with higher education qualifications (58% reporting participation in at least one adult learning opportunity in the past year). Older adults (56-65 years old) also tend to be underrepresented among participants in adult learning, only 22% reporting they had participated in adult learning over the past 12 months (compared to 47% for adults aged 25-40) (OECD, 2021^[4]).

Gender disparities also persist and influence educational trajectories and opportunities in the labour market. Boys are more likely than girls to repeat a grade and underperform in reading, and less likely to complete upper secondary education. Boys are also usually overrepresented in vocational paths and less likely to enter and graduate from higher education (OECD, 2021^[38]). Women have similar participation rates than men in formal adult learning (OECD, 2021^[4]). Yet they remain less likely to be employed and earn less than men across all levels of educational attainment and OECD countries, even among those having graduated from the same field of study (OECD, 2021^[38]). Young women are also less likely than young men to get a degree or vocational qualification in STEM fields and gender stereotypes remain visible in education and skills systems (Brussino and McBrien, 2022^[39]). Indeed, as shown in PISA 2018, even when boys and girls showed similar performance, a smaller proportion of girls than boys reported that they want to pursue a STEM qualification (OECD, 2019^[37]). Such gender norms are already evident in young children's views of their future (5-year-olds) as shown by the results of the International Early Learning and Child Well-being Study (OECD, 2020^[20]).

Raising educational outcomes for all through equity-focused policies is possible. Results from PISA show that, in some countries, the influence of social or immigrant background, gender or geography on educational outcomes is far weaker than in others. Furthermore, some countries have shown that this influence can be reduced over time. In initial education, effective policies to improve educational opportunity often involve better aligning resources with the needs of vulnerable learners; pairing high- and low-performing educational institutions; allocating the most experienced teachers to low-performing schools; building capacity to respond to the individual needs of learners; and specific pedagogical interventions for students with learning difficulties (OECD, 2022^[17]). Another important policy instrument consists of early warning systems to identify students falling behind and at risk of dropping out. In Latvia, the Tackling Early School Leaving project involves early warning indicators to identify learners at risk, individual support plans for students based on an assessment of various risk factors, specialised assistance and, in some cases, financial support to continue studying (OECD, 2021^[6]). Fundamental to the effectiveness of these policies is an empowered high-quality teaching profession with the capacity to identify individual students' needs and accordingly tailor their instruction. Also, high-quality early childhood education and care has been shown to provide a wide range of benefits for individual children – especially the most disadvantaged (OECD, 2021^[40]). These benefits include supporting social and emotional well-being, lowering risks of school dropout and even contributing to higher learning and employment outcomes later in life community. Colombia's Early Childhood Comprehensive Care Strategy "From Zero to Forever" promotes a holistic approach with a strong emphasis on parental engagement and co-ordination of different services (family, community, institutional) and with a strong focus on children in extreme poverty (OECD, 2021^[6]). Results from the TALIS Starting Strong 2018 survey suggest that some dimensions of quality in early childhood education and care vary according to the composition of children in centres. For instance, shortages of material and human resources as well as lower levels of parental involvement are more common in centres with children with more diverse backgrounds. At the same time, more adaptation in pedagogical practices is reported by staff working in early childhood education and care classes with higher shares of children from diverse backgrounds (OECD, forthcoming^[41]). Identifying and responding to disparities in quality is essential in light of the growing diversity of children in education systems, starting from the early years. More generally, addressing and accounting for diversity in all its facets – migration-induced, ethnic, cultural, gender, special education needs, giftedness, gender identity and sexual orientation – is fundamental for education and skills systems to be inclusive and promote strong and cohesive communities (Cerna et al., 2021^[42]).

In addition, vocational education and training contributes to engaging learners in education and training, as it can provide attractive alternatives to those who are not interested in academic learning in a typical classroom setting and those who struggle academically. It can therefore contribute to reducing dropout rates and to re-engaging early school leavers in the education system. To support the most vulnerable young students, various countries have put in place preparatory programmes, such as pre-apprenticeship programmes, and/or shorter programmes for vocational students at risk of dropping out. Such programmes provide additional support and coaching. France, for example, recently introduced the *prépa-apprentissage*, a pathway that aims to identify and close basic and employability skills gaps before starting an apprenticeship. Switzerland offers two-year 'EBA' apprenticeships (*Grundbildung mit Eidgenössischem Berufsattest*) designed for youth who face difficulties at school, struggle to find a three- or four-year apprenticeship, or risk dropping out, and these apprentices can receive individual coaching designed to help them improve their academic, technical and social skills (OECD, 2018^[43]). Estonia established funding for vocational education and training institutions to establish new programmes for at-risk youth, namely young people who have fallen out of compulsory education, or those who are not in education, employment or training, students who need enhanced support, and those with poorly defined career goals. Institutions can use the grants for curriculum development, including planning for out-of-school learning, and for training and networking activities for school staff and partners in the workplace (OECD, 2021^[6]). Austria's integrative apprenticeships programme targets vulnerable students at risk of dropout by offering them a special wage (negotiated with employers) and close guidance from a dedicated training assistant while

providing employers with a targeted subsidy. Training assistants define the nature of the training contract between the employer and the apprentice, prepare the workplace for the apprentices' arrival, and provide academic support throughout the training programme (Kis, 2016^[44]).

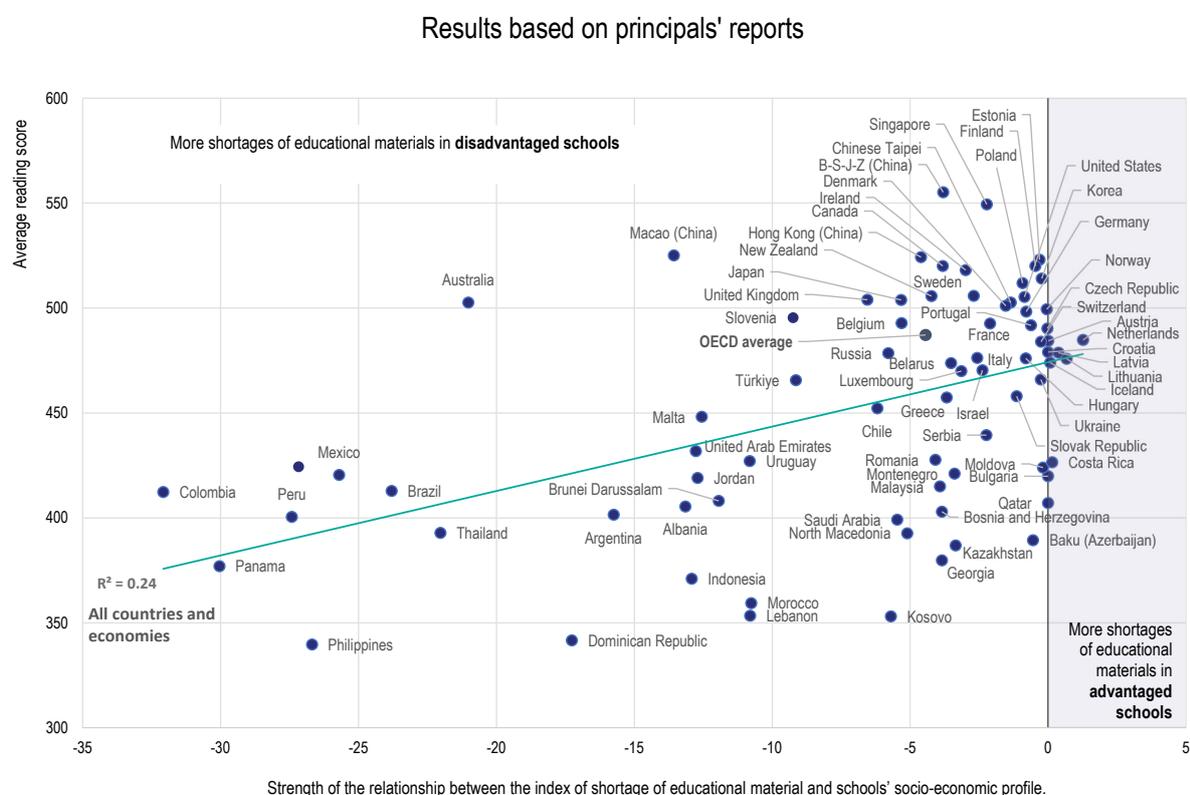
Efforts to address the pronounced inequalities in higher education have long centred on mitigating inequalities in ability to pay through the design of grant and income-related lending schemes (OECD, 2020^[45]) and, in some countries, broader selection criteria to reduce inequalities of access. More recently, digital technologies have opened other possibilities, such as the use of learning analytics to identify and intervene with at-risk learners, and have shown major successes in boosting rates of study completion among disadvantaged learners. Countries are also increasingly addressing equity of opportunities in adult learning, particularly among low-skilled adults. The most common policies involve providing relevant learning opportunities for low-skilled adults alongside dedicated quality career guidance; recognising skills of adults acquired through work experience; offering modular learning opportunities; providing targeted financial support to cover the costs of training; and regulating time allowances for adults to engage in training (OECD, 2019^[46]). This requires education policy makers to work closely with other government sectors, employers and trade unions to help promote flexible pathways in and out of education that evolve alongside labour market demands.

Aligning resources with the needs of learners

Most countries have explicit goals for their education and skills systems of broadening access and enhancing quality, equity and efficiency. Yet they have limited resources with which to pursue these multiple objectives, facing different spending choices and resource trade-offs. For instance, despite growing enrolment in and recognition of the value of high-quality early childhood education and care, investments in this sector remain below those for later stages of education and the proportion of private spending in total spending is higher for pre-primary education than for primary education (OECD, 2022^[17]). Likewise, while evidence shows the importance of work-based learning in vocational education and training for smoothening school-to-work transitions, employers are often reluctant to invest in such opportunities and/or receive limited support to do so. Moreover, despite mounting evidence of persistent mismatches between the demand for and the supply of skills in the workforce and the role adult learning can play in reducing mismatches, promote labour market integration, productivity and growth, among OECD countries the majority of adults does not take part in adult learning and is not interested in the current learning provision. As many as six in ten adults in OECD countries are disengaged from adult learning, meaning that they did not engage in learning and were not interested in learning over the previous year and among adults with few formal qualifications this figure was eight in ten adults, on average (OECD, 2021^[4]).

Against this backdrop, efficiency and equity are often presented as competing goals, and are discussed in terms of a trade-off and a matter of political preference. Yet, the results from research on both school-based and work-based interventions show that the relationship between efficiency and equity is not that clear-cut, and the pursuit of equity and inclusion goals is not necessarily at odds with efficiency (OECD, 2017^[47]; OECD, 2019^[37]) (OECD, 2022^[17]). Ensuring that learners with different needs and from different backgrounds have access to high-quality education from an early age, for example, can be an effective means to reducing systemic inefficiencies. While the overall level of investment in education up to a point is an important precondition for a quality provision for all learners (Jackson, 2018^[48]), beyond a certain level of investment what matters most is how resources are allocated within the system (OECD, 2021^[49]). In fact, PISA data suggest that at the system level, education systems where material resources are allocated more equitably among socio-economically advantaged and disadvantaged schools, tend to display better student performance in reading (Figure 8) (OECD, 2020^[50]). In this context, resource allocation policies appear as a particularly relevant instrument for policy makers to achieve equity and efficiency in education, whether initial education, vocational education, higher education or adult education.

Figure 8. Allocation of material resources related to schools' socio-economic profile and reading performance



Note: The horizontal axis displays the strength of the association between the school's socio-economic profile and the principal's concern of shortages of educational materials at the school. Positive values indicate that principals of socio-economically advantaged schools are more concerned than principals of disadvantaged schools. Negative values indicate that principals of disadvantaged schools are more concerned than principals of advantaged schools. A value of 0 means there is no difference between advantaged and disadvantaged schools.

Source: (OECD, 2020^[50]), *PISA 2018 Results (Volume V): Effective Policies, Successful Schools*, Table I.B1.4 and Table V.B1.5.5, <https://doi.org/10.1787/ca768d40-en>.

As countries seek to enhance the performance of all learners while also providing more equitable learning opportunities for different groups, there has been greater focus on ensuring that resources are directed to where they can make the most difference, i.e. in alignment with learners' needs. Providing equal opportunities for learning requires countries to ensure both horizontal equity (allocating similar levels of resources to similar types of provision) and vertical equity (allocating different levels of resources to learner groups with different needs) in the distribution of education resources (OECD, 2021^[49]). A typical strategy is to design funding allocation mechanisms that align resources with the needs of learners. In initial education, this involves a funding formula that considers the characteristics of the school's student body together with other aspects of the school, including its location; or targeted programmes for specific groups of learners, types of schools or given locations (OECD, 2021^[49]). This should go alongside a systematic monitoring of the progress of vulnerable groups (OECD, 2017^[47]). In the French Community of Belgium, the central level attributes a socio-economic index value to every student according to their residential area. Schools are ranked according to their average socio-economic index value, and 25% of schools with the lowest values qualify for additional teaching periods or funding allocations (at primary and secondary levels) (OECD, 2021^[49]). The Netherlands relies on formula-based funding using objective criteria (e.g. number of students, type and size of school) with a universally applied rule to determine the amount of resources each school is entitled to and schools receive extra funding for students with a risk of educational disadvantage (OECD, 2021^[49]). In England (United Kingdom), the Pupil Premium Programme allocates additional funding to schools for every student

who has received free school meals at any point in the last six years, and for current and previously looked-after children (OECD, 2017^[47]). In Chile, the Preferential School Subsidy is allocated to school providers based on the number of priority students (determined based on their socio-economic background or other complementary criteria, e.g. health-related, parental education level, geographic location) in the school, their educational level and their class attendance (OECD, 2017^[47]). In Lithuania, the funding formula takes account of student characteristics such as special needs, migrant status or national minority-language status and a funding premium exists to finance specialist support for students with special needs. Another strategy involves targeting resources to a specific group of students. For instance, Iceland launched a strategy for the education of young people with an immigrant background to support the academic attainment and well-being of learners with a mother tongue other than Icelandic. It involves specific measures that aim to improve parental engagement and prepare teaching professionals to teach in multicultural and multilingual contexts, support for mother tongues and active plurilingualism in schools, after-school programmes, and within the family (OECD, 2021^[6]).

Beyond the allocation of financial resources, the distribution of experience and best-practice across schools can also improve quality and equity in education. In this respect, TALIS 2018 results have shown that in many TALIS countries, experienced teachers are more likely to work in schools with a low concentration of socio-economically disadvantaged students. Further, the results also show that the TALIS countries characterised by a more uneven distribution of experienced teachers between advantaged and disadvantaged schools tend to display, at the system level, lower average scores of the most disadvantaged students in the PISA 2018 reading assessment. The same holds for the uneven distribution of teachers who have undergone comprehensive initial education (OECD, 2022^[51]). Accordingly, a range of policy initiatives aiming to achieve a more equitable allocation of experienced teachers or school leaders across schools can help foster equity. Among TALIS countries, experienced teachers are more likely to work in schools with a large share of disadvantaged students in Colombia, Israel and Shanghai (China) (OECD, 2022^[51]). Another policy lever used in some education systems to enhance equity relies on incentivised knowledge- and experience-sharing among high- and low-performing schools, building on matching effective teachers with less effective ones. (Papay et al., 2020^[52]). In England (United Kingdom), the Department for Education and Skills launched the London/City Challenge between 2003 and 2011 to improve education in the capital. To do so, the programme provided good and outstanding schools with a wide range of opportunities to share their practices and learn from the experience of other successful schools, while also supporting weaker schools. It also grouped schools similar in terms of their student intake into so-called “Families of Schools” and encouraged them to work together on their improvement, while providing targeted support to the weaker schools (OECD, 2018^[53]). In Denmark, the Ministry of Education has created a national body of learning consultants who work with schools and municipalities in their improvement efforts. Learning consultants facilitate peer exchange through their work in groups of schools, bringing together both evidence from research and practical knowledge from the field. This initiative thus creates a circle of learning and evidence that brings central knowledge to schools and municipalities, but also from the local to the central level (OECD, 2019^[54]). In Brazil, the North-East state of Ceará provides a vivid example of system resilience in education, placed among the states with highest performance in the country despite the 5th lowest GDP per capita among 26 states. One of the factors underpinning this education success story is the provision by the state education authorities of technical assistance for municipal school networks, including teacher training focused on classroom practice and school visits to support the sharing of best practices. This is complemented by peer support at the school level through the programme Escola Nota 10, which gives rewards to top schools providing technical assistance to low-performing schools (Loureiro et al., 2020^[55]). In Shanghai (China), the municipal education commission has developed a range of approaches to facilitate peer learning between schools. It commissions “good” public schools to take over the administration of “weak” ones, under the leadership of the “good” public school deputy principal and with support from a team of experienced teachers in view of transferring the ethos, management style and teaching methods of the good school to the poorer school. Such an arrangement not only benefits the poorer schools; it also gives the good schools more room to

promote their teachers. A variant of this approach is to establish a consortium of schools, where strong and weak schools, old and new, public and private are grouped into a consortium or cluster, with one strong school at the core (OECD, 2011^[56]) (Jensen and Farmer, 2013^[57]).

In higher education, in most OECD countries, there are provisions for means-tested student financial aid to promote the participation of underrepresented and disadvantaged groups. In adult learning, targeting support to equip participants who lack foundation skills with such skills can promote participation and engagement among adults who would most benefit from skills development opportunities (OECD, 2021^[4]). For instance, in Korea, lifelong education vouchers target low-income adults who can use the financial support to pay attendance fees and course materials. Similarly, dedicated resources to reduce barriers to women's access to adult learning could facilitate their participation. For example, time and timing concerns and cost weigh on women more heavily than on men because they generally assume responsibility for caring – which limits the time they have for different activities and increases the cost of participation because of the need to pay for alternative caring arrangements (OECD, 2021^[4]).

Theme 2: The role of digitalisation to strengthen relevance and inclusion in education

Key Issues

Reimagining education: A bolder vision for how to use time, spaces, people and technology to give learners greater ownership over what, how, where and when they learn over their life

Digital technologies offer multiple ways to enhance relevance, equity and inclusion in education. General-purpose and specific learning technologies enable new forms of learning, providing access to more interactive and adaptable learning resources, facilitating different forms of collaborative learning and the integration of learning and assessment, and enhancing communication between learners, educators and families (National Academies of Sciences, Engineering, and Medicine, 2018^[58]) (Paniagua and Istance, 2018^[59]) (OECD, 2021^[60]). In early childhood education, digital technologies (e.g. tangible coding technologies, robots) can be used to support active play in groups and the development of foundational digital skills (Bers, Strawhacker and Sullivan, 2022^[61]). Digitalisation provides new tools for teaching in both general education and vocational education and training, which can support the optimisation of educators' time and facilitate meaningful professional development and collaboration (Minea-Pic, 2020^[62]) (OECD, 2021^[63]) (European Commission, 2020^[64]). It is also transforming career guidance with richer and more equitable exploration of career pathways, including virtual work placements and other forms of direct interaction with employers, for both young people and adults (Cedefop, 2021^[65]). Furthermore, digitalisation widens access to education for non-traditional learners and learners in remote areas via diverse forms of distance and online learning, open educational resources and Massive Open Online Courses (MOOCs), and provides new tools for learning recognition and accreditation, such as flexible and stackable credentials, connecting formal, non-formal and informal learning (Orr, Rimini and Van Damme, 2015^[66]) (Conrad, 2022^[67]) (Ahn, Pellicone and Butler, 2014^[68]) (OECD, 2020^[45]).

Educational institutions are now waking up to an entirely new learning ecology, where a multiplicity of sources and sites for learning coexist. Digital technologies are breaking traditional constraints of time and space for teaching and learning. The standardised processes and homogeneous structures of the past – the traditional classrooms and student groupings, the common curriculum and its rigid disciplinary division, the focus on transmission and individualised assessments and so forth – steadily lead the way to more flexible and open educational frameworks (OECD, 2021^[6]) (OECD, 2022^[69]). Meanwhile, the arrangements with which learners and educators come together are becoming far more diverse – individual and group sessions, with one educator or a team of educators, focused on one subject and building on

interdisciplinary projects, blending face-to-face and virtual encounters, through synchronic and asynchronous work (OECD, 2017^[70]) (Broadband Commission for Sustainable Development's Working Group on Digital Learning, 2021^[71]). At the same time, the dividing lines between formal, non-formal and informal learning are eroding. This occurs when educators ground their teaching on learners' interests, and link academic goals to experiences outside the educational institution. It occurs when learning pathways are planned with the involvement of learners within broader learning ecosystems, and when the resulting diversity of learning pathways is recognised as valid – for instance, through flexible and stackable credentials (Kato, Galán-Muros and Weko, 2020^[72]) (Hannon et al., 2019^[73]).

Transforming learning through digitalisation: Building on research evidence and developing a supportive policy framework

The COVID-19 pandemic spurred an acceleration and intensification of the use of digital technologies in the delivery of education. Learners and educators boosted their capacity to use digital technologies for learning like never before. This experience also revealed potential for innovation in education, leading education and skills systems to explore digital frontiers and reconsider the use of educational data. Education and skills systems are now considering effective ways to integrate digital technology for learning at all levels. This requires policy makers to build a supportive policy framework covering areas such as the funding of education, quality assurance, certification of learning, capacity for digitalisation, safety and privacy, the organisation of institutions and the use of time. This starts with the development of an overarching strategic vision for digital education embedded in the wider policy ecosystem (OECD, forthcoming^[74]). In Australia, the Schools Digital Strategy of New South Wales is specifically connected with a range of other government strategies and policies, and its investment map has been co-designed by the Department of Education and the New South Wales Treasury (NSW Department of Education, 2019^[75]). Centred on an executive vision that describes its underlying hypotheses, the Strategy provides a detailed account of its governance arrangements, implementation details (e.g. actions, timing), pillars as well as immediate focus areas. In addition, there is a need to both make effective use of existing research on the impact of digital technologies on learning and to strengthen such research to identify best practices in this area.

The use of digital technologies in education holds significant promise. Smart technologies, such as artificial intelligence (AI) and machine learning, robots and blockchain technologies, have the potential to improve the quality and equity of learning (OECD, 2021^[60]). AI-powered adaptive learning analytics, such as intelligent tutoring systems, can track learners' progress, identify learners at risk of dropping out and pinpoint where learners need help and where they excel. Smart technologies can also support inclusive education. AI-based applications such as speech-to-text and auto-captioning can serve visually- or hearing-impaired learners to better participate in classroom activities. Most OECD countries have made such applications available to schools and higher education institutions to support students with special needs. Robots may allow educators to engage in greater personalised teaching and learning in the classroom. Simulators, virtual and augmented reality allow learners, especially those in vocational education and training programmes, to develop practice-oriented skills in a safe environment that mimics the workplace (European Commission, 2020^[64]). Blockchain-based credentialing shifts ownership of credentials from institutions to learners, giving them greater discretion over what, where, how and when to learn, streamlining and diversifying the recognition of upskilling and reskilling activities. This facilitates the movement of learners and workers across different institutions and may incentivise them to multiply their learning opportunities by adding micro-credentials to more traditional degrees and diplomas. There are multiple examples of digital degrees issued on Blockchain in North America, Europe and Asia: for example, in Europe, the European Blockchain Services Infrastructure (EBSI) allows for diploma certification (Smolenski, 2021^[76]). Moreover, the very use of smart technologies in education connects learners with the surrounding digital society and prepares them to use (and see the use of) digital tools and solutions for lifelong learning.

However, the use of digital technologies in education carries similar risks as other more traditional education methods. These may include widening inequalities resulting from unequal access or stronger

effectiveness for advantaged students; challenges to ensuring the quality of the digital resources used; and disparities in the capacity of educators and learners to make full use of their potential. There are also concerns about the confidentiality of learners' personal information and excessive screen time exposure, especially for young children. Another concern is the use of algorithms to make computerised decisions on learning interventions (e.g. identifying potential early school leavers) as there is a risk the bias of both developers and society vis-à-vis certain student groups results in discrimination (as can be the case in traditional education). Addressing these risks requires a co-ordinated effort across all education levels and all policy areas, from investing in digital infrastructure and equipment for education institutions and learners to developing sound regulations addressing issues such as cyber security, data protection and privacy, educators' digital competencies, curricula with a meaningful integration of digital technologies, and quality assurance (including the quality of algorithms) (OECD, forthcoming^[74]). For instance, several OECD countries have designed funding mechanisms in view of addressing disparities in digital capacity across educational institutions (OECD, forthcoming^[74]). Since 2017, France has strengthened the digital capacity of around 7 000 rural schools through targeted funding part of the Innovative Digital Schools and Rurality Programme (*Programme Écoles numériques innovantes et ruralité*) (Ministère de l'Éducation Nationale et de la Jeunesse, 2018^[77]) (Echazarra and Radinger, 2019^[78]). Several countries are also reinforcing the digital competencies of educators. Spain published a National Framework of Digital Competence for Teachers in 2020 and is promoting specific training courses in which teachers can exchange with peers from their country and abroad, creating an important network for their professional development (OECD, 2021^[6]). Coordinating education policies with policies outside of the education realm also matters for building capacity for digital education. Such policies can include, for instance, labour market or social policies to address financial or time-related barriers to adult participation in training, and public employment and management-related policies (OECD, forthcoming^[74]). There is also a need to establish a good governance framework for collaborating with private sector actors.

As the use of digital technologies in education remains exploratory, it is also crucial to promote research on it to garner strong evidence of its effectiveness in different contexts and for different age groups. This can benefit from the emergence of a new "science of learning" based on the interdisciplinary integration of research in neuroscience, cognitive psychology and many neighbouring scientific disciplines, including artificial intelligence. The "science of learning" holds good promise of progressively altering and improving our understanding of human learning and our institutional approaches to learning. Existing studies of individual learning technologies suggest that they are rarely used to their full potential or in pedagogically transformative ways (Damşa et al., 2015^[79]) (Whitmer et al., 2016^[80]) (Bond et al., 2020^[81]) (Price and Kirkwood, 2011^[82]). This may be due to a lack of capacity, training and support, but also due to technologies' insufficient adaptation to learners' and educators' needs. Creating institutions and procedures that strengthen educators' interactions with the EdTech sector and their role in the development, testing and selection of technologies can be an important strategy to foster the use of research evidence and educators' voice in the EdTech sector (OECD, forthcoming^[74]). Projects such as EDUCATE, in the United Kingdom, have sought to foster exchange between the EdTech sector and the teaching profession to ensure that EdTech products serve users effectively (OECD, 2021^[60]) (Cukurova, Luckin and Clark-Wilson, 2018^[83]).

Addressing the challenges and pressures that stifle innovation and inhibit the change required to achieve a bolder vision for education

Education is often seen as a conservative sector, with relatively little innovation and prudent adoption of new practices. The COVID-19 pandemic, for example, exposed the slowness of education in embracing the opportunities given by digital technologies prior to the pandemic in spite of considerable investments in infrastructure and teacher training. While innovation goes beyond the rise and widespread use of digital technologies, the use of information and communication technology (ICT) in education has been one of the profound drivers of change over the past decade (Vincent-Lancrin et al., 2019^[84]). This trend has accelerated with the COVID-19 pandemic that led most OECD education and skills systems to embrace

digitalisation in one way or the other. Yet, teaching and learning are a mixture of different practices, involving digital technology or not. Innovation in education is actually the result of a variety of different processes that can have multiple facets: the introduction of new products (e.g. textbooks, digital learning resources), new processes (new pedagogical practices or professional development), new marketing and external relation techniques (e.g. new forms of communication with students and parents), etc. In a post COVID-19 context, the need to rejuvenate and strengthen education and skills systems is essential. It should come both from the innovation drive that has been unleashed during the pandemic, but also from disciplined education policies on innovation. Innovation is not an end in itself: it should improve educational outcomes. At the same time, innovation as a process usually results in professional learning for educators (and other education stakeholders) and has value beyond immediately leading to enhanced results.

In initial education, one major hurdle to educational innovation comes from the possible resistance of teachers, parents, or even students themselves. Innovation takes time and, at the beginning, requires more effort from teachers and often from students, who have to develop new ways of working, understand when the innovation is useful or not, and get out of their comfort zone. Several aspects are critical to support teachers in adopting innovative practices (Vincent-Lancrin et al., 2019^[85]): clarity in the objectives and modalities of the innovation; support from their hierarchy; continuous learning opportunities; examples of lesson plans, assignments, assessments, and other resources supporting teachers' preparations for teaching. A second challenge to educational innovation may also lie with parents, students and public opinion. Students and parents are accustomed to certain formats of schooling and may feel threatened by change, especially if they feel it may alter their future employment chances. Time is of the essence and innovation is often progressive and incremental. This may rely on early adopters before it spreads (or not). When educational innovation is perceived as possibly risky, transparency about its unknowns, safeguards, and communication with parents and students are essential to foster trust. In addition, it is important to provide schools, teachers and students with safe environments against failure in innovation and ensure school communities can learn from failures without being penalised (OECD, 2013^[86]). A third potential challenge to education innovation lies with the uncertainty associated with its outcomes. While it is not always clear that commonly held practices are effective, they often appear as "normal" when widely adopted, while new proposed innovations may appear as "risky". For policy makers, investing in robust scientific evaluations of innovative practices is critical, both to continuously improve them, but also to convince reluctant parents and teachers that they can be adopted. This can also take a regulatory dimension, as is typical of other sectors such as health care where introducing a new drug on the market requires demonstrating a positive treatment effect. This model is gaining ground in education, with support given to efficacy and effectiveness studies, but is far from being widespread yet.

While governments alone may not implement innovation in the classroom, they can play a key role as stimulators and enablers, focusing key resources, setting a facilitative policy climate, and using responsibilities to allow innovation rather than compliance. To that effect, policy makers can develop proper innovation policies, better identify key agents of change, champion them, find more effective approaches to scale up and disseminate innovation – so as to make innovation a culture in their education system rather than a mere output. As proposed in the joint OECD – Education International Principles for an Effective and Equitable Educational Recovery, it is key to encourage a collaborative culture of innovation in partnership with school communities (OECD and Education International, 2021^[87]). In Ireland, the Prime Minister's *Creative Ireland* programme has brought together several ministries to put creativity and its further development at the core of Irish education, culture and economy. The programme includes many population-facing activities aimed at getting parents, students and communities engaged in the process. In education, it provided teachers with professional development, developed examples of innovative practice at the school level, created communities of practice, and tried to align incentives within its education system. In Quebec (Canada), the Digital Education Plan has taken a holistic approach to innovation and focused on empowering stakeholders to use technology in effective and appropriate ways in their context, with just in time professional learning opportunities, distributed network of local support – in addition to the provision of digital resources.

Harnessing the opportunities and mitigating risks of digitalisation for equity and inclusion

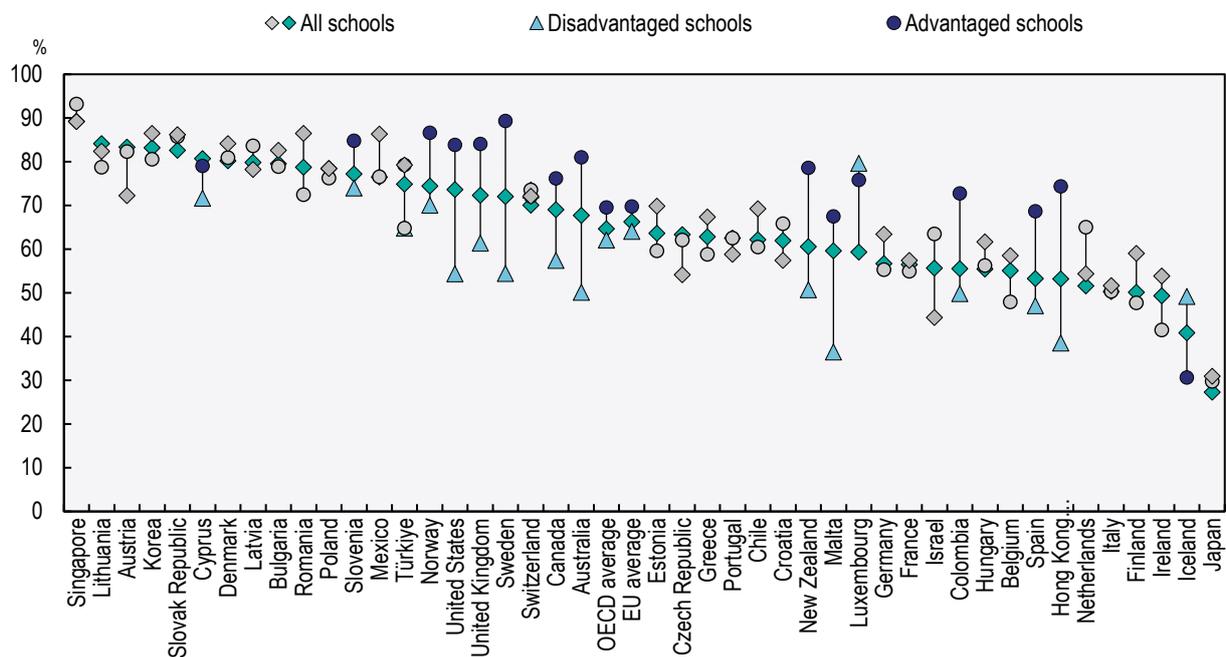
During the COVID-19 pandemic, learners and educators alike were rushed into virtual classes, learning platforms, digital learning environments, and virtual collaborative networks. The alternative digital learning modalities used during this period exposed the disparities in access to digital resources, connectivity and digital skills that exist between different socio-economic groups, creating significant learning gaps. As shown in Figure 9, prior to the pandemic, in a number of countries, schools' capacity to enhance teaching and learning using digital devices, according to principals' perceptions, was lower in disadvantaged schools. Disadvantaged learners tend to face barriers to device ownership and Internet access and tend to have lower digital skill levels on average. They are less likely than advantaged learners to use the Internet to read the news or to obtain practical information. As digital technologies are further integrated into learning in the post-COVID-19 world, and in a way similar to traditional teaching and learning strategies, it is important for education and skills systems to carefully assess the potential equity implications and devise strategies to mitigate them. Immediate policy measures targeting populations most at risk of exclusion from distance education during the COVID-19 pandemic included subsidies for devices (personal computers, laptops), the provision of access to asynchronous learning platforms and improved access to infrastructure for learners in remote areas (OECD, 2021^[88]). In addition, a range of interventions to bridge gaps in learning achievement due to remote learning periods have targeted specifically vulnerable learners (e.g. disadvantaged learners, minority groups, learners unable to access distance learning) (Gottschalk, forthcoming^[89]) (OECD, 2021^[88]). The Transforming Education Summit convened by the United Nations proposed three principles for taking work forward in this area: (i) Put the most marginalised learners at the centre; (ii) Develop free, high-quality digital education content and platforms; and (iii) Facilitate pedagogical innovation and change.

Education and skills systems play a key role in supporting all learners, including the most disadvantaged, in gaining access to the digital environment, developing digital skills, and critically, becoming digital citizens (Burns and Gottschalk, 2019^[90]). Within initial education, as digital technologies increasingly permeate education systems, there needs to be equity criteria to systematically allocate more funding for digital education to certain categories of schools or students, and revised funding mechanisms when needed to achieve a more equitable distribution of funding for digital education (OECD, forthcoming^[74]). Also, further investment in fast and reliable connectivity is critical to ensure equitable access to learning (OECD, forthcoming^[74]). A range of approaches can help bridge connectivity gaps for learners, including targeted funding to improve Internet access in schools located in areas unlikely to benefit from commercial investment, or leveraging alternative technologies to provide connectivity for learners or schools in very remote locations (OECD, forthcoming^[74]). In addition, regulation also needs to prevent potential design biases in advanced technology that could impede equity (e.g. bias affecting socio-economically disadvantaged students in the development of certain algorithms associated to education interventions) (Gottschalk, forthcoming^[89]). Another major part of the policy response is ensuring that all learners have adequate skills in order to make full use of digital opportunities and to protect themselves from digital risks. This goes alongside ensuring teachers and educators are equipped with the knowledge, skills, and resources to use digital tools effectively and to support learners' in the use of these tools. Country approaches typically target curriculum or support for curriculum implementation, learning frameworks, teacher education and professional learning, extracurricular activities, or information to stakeholders on how to target digital skills and inclusion of learners. For example, in Australia, the Digital Technologies in Focus programme provides support for disadvantaged schools in implementing the Australian Curriculum: Digital Technologies through specialist digital technologies and provision of ICT Curriculum Officers; and the Digital Literacy School Grants funds projects in schools supporting innovative ways of implementing the curriculum, prioritising under-represented and disadvantaged groups (Burns and Gottschalk, 2019^[90]). Estonia has developed tools to measure the digital skills of teachers and students, and the digital readiness of schools. The Innove Foundation developed digital competency assessments for students in grades 9

and 12, including in vocational education and training, with feedback provided to students and schools. Also, the Digital Mirror is a tool used to help schools assess their digital maturity and develop an improvement plan (OECD, 2021^[6]). In higher education, digital inequalities might become, in addition to financial circumstances, the main source of disadvantage in learning. A policy response would involve adjusting the financial support for learners in higher education to the digital learning environment, including strengthening the digital skills of learners.

Figure 9. Schools' capacity to enhance teaching and learning using digital devices (2018)

Percentage of students in schools whose principal agreed or strongly agreed that teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction



Notes: The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS). A socio-economically disadvantaged (advantaged) school is a school in the bottom (top) quarter of the index of ESCS in the relevant country/economy; Statistically significant differences between advantaged and disadvantaged schools are marked in a darker tone; Countries and economies are ranked in descending order of the percentage of students in schools where teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction.

Source: (OECD, 2020^[50]), *PISA 2018 Results (Volume V): Effective Policies, Successful Schools*, Tables V.B1.5.15 and V.B1.5.16, <https://doi.org/10.1787/ca768d40-en>.

At the same time, if used appropriately, digital technologies can contribute to more equitable and inclusive education systems, in particular, through the personalisation of learning. This includes the use of different teaching formats for different learners; the ability to fine-tune diagnostic assessment (e.g. learning analytics, adaptive assessment); and facilitating the learning of specific groups such as students with special education needs (e.g. assistive technology, greater access to learning and mobility) or migrant students (e.g. translation devices). For example, for newcomers who do not speak the language of instruction, tools such as captions and subtitles can support language learning and social robots can be used as tutors. In Sweden, specialised teachers are available on digital platforms for students' heritage language instruction (Cerna, 2019^[91]). In Norway, online resources are available for newly arrived children. Materials are available in Norwegian and six other languages to help students learn Norwegian, but also mathematics, science and English (OECD, 2021^[21]). In Germany, the federal programme *Sprach-Kitas*

introduced a focus on digital technologies in 2021 to support early childhood education and care centres with high shares of children at risk of developing language special needs. The target groups include migrants, refugees and children from educationally disadvantaged families and the programme seeks to promote inclusive language development in children that recognises their diverse identities, and to facilitate workforce development through workshops, peer learning and by sharing educational materials. Thus, not only are these tools used to promote inclusion of students, but also to support teachers' professional learning and to manage their workloads, for example. Digital technologies can also be a means to strengthening communication between teachers, school leaders, and the families of children with specific needs.

Moreover, digital tools can be used to provide extra learning resources for disadvantaged learners to reduce disparities in learning opportunities (Gottschalk, forthcoming^[89]). For instance, in Korea, the Cyber Home Learning System (CHLS) is designed to balance the inequity arising from families with a higher socio-economic background who often provide private tutors for their children outside of school. To compensate, the CHLS tool for distance learning provides free online tutors who can help students regardless of socio-economic background (Avvisati et al., 2013^[92]). In Australia, the digIT programme, funded by the federal Department of Education and Training, targets year 8-9 students from groups that are under-represented in ICT and STEM fields (e.g. female, disadvantaged, rural/remote, and/or indigenous) and gives them the chance to attend a digital technology summer school, including an additional five months of mentoring and a follow-up residential school (Burns and Gottschalk, 2019^[90]).

Theme 3: Meeting learners' cognitive, social and emotional needs and rethinking schools' organisation for relevance, equity and inclusion

Key Issues

Reshaping curricula to foster equity in and through education

Curricula frame the wide educational experience of learners to meet their different cognitive, social and emotional needs. But they also frame approaches to equity in education and foster the formation of knowledge, skills, attitudes and values for individuals to contribute to and flourish in equitable and inclusive societies (OECD, 2021^[5]). Research on the learning outcomes of disadvantaged groups finds that curriculum can be effectively designed to respond to the unique needs of diverse learners (Darling-Hammond et al., 2019^[93]). As a result, as documented by the OECD Future of Education and Skills 2030 project, countries are increasingly designing curricula that enable equity in education, adopting a whole-child-and-person development approach via learning and assessment practices that support all learners to thrive (OECD, 2021^[94]). Some countries focus on equality, i.e. offering equal opportunities to all learners (e.g. minimum curriculum standards or a core curriculum). Others take an equity-focused approach, providing differential support for learners based on their individual needs (e.g. remedial learning for learners with difficulties). Some others embrace diversity and embed inclusion as the principle of curriculum design and implementation (e.g. recognising the cultural identity of individual learners) (OECD, 2021^[94]).

An influential international framework is the Universal Design for Learning (UDL), a framework developed by a non-profit education research and development organisation (CAST) to improve and optimise teaching and learning for all people based on scientific insights into how humans learn. The UDL framework supports teachers to make the shift from traditional models of education to approaches that value and are prepared for the variability all learners bring. It seeks to adapt curriculum design and implementation to make more inclusive learning experiences for diverse groups of learners. UDL takes a people-first approach to planning learning. It asks educators to think about who they will teach and what those learners

bring with them before they think about what they will teach. UDL is focussed on ensuring all learners get a chance to learn in ways that work for them. It is about removing barriers and opening doors to learning. It is driven not only by the findings from neuroscience and educational research but by a vision for equity. It is based on three major principles, each with a range of actions: (i) provide multiple means of engagement (e.g. facilitate personal coping skills and strategies); (ii) provide multiple means of representation (e.g. promote understanding across languages); (iii) provide multiple means of action and expression (e.g. optimise access to tools and assistive technologies) (OECD, 2021^[94]).

At all levels of education, from early childhood education and care to vocational education and training or higher education, a curriculum that enables equity in education requires responding to the individual needs of learners, empowering them, and diversifying modes of learner-educator interaction. A personalised curriculum allows adaptations for diverse learners, e.g. individualised learning goals or plans; relevant choice of content and learning activities in accordance with learners' prior knowledge and experience as well as skills and interests. A digital curriculum can remove some barriers to learning so learners can learn from e.g. home, from refugee camps, from hospitals; support diverse learners through assistive technology (e.g. screen readers, Braille switchers); help learners with difficulties through tutoring systems that provide real-time and frequent feedback to students; facilitate early diagnosis of learning difficulties with subsequent adjustment of learning strategies (learning analytics, Big Data). Cross-curricular content and competency-based curriculum have the potential to support equity goals by empowering all students, regardless of background, to engage in practical and demanding learning experiences. A flexible curriculum allows making specific curricular choices on learning content and goals, pedagogy, assessment, as well as time and place of learning to adjust to learners with specific needs (e.g. migrant students) (OECD, 2021^[94]). Other approaches that promote equity and inclusion through the curriculum include: a gender-sensitive curriculum; direct or indirect references to diversity, such as gender fluidity and the history of ethnic minority groups; accommodations and modifications for specific groups (e.g. for learners with special education needs; gifted learners; rural contexts); and a consistent citizenship education based on a participative pedagogy.

A more specific strategy to ensure multiple opportunities for learning is to adapt a gyre or spiral approach to curriculum content design in key subject areas. Countries such as Estonia, Ireland and New Zealand design subject content deliberately repeating topics across grades, learning cycles and education levels in ways in which a deepening of students' understanding is ensured over time, while addressing content overload (OECD, 2020^[9]). Another specific strategy to adjust learning to the needs of individual students is focussing curriculum design on "key concepts" or "big ideas" rather than detailed subject knowledge content areas. For example, in British Columbia (Canada) the "big ideas" approach was used to address curriculum overload and ensure each learner focusses on deepening own 'understanding' of key concepts (OECD, 2020^[9]). Such approach to curriculum design enables different learners to differentiate their learning strategies while prioritising understandings of key concepts and big ideas as the foundational knowledge necessary for all.

More broadly, as proposed by the OECD Learning Compass 2030, it is fundamental that the curriculum promotes knowledge, skills, attitudes and values that ensure individuals contribute to shaping more equitable and inclusive societies. A curriculum that supports all learners to acquire strong skills throughout life will not only provide them with the opportunity to succeed in a rapidly changing world, but also guarantee that every person has the chance to develop a sense of belonging, self-worth, and to participate fully in society. Also, a curriculum that enables equal opportunities for all can help individuals move up the social ladder, and thus help to create more equitable societies (OECD, 2012^[95]; OECD, 2018^[29]). For example, to enhance the representation as well as inclusion of diversity in educational institutions might lead to a better representation and inclusion of diversity in the labour market. A curriculum that emphasises civic skills translates into greater levels of civic participation such as voting and volunteering, all of which help to build safer societies and social cohesion (OECD, 2010^[96]).

Education and skills systems are increasingly seeking to support open, diverse and tolerant societies, as education and training can play a significant role in countering racial, ethnic and national prejudice among individuals. Education and training for living in an interconnected and diverse world can also contribute to forming generations of citizens who care about global and intercultural issues and who are able and willing to take action for sustainable development and collective well-being. The Transforming Education Summit convened by the United Nations called for education and skills systems to build the foundations for learning to live together through ensuring curricula and learning materials promote gender equality, peace and non-violence, and appreciation of diversity, in line with SDG target 4.7 and SDG 5.1. The PISA 2018 assessment asked students about ten learning activities related to global competence, with 62% of students reporting learning how people from different cultures can have different perspectives on some issues, and 76% of students reporting learning about different cultures (Mostafa, 2020^[97]). In increasingly diverse societies, facing new challenges, such as those associated with the emergence of social media, promoting citizenship education among curriculum strategies is increasingly important for fostering equity, inclusion, cohesion and sustainability within and between our societies. Citizenship education is broadly understood to refer to “a subject area which aims to promote harmonious co-existence and foster the mutually beneficial development of individuals and the community in which they live. In democratic societies, citizenship education supports students in becoming active, informed and responsible citizens, who are willing and able to take responsibility for themselves and for their communities” (European Commission/EACEA/Eurydice, 2018^[98]). Such education might also equip learners to “learn to learn together”, work better together and acquire the skills to communicate with people from different cultures (Cerna et al., 2019^[99]).

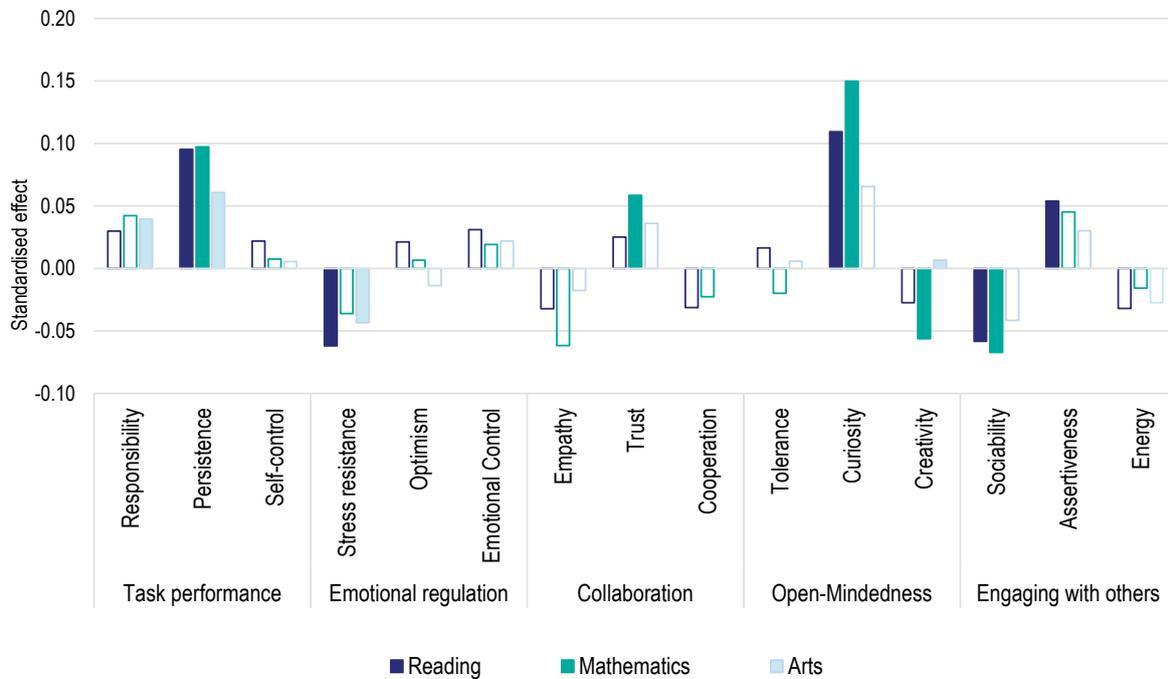
Meeting the cognitive, social and emotional needs of all learners

People need cognitive, social and emotional skills to prosper in today’s demanding and unpredictable world. Education and skills systems must enable learners to acquire the content knowledge required to participate in economies and political systems, but increasingly, they must also cultivate adaptable cognitive, social, and emotional skills that people need to respond to fast-changing environments and societal needs. Research is increasingly highlighting the importance of other, social and emotional skills that educational institutions, educators and communities need to foster in order to prepare individuals for a range of futures and improve their learning outcomes. Cognitive, social and emotional capacities are crucial for learning, but also for equitable participation in society. Within schools, social and emotional skills and academic skills support each other. The OECD’s Survey on Social and Emotional Skills (SSES) shows that social and emotional skills are strong predictors of academic achievement as well as psychological well-being (OECD, 2021^[100]) (Figure 10). Disadvantaged students who are socially and emotionally resilient also tend to do better academically. Conversely, academic resilience can promote social and emotional resilience. This applies equally to general and vocational education – with learners from the latter increasingly requiring strong cognitive, social and emotional skills to complement their job-specific or technical skills to navigate a changing labour market. Beyond school, career ambitions, job performance and other outcomes have been linked to certain social and emotional skills, like curiosity and emotional regulation (OECD, 2021^[100]). Socio-emotional skills are also strong predictors of life satisfaction, help reduce antisocial behaviour (e.g. crime), and enable individuals to be flexible and adapt to constantly evolving economies and societies (OECD, forthcoming^[74]).

Cognitive, social and emotional, and self-regulatory skills grow together during early childhood, with gains in one area contributing to concurrent and future growth in other areas. The International Early Learning and Child Well-being Study that looked at how children are faring at five years of age in three countries (England [United Kingdom], Estonia and the United States) found that children from high socio-economic backgrounds had higher levels of skills than children from low socio-economic backgrounds across almost all learning domains in the study (OECD, 2020^[20]). Equitable participation in high-quality early childhood education and care supports children’s development in all of these areas, with implications for learning beyond early childhood.

Figure 10. Average relationship between social and emotional skills and school performance of 15-year-olds

Coefficients of (standardised) grades in reading, mathematics and arts on (standardised) scores on social and emotional skills scales (international average)



Notes: Data for Sintra (Portugal) did not reach student response rate standards and are not included in international averages. The regressions are site-specific and control for gender, socio-economic status, and scores in the cognitive ability test, with the exception of Houston (United States), where the cognitive ability test was not administered. Ottawa (Canada) is excluded from the analysis on school grades as students' grades were not available. Coloured bars represent significant differences in at least five cities, bars that are only outlined represent significant differences in fewer than five cities.

Source: (OECD, 2021_[100]), *Beyond Academic Learning: First Results from the Survey of Social and Emotional Skills*, <https://doi.org/10.1787/92a11084-en>.

Several factors in schools can support learners' cognitive, social and emotional needs. Explicitly fostering "social and emotional skills" in schools can improve students' psychological well-being, health-related outcomes and their academic skills. Teacher professional development and behaviour, whole-school approaches and community collaboration with families can all contribute to developing social and emotional skills, particularly for disadvantaged students. In Victoria, Australia, the Resilience, Rights and Respectful Relationships curriculum develops students' social and emotional skills and promotes student well-being through safe classrooms. It uses a whole-school approach through classroom practices, curriculum and school-wide policy (OECD, 2021_[100]). In Sweden, the Social and Emotional Training programme applies to children aged 6-16 (grades 1-9) and seeks to support students in developing their cognitive, social and emotional skills. Longitudinal studies show positive impacts on mental health, such as self-efficacy, contentment in school, and reductions in drug use and bullying (Belfield et al., 2015_[101]). The 4Rs Program (Reading, Writing, Respect and Resolution) in New York City, United States, addresses cognitive, social and emotional needs through targeted literacy and psycho-social development for children aged 5-11. Studies have found the 4Rs Program to be effective in reducing aggression compared to students in elementary schools without the programme (Belfield et al., 2015_[101]). Developing social and emotional skills is often a key part of effective prevention programmes for a range of emotional well-being concerns. This includes school-based prevention and intervention programmes to reduce and prevent

mental health issues among children and youth. Skills such as communication, problem solving, coping and insight building are important for building resilience in online and offline spaces (Burns and Gottschalk, 2019^[90]). Teachers and the school environment play an important role in detecting personal, health-related or social needs that may jeopardise learning and in making the connection with appropriate services (Riding et al., 2021^[102]). Resilience is another skill that can be cultivated in and outside school. Positive, strong relationships with adults can help promote this in all learners (Burns and Gottschalk, 2019^[90]). Resilience, in turn, can help bolster well-being as well as later life outcomes, like personal and professional prospects (OECD, 2021^[100]).

Meeting children's cognitive, social and emotional needs equitably requires confronting several challenges. First, socio-economically advantaged students report higher social and emotional skills than their socio-economically disadvantaged peers do (OECD, 2021^[100]). Advantaged students also report better relations with their teachers, which in turn affect academic outcomes, resilience and well-being. Second, social and emotional skills, as self-reported by youth, decline in adolescence and gender differences increase. Levels of creativity and curiosity were significantly lower among 15-year-olds compared to 10-year-olds, suggesting a decline in creativity as children enter adolescence. Additionally, girls reported larger declines in self-perceived social and emotional skills compared to boys schools (OECD, 2021^[100]). Third, adults' own social and emotional skills affect children's abilities to develop their own skills. Work stress, overload or weak understanding of social and emotional skills among teachers and school leaders negatively affect school climate and teaching of social and emotional skills to children. Inversely, positive classroom interactions and effective classroom organisation boost cognitive, social and emotional learning (OECD, 2018^[29]).

Re-thinking schools' organisation for better relevance, equity and inclusion

During the COVID-19 pandemic, the continuity of learning largely benefitted from agile institution-level support to educators, trainers, leadership capacity, collaboration among educators and trainers, communication channels with parents and learners, wise use of time and arrangements to support the most vulnerable learners. The impact of educators and trainers was all the more important the more they benefitted from pedagogical autonomy, collaborative networks, shared digital learning tools and institutional support to ensure their own well-being. This experience highlighted the importance of investing in the capacity of agents on the ground – learners, educators/trainers, institutional leaders – to ensure timely responses to emergencies that are adapted to local realities, in recognition of the heterogeneous conditions of educational institutions.

Across all education levels, the increasing diversity of learners, the growing focus on equity and whole-child development are changing the way educational and training institutions, teachers and trainers organise their work. Schools, school leaders and teachers need to adapt to varying demands and the context they face, and respond to learners' individual needs. This demands agility and flexibility, and a rethink of both the organisation of schools and training institutions, and the use of teachers' and trainers' time to personalise instruction, respond to new demands and adapt to changing circumstances. A strategy is to make time to support schools' continuous improvement through school-embedded and collaborative teacher professional learning rather than old-style professional development conferences and passive seminars. This involves structuring school activities so that professional learning time can be embedded in the regular, ongoing activities of the school, and the entire school community works together to build teachers' and the school's capacity over time, in line with local needs. It also comprises openness to external monitoring, guidance and support. Investing in teachers' ability to engage in professional collaboration and in the ability of school leaders to facilitate and lead such collaborative effort is likely to be important to educational innovation at the school level (OECD, forthcoming^[103]). Some countries include space for collaborative planning in teachers' timetable allocation as part of policy measures in recognition of the extra workload reforms impose on implementation actors. Another avenue is to grant schools more discretion in the management of individual teachers' tasks and teaching commitments to use individuals'

talents and skills more flexibly to address local needs. The rationale is to enable a more efficient use of teachers' time. This could benefit from delegating some non-instruction tasks to other professionals (pedagogical support staff and administrative staff) to help teachers focus on the activities that have the greatest positive impact on student learning (OECD, 2019^[54]) and shape a well-developed teacher professional identity (Suarez and McGrath, 2022^[104]).

School leaders play a pivotal role in establishing an effective internal organisation of their schools to achieve the individual learning goals of all students. Long-standing research has stressed the importance of pedagogical leadership in particular, that is, of creating the environments in which teachers continuously improve their competencies to support student learning. Sufficient levels of autonomy for school leaders can enhance their ability to engage in pedagogical leadership while control over resource allocation decisions can have positive effects on student outcomes in specific contexts, provided that school leaders possess sufficient managerial and leadership capacity, and adequate accountability and support mechanisms are in place. Studies drawing on time-use data find that some forms of pedagogical leadership are more effective than others. The time principals spend on teacher coaching, evaluation, and developing the school's educational programme, for example, seems associated with achievement gains (OECD, 2019^[54]).

In addition, strengthening school leaders' and teachers' capacity to foster linkages with parents and the wider school community is critical to ensuring that their views are taken into account and to mobilising them in achieving the schools' goals for learners. This became apparent during the COVID-19 pandemic when parents played a critical role in facilitating their children's learning as education shifted online. Some countries have acknowledged this and provided guidelines to parents on how to help their children maximise the benefits and minimise the risks associated with digital technologies (OECD, forthcoming^[74]). The Office of Educational Technology in the United States, for example, prepared a Parent and Family Digital Learning Guide to support parents in helping their children thrive in digital education (US Office of Educational Technology, 2021^[105]). Digital technologies have also opened new channels for teachers to interact with the wider school community and have been shown to enhance the effectiveness of teacher-student and school-parent communication at relatively low costs (Escueta et al., 2020^[106]). To help parents, Ireland's strategy to combat educational disadvantage includes family literacy initiatives and a home-school-community liaison scheme that aims to improve the outcomes of young people by empowering an adult in their lives (OECD, 2021^[6]). Also, in vocational education and training, ensuring schools, teachers and trainers collaborate and interact with employers is essential to keep up to date with the realities of the workplace, better respond to evolving needs in the labour market, create equal opportunities for work-based learning and provide schools with adequate resources for practical training.

Fostering safe and supportive learning environments that strengthen learners' sense of belonging

Fostering safe, supportive and inclusive environments for all learners is key to increasing their sense of belonging and fostering their socio-emotional and academic well-being (OECD, 2019^[19]). Sense of belonging at school reflects how accepted, respected and supported students feel in their social context at school. A wide array of academic and social outcomes has been associated with higher sense of belonging, such as higher academic motivation, self-esteem and achievement (OECD, 2018^[43]). Moreover, students who feel they belong at school are less likely to engage in risky and antisocial behaviours, to be truant, drop out of school, and to be unsatisfied with their lives. Some student groups are less likely to display high levels of sense of belonging in schools for a variety of reasons. Overall, socio-economically disadvantaged students report lower sense of belonging than advantaged students in almost every education system that participates in PISA (OECD, 2019^[19]). Similarly, in a third of participating education systems, students with an immigrant background report a weaker sense of belonging. For refugee children specifically, challenges frequently include negative stereotypes and discrimination. Learners that suffer from these forms of social exclusion experience a range of repercussions such as distrust, hopelessness

and problematic behaviour, as well as negative long-term attitudes about schooling and their own potential. Positive school climate has also been linked to lower bullying prevalence. According to PISA, students who attend schools with a high prevalence of bullying are more likely to feel a weaker sense of belonging, a poorer disciplinary climate and less co-operation with their schoolmates than those in schools with a low prevalence of bullying (OECD, 2019_[19]). Similar issues concern LGBTQI+ students, for whom schools are less safe environments than for their peers (Mezzanotte, 2022_[36]). Bullying of these students has been identified as a common issue in numerous countries around the world.

As educators and role models, teachers have an important role in fostering the development of a positive school climate. Through their role as mentors and learning facilitators, teachers can contribute to raising learners' self-esteem, motivation and emotional stability. A first important factor is teacher support, meaning how willing they are to help students. A second important factor is trusting and strong student-teacher relationships. Respecting students' point of view and decision-making capabilities, being supportive, enthusiastic and responsive, and cooperating by exchanging ideas and best practices (OECD, 2019_[19]) are all aspects that can help teachers and school leaders build school climates that encourage healthy behavioural norms.

A holistic approach to fostering safe and supportive learning environments also requires a framework at the system level to promote learners' well-being and prevent, recognise and address transgressive behaviours such as bullying and violence. In Denmark, municipalities, schools and teachers use the results of the national well-being survey for students in primary and lower secondary schools – with questions on bullying, the disciplinary climate of classrooms and other related topics – to improve the learning environment (OECD, 2021_[6]). In New Brunswick (Canada), children and youth take part every three years in a wellness survey, which examines student perceptions, attitudes, and behaviours in areas related to personal well-being and consistently yields positive results (New Brunswick Health Council, 2019_[107]). In addition, collective action in individual schools typically involves the establishment of the school's climate vision, the promotion of positive interpersonal relationships within the school, inclusive teaching and learning practices, and the regular monitoring and evaluation of the school climate. In Portugal, as part of the School without Bullying, School without Violence plan, schools define an action plan involving strategies and activities that raise awareness around harmful behaviours and promote early identification. Schools can apply to have their practices in this area certified by submitting a report of their annual activities to the Ministry of Education, which allows the dissemination of best practices (OECD, 2021_[6]). As they promote safe, supportive and inclusive environments for all learners, education and skills systems are also fostering sense of belonging of individuals to their communities. This results from the development of citizenship skills and attitudes and values such as respect and tolerance for diversity, openness to different perspectives and awareness of different cultures, which contribute to more equitable and inclusive societies.

Digital technologies also bring their own specific risks to children's well-being and safety. Children who are vulnerable offline are also more likely to be vulnerable in the digital environment and are more likely to report harm resulting from digital risks. Factors that make children more vulnerable to these risks include personality factors (such as low self-esteem, psychological difficulties and sensation-seeking), social factors (such as lack of parental support, peer norms) and digital factors (such as specific digital practices and skills). Certain groups of children may be more at risk of experiencing digital risks like cyberbullying. This includes children who identify as LGBTQI+ and those with special education needs (Gottschalk, 2022_[108]). Schools and early childhood education and care settings can contribute to students' risk resilience in a number of ways. In some countries, digital skills, online ethics and safety learning opportunities are systematically fostered and are being integrated into curricula (Gottschalk, forthcoming_[89]). For example, Finland incorporates digital literacy into its national curriculum as one of the seven key competencies (Lähdemäki, 2019_[109]). In several states in the United States (California, Connecticut, New Mexico, Rhode Island and Washington), components of digital literacy are integrated into the state curriculum, including Internet safety, digital citizenship and media literacy (Hasse et al.,

2019_[110]). The new curricular standards for technology also included objectives to prevent cyberbullying and hate speech. Other approaches include training for teachers on digital risks and their implications, better engaging with parents especially at an early age, fostering a zero-tolerance culture to behaviours such as cyberbullying, offering spaces for adult and peer mentoring so that students can discuss practical implications of digital engagement and improve their levels of empathy and self-control (Burns and Gottschalk, 2019_[90]).

Another increasing priority is the need to strengthen students' media literacy to ensure they learn how to navigate forms of disinformation and misinformation of the digital environment. As shown by PISA, there are large cross-country differences in students' capacity to distinguish fact from opinion (see Figure 4). Digital media literacy can help empower learners and enable them to take advantage of the opportunities presented by digital tools. It can help them recognise fact, opinion and fiction, promote engagement in societal discourse and build digital skills. By using effective teaching strategies and resources in the right way to provoke discussions of media representation, power structures, motivations and sources, teachers can empower students with the skills they need to be aware of, and recognise, false and misleading digital content (Hill, 2022_[111]).

Working Lunch

Theme: Education for Sustainable Development: New Policies for New Challenges

Sustainable development seeks to balance the economic, environmental, and social dimensions of development in a long-term and global perspective. It implies a broad view of human welfare, a long-term perspective about the consequences of today's activities, and the full involvement of civil society to reach viable solutions. In turn, education for sustainable development involves learning and educational activities that aim to empower individuals – through new knowledge, skills, attitudes and values – to become the central agents fostering sustainable development along dimensions such as sustainable production and consumption, greener net-zero economy, social cohesion, inter- and intra-generational equity and human rights. Education and skills systems are crucial to promoting an inclusive growth model that has as a key aim individuals' health and well-being, that is sustainable and respectful of the environment and that does so by harnessing the power of technology while moderating technology's negative consequences. Recognising the inter-related nature of social challenges, climate change, and digital transformation, the discussion key issues below focus on the role of education and skills in promoting environmental sustainability and supporting the green transition.

Key Issues

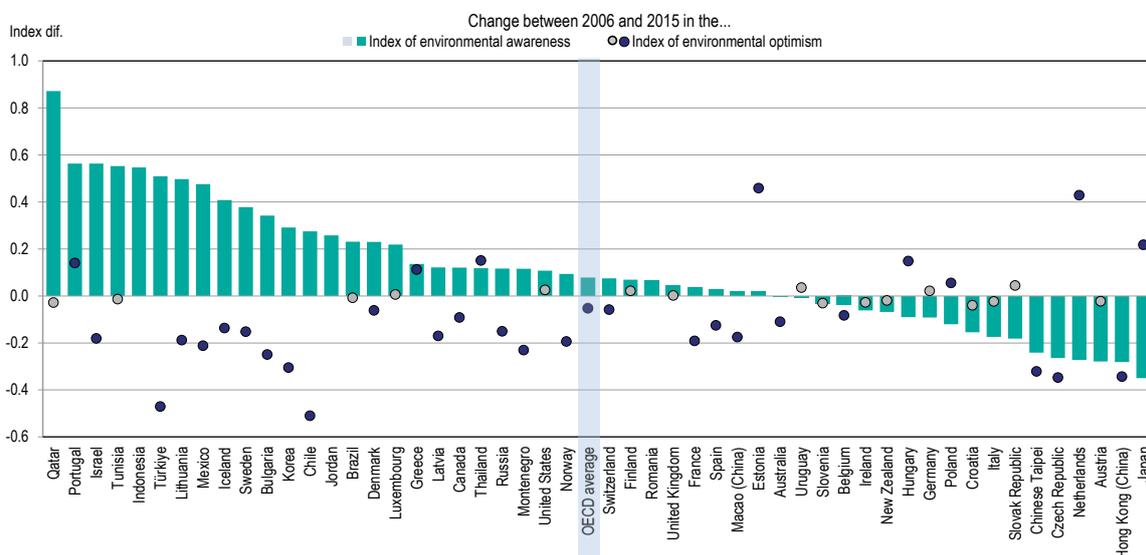
Learning to make responsible and well-informed choices for sustainable development

Climate change and other environmental challenges that our society faces today have potentially dramatic consequences (OECD, 2012^[112]). For example, estimates suggest that, compared to those born in the 1960s, children born in 2020 may experience 6.8 times more heatwaves across their lifetime (Luthen, Ryan and Wakefield, 2021^[113]). While building a sustainable society requires behavioural changes among the whole population and systemic changes to the structure of our economies, young people have an important role to play in addressing environmental challenges. PISA provides some indications on the extent to which young people are ready to play an active role in addressing environmental challenges. First, the great majority of 15-year-old students in most countries participating in PISA are proficient at some level of environmental science and geoscience. But proficiency is unevenly distributed across 15-year-olds. Students with immigrant and disadvantaged socio-economic backgrounds and girls, on average, showed significantly lower proficiency – a result with considerable cross-country variation (OECD, 2009^[114]). Students' attitudes regarding environmental issues also differ markedly by student socio-economic status. For example, 84% of socio-economically advantaged students reported knowing about or being very familiar with climate change and global warming while only 64% of disadvantaged students reported so, on average across countries and economies taking part in PISA 2018 (OECD, Forthcoming^[115]).

Second, students' environmental awareness had increased on average across OECD countries from 2006 to 2015, but students did not become more optimistic about resolving environmental problems over the same period (Figure 11). In general, environmentally aware students are more pessimistic about the future of the planet. For instance, on average, 15-year-old students who claimed to be informed about the

increase of greenhouse gases were 43% more likely to consider that this problem would get worse over the next 20 years than students who claimed not to be informed about this. While PISA cannot prove cause and effect, two factors showed a strong association with both awareness about environmental problems and a belief that these problems would be ameliorated over the next 20 years: the number of science activities in which students participate and students' exposure to enquiry-based teaching (Echazarra, 2018^[116]). Third, students have a high level of awareness, self-efficacy and interest in environmental issues and they take responsibility for these in their daily lives, but many students do not feel a sense of empowerment and agency to make a real difference. Students with positive environmental attitudes are more likely to take part in environmental actions even after accounting for academic achievement and other variables, yet many students with positive environmental attitudes are not involved in actions. For example, about 20% of students with awareness about climate change and global warming do not reduce the energy they use at home to protect the environment. This misalignment between environmental attitudes and actions is more pronounced among socio-economically disadvantaged students than among advantaged students. Environmental actions that require financial commitments are particularly difficult for students from disadvantaged families – which poses the question of how to enhance access for socio-economically disadvantaged families to environmentally sustainable products when the latter are more expensive than other products available in the market (OECD, Forthcoming^[115]). Raising awareness, building skills and developing a sense of agency are necessary pre-conditions to ensuring a shift towards a more environmentally sustainable economic paradigm but they are not sufficient conditions. Significantly reducing structural societal inequalities should accompany investments in skills if the green transition is to be a just one. Indeed there are indications that, across countries, support for climate policies hinges on three key factors: the perceived effectiveness of the policies in reducing emissions, their perceived distributional impacts on lower-income households (inequality concerns), and their own household's gains and losses (Dechezleprêtre et al., 2022^[117]).

Figure 11. Change between 2006 and 2015 in environmental awareness and optimism



Notes: Statistically significant changes between 2006 and 2015 are shown in darker tones. Lithuania acceded to the OECD on 5 July 2018. The OECD average does not include Lithuania. The indices of environmental awareness and optimism measure the extent to which students are knowledgeable and optimistic about environmental issues. They have been scaled using Item Response Theory and have an average of zero and a standard deviation of one across OECD countries.

Source: OECD (2018^[33]) PISA Database; (Echazarra, 2018^[116]), "Have 15-year-olds become "greener" over the years?", <https://doi.org/10.1787/6534cd38-en>.

Ensuring education and skills systems support individuals in adjusting to the green transition, particularly the most vulnerable

Climate change, alongside other adverse environmental conditions, threaten human health, economic prosperity, social cohesion but also human capital accumulation. What is more, the impacts of environmental degradation – on health, income and wealth, work and job quality, and safety – are concentrated among vulnerable groups and households (OECD, 2021^[118]). More specifically, the increasing occurrence of extreme weather events and overall higher temperatures reduce individuals' capacity to learn and to use their skills productively. Adverse environmental conditions have both direct and indirect effects on cognitive development that start in-utero and continue into old age. The effects on skills development and skills use of climate change are quantitatively important, widespread, and economically meaningful (Horvath and Borgonovi, 2022^[119]). Adverse environmental conditions have large distributional consequences, leading to widening disparities in educational opportunities both across countries and across socio-economic groups within countries. In the short-term, education policy can reduce the harmful effects of climate change on skills development through targeted mitigation strategies such as re-organising when and where learning occurs; investments in adaptive technologies and adequate infrastructure; and reorganising high-stakes exams to reduce inequalities.

In the longer term, reducing (and hopefully halting) the pace of climate change will require a transition towards a greener net-zero economy, with profound implications for labour markets and societies. The production and distribution of goods and services and consumption patterns will have to be radically changed as a result. Together with other policies, education and skills policies can improve both the pace with which the green transition can occur – reducing bottlenecks and skill shortages – but also reduce inequalities and distributional concerns due to short and medium-term job displacement. New jobs will emerge in some sectors, either to replace polluting activities with cleaner ones or to provide environmental services. Other jobs will be destroyed, mainly in carbon- and resource-intensive sectors (OECD, 2021^[120]). Existing evidence on energy and climate change policies suggests that, at the global level, job creation and destruction concentrate in low-skilled jobs, while net job gains accrue mostly to high- and medium-skilled labour (OECD, 2021^[120]). In addition to creating new jobs, which tend to emerge at higher skill levels, the green transition will also change existing jobs. The transition will therefore lead to a substantial change in skill demands among workers as well as new demands on all individuals as potential consumers. Of particular concern is the possibility that the interaction between the green and the digital transition may mean that, the impacts of these changes will not be felt equally across society and across countries. Without adequate interventions, these changes are likely to have larger effects on lower-income groups, certain segments of the population, developing countries, and countries and regions with strong dependence on the most affected sectors. For example, PISA 2018 results show that socio-economically advantaged students reported greater cognitive adaptability than disadvantaged students in all countries and economies with available data. Cognitive adaptability is the ability to adapt one's thinking and behaviour to the prevailing cultural environment or to novel situations and contexts that might present new demands or challenges.

Adjusting education and training systems, as well as training and qualification frameworks to build the necessary human capital will be key for a successful and equitable transition to a greener economy. This involves enabling young people to acquire skills for the green transition, training for new green jobs, upskilling and reskilling within existing jobs; and supporting workers, particularly those with lower skills, to make the leap from declining to emerging sectors. Vocational education and training is particularly well placed to develop and fast-track the technical and transversal skills needed in greener economies and societies (e.g. general environmental considerations as cross-cutting theme) – especially so when it integrates work-based learning opportunities. Similarly, in higher education, new programmes will need to emerge to prepare students for green jobs (e.g. climate change scientists; carbon trading analysts) and micro-credentials can play an important role in the upskilling and reskilling of the workforce (e.g. building facilities managers). This requires developing capacity among educators so they lead practical education

about sustainable development to empower learners to contribute to the green transition. Career guidance at all levels can also critically assist learners and workers in understanding new demands for green skills and inform them about growing, emerging, and declining sectors and jobs, available training options, and associated support mechanisms. In this context, in line with Sustainable Development Goal (SDG) target 4.7, the United Nations' Transforming Education Summit made a strong call for countries to integrate education for sustainable development with environmental and climate action into the core curriculum at all levels of education systems. For example, in 2020, Greece introduced education on climate change and sustainable development in the mandatory national curriculum for all students aged 4-15 with the creation of a new module titled Skills Labs, which focuses on the cultivation of soft, green, and digital skills. The environment is one of four thematic pillars and includes five topics: sustainable development; climate change; environmental consciousness; natural disasters prevention and protection; and cultural heritage (OECD, 2021^[6]). Similarly, in 2020, Italy introduced compulsory education on sustainable development in primary and secondary education through the Civic Education discipline, based on inter-ministerial collaboration on the Italian strategy for Education for Sustainable Development and the "School ReGeneration Plan". Overall, despite the paucity of data (measuring achievement of SDG target 4.7), early estimates suggest a great diversity of outcomes among OECD countries when it comes to education to promote sustainable development (OECD, 2022^[121]).

Session 3: Parallel Break-out sessions

Overall theme: Supporting learning throughout life for an inclusive and equitable society

The rapid pace of change in today's societies and the need to respond creatively to disruptions require flexible learning throughout life. This needs to be both lifelong – accessible to all at any age – and life-wide, promoting and recognising learning acquired outside of formal education systems. Lifelong learning starts in childhood and youth and continues throughout adulthood and old age. It involves formal learning in official settings like schools, higher education institutions or training centres, but also informal and non-formal learning (such as learning from co-workers and workplace training), and unintentional learning derived from spontaneous social interactions (OECD, 2021^[4]). Strengthening learning throughout life is key for all individuals, workers and citizens to adapt to changes in the world of work and in society. More importantly, ensuring equal opportunities to access quality education and training across all stages of life and all types of learning is essential to build inclusive and equitable societies. This involves developing strong foundations for lifelong learning, from birth through work and beyond; integrating the world of learning with the world of work, including the use of lifelong learning to protect the workers most vulnerable to the evolution of skill demand; and promoting the role of alternative credentials and providers in fostering inclusive lifelong learning and modernising education.

Theme 1: Foundations for lifelong learning, from birth through work and beyond

Key Issues

Building foundations for lifelong learning for all learners

Constant structural changes in the labour market, sudden disruptions and crises within society are increasing the need for individuals to be adaptable and learn throughout life. Participation in lifelong learning crucially depends on the provision of high-quality and relevant learning opportunities that are accessible and affordable to all learners. At the same time, ensuring a high-quality supply is not sufficient and systems must ensure that individuals develop from early on positive learning attitudes, maintain these and rely on these to engage meaningfully in learning opportunities that occur in a variety of settings. By developing strong foundational skills, education systems can build high levels of confidence and motivation without which individuals will not be able to play an active role in shaping their learning trajectories. A strong start through participation in high-quality early childhood education and care is essential for learning beyond early childhood, particularly for disadvantaged groups. Cognitive, social and emotional, and self-regulatory skills develop together during early childhood with durable effects throughout life.

As children mature and develop into young adults, their experiences during the final stages of schooling shape their first steps into the adult world. Upper secondary education – a few generations ago – the preserve of the minority, is now near universal in many OECD countries (OECD, 2021^[38]). Systems have

traditionally managed differences in individuals' preparedness for learning, interests and ambitions at this level by separating them into different groups or strands, potentially leading to further inequities among students (OECD, 2019^[37]) (OECD, 2021^[38]). For instance, some young people might follow vocational tracks that do not necessarily respond to their needs and, if no proper bridging or pathways exist between tracks, this may jeopardise their future learning opportunities. Yet, there are examples of countries organising this stage of education inclusively and flexibly so that individuals can be supported to tailor it to their needs. Norway is considering providing more flexible upper secondary education with no time limit – so that young people can take the time they need, sometimes more than others and sometimes less – for completion (Ministry of Education and Research, Norway, 2021^[122]). In Ireland, all students have the space to learn broadly, mature and develop in a Transition Year before the pressure of examinations (Department of Education, Ireland, 2022^[123]). New Zealand's National Certificate of Educational Achievement enables young people to choose subjects and courses flexibly, combining general and vocational content at different levels, tailored to their personal interests (Ministry of Education, New Zealand, 2022^[124]). Organising the final stage of school education with more flexible timeframes and modules also means it is more open to adults returning to education.

However, international comparisons indicate that many young people complete compulsory schooling with low levels of motivation and confidence in their abilities to learn and large disparities exist in the readiness of different groups. For example, evidence from PISA indicates that female students and students from disadvantaged socio-economic backgrounds often lack the confidence that is necessary to shape their future learning. More generally, how far upper secondary education enables learners to build effective foundations for the future differs across groups of students. For example, boys, students with parents with no higher education and immigrant students are at greater risk of not completing upper secondary education at all or of selecting pathways not providing equal opportunities in the labour market or in further education. According to the Survey of Adult Skills (PIAAC), more than 40% of those who left school before completing their upper secondary education have poor numeracy and literacy skills. In addition, too many young people leave education with little experience of the world of work. Less than 50% of students in vocational education and training programmes, and less than 40% of students in academic programmes in the 22 OECD countries and regions covered by the Survey of Adult Skills, participated in any kind of work-based learning (OECD, 2015^[125]).

A key issue is that students with greater social capital access the information they need while others are unable to capitalise on opportunities because they do not know how. Data repeatedly show that an individual's background – in terms of gender, socio-economic background, ethnic group, and geography – is associated with information asymmetries. Students from more disadvantaged backgrounds and lower achievers exhibit lower educational aspirations, feel less prepared to navigate the education and skills system and seize the opportunities it provides, and display greater concern in terms of their career readiness (OECD, 2021^[126]). This highlights the importance of career guidance to build young people's learning potential and ensure the school to after-school transition is an opportunity to develop their talents and pursue their aspirations. Many countries are taking action to enhance the quality of career guidance, utilising digital technologies to broaden access to employers, beginning provision in primary education and addressing inequalities within programmes. In Switzerland, career guidance is part of the curriculum from primary school, giving children the time to think about and plan the foundations that they will need to achieve their future ambitions. Hungary's online Career Orientation Measurement and Support Tool is in place in primary and secondary schools to assess students' competencies in science, technology, engineering, and mathematics (STEM) subjects and match them with career paths that suit their interests. Countries are also improving the quality of information available to prospective higher education students. For instance, the Slovak Republic has recently developed an online platform that gives prospective students access to data on the labour market outcomes of higher education graduates and allows them to compare different institutions and fields of study. Effective guidance is rich in first-hand encounters with employers, particularly during times when demand for skills is changing rapidly within the labour market,

and encourages continued investigation and reflection on potential futures in work. It also begins young, well before key transition points and is overseen by trained professionals.

Because they bring together all young people in a structured setting, schools are crucial to building young people's self-awareness and understanding of their own agency. Once young adults leave school it is far harder to engage them in a sustained way. Among young adults, participation in further learning crucially depends on the alignment between individuals' interests, abilities and labour market needs. Evidence from the Survey of Adult Skills (PIAAC) suggests that many adults fail to participate in formal, informal and non-formal learning opportunities because of lack of motivation, lack of belief in their own potential or lack of matching between available opportunities and their interests and needs. The individualisation of learning opportunities, which characterises effective adult learning, requires equal individualisation in the support provided through guidance and validation services that consider the heterogeneous backgrounds, prior experiences and needs of individuals in order to maximise the effectiveness of the services. Guidance and validation are important elements that allow matching individuals' needs with tailored, individualised, and holistic approaches for a wide range of services (counselling, guidance, mentoring and upskilling) considering individuals' situations, as well as stereotypes related to gender or other. In most cases, guidance and validation remain separate services at an organisational or institutional level. An integrated approach of guidance and validation of services contributes to better-informed individual career decisions. It allows for clearer and more tailored information to the specific individual's needs and goals in terms of education, training and labour market pathways. Creating a continuum between guidance and validation can increase the possibility of enabling and empowering individuals to build useful skills.

Creating equitable opportunities for learning throughout life, from birth through work and beyond

While it is important that individuals achieve a high level of foundational skills during early adulthood, there is also a need for education and skills systems to enable them to invest in lifelong learning to maintain, renew and update their skill levels. This will help them adapt to technological and social transformations already happening (OECD, 2021_[4]). Yet, evidence shows that access to learning opportunities throughout life are not equal across learners. Access to, and participation in, high-quality early childhood education and care varies by socio-economic, immigrant and ethnic background. During compulsory education, socio-economically disadvantaged students and students with an immigrant background generally underperform their peers (OECD, 2019_[37]). Non-immigrant students and advantaged students are more likely to complete upper secondary education and enrol in higher education (OECD, 2018_[127]; OECD, 2021_[38]). In addition, differences in skill levels – and in educational opportunities – related to socio-economic status permeate long after graduation from upper secondary education (OECD, 2021_[4]).

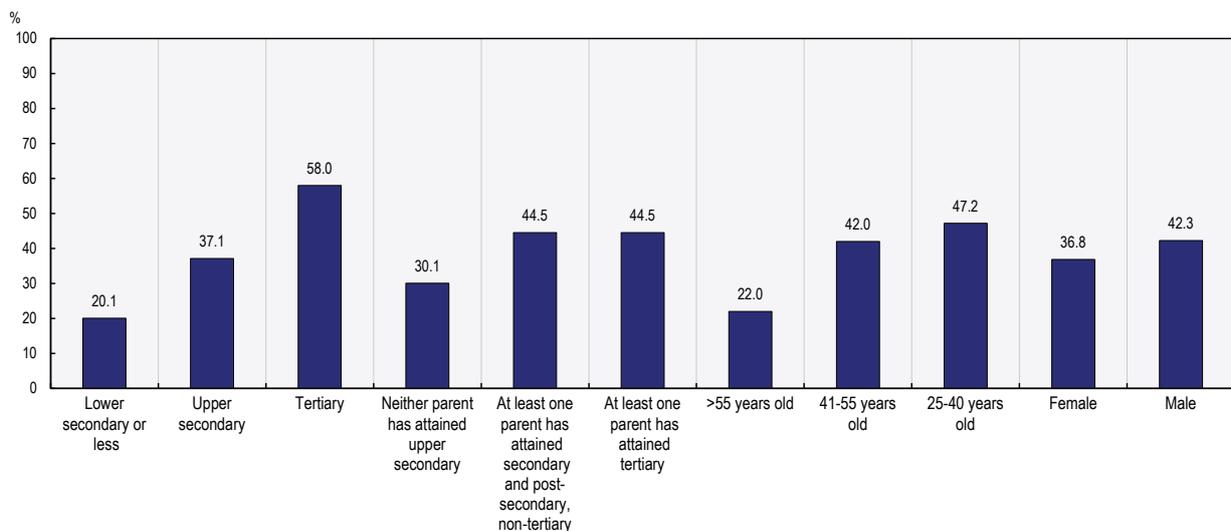
As individuals leave the formal education system, learning opportunities remain unequal. Older adults and adults with lower educational attainment and disadvantage (with neither parent attaining upper secondary education) have lower adult learning participation rates (Figure 12). Adults in greatest need, including many employed in professions at high risk of automation, are also less likely to make use of career guidance services (OECD, 2021_[128]). There are numerous reasons for the lack of participation in adult learning, which are more prevalent among disadvantaged adults. For many individuals, training opportunities are expensive. Many adults also feel too busy at work to seek more training or have family obligations (OECD, 2021_[4]). Individual characteristics, such as age, skill level and digital competencies can also partly explain why even those who are motivated to attend more training, fail to do so (OECD, 2021_[4]).

Education and skills systems need to recognise the heterogeneous nature of lifelong learning and lifelong learners. Lifelong learning occurs in formal, non-formal and informal settings. It involves individuals both young and old, with different experiences, motivations and attitudes. These differences influence not only whether and how people learn, but also their learning objectives. It is therefore essential to diversify the content and provision of learning, to account for the inherently heterogeneous nature of learning and

learners. However, heterogeneity in learners' profiles, learning objectives, socio-demographic characteristics, attitudes towards learning and learning goals should be managed so that it does not lead to a strong separation in learning pathways, with important risks to social cohesion and inclusiveness (OECD, 2021^[4]). In addition, education and skills systems need to empower learners to engage in lifelong learning. Policy making should build trust in lifelong learning, but also trust learners to make the right choices. It should be learner-centric, facilitating individuals' learning journeys and empowering them with initial skills and information that will allow them to define and continually update their learning paths (OECD, 2021^[4]).

Figure 12. Participation in adult learning, by socio-demographic characteristic

Percentage of 25-65 year-olds who reported participating in adult learning



Notes: Percentage of 25-65-year-olds who reported participating in at least one form of formal or non-formal adult learning opportunity for job-related reasons in the 12 months preceding the interview. Tertiary-level qualifications refer to International Standard Classification of Education (ISCED)-97 levels 5-6. Upper-secondary qualifications refer to ISCED-97 levels 3-4. Below upper-secondary level qualifications refer to ISCED-97 levels 1-2.

Source: (OECD, 2012, 2015, 2017^[34]), Survey of Adult Skills (PIAAC) (database 2012, 2015, 2019), <http://www.oecd.org/skills/piaac/publicdataandanalysis/>. In (OECD, 2021^[4]), *OECD Skills Outlook 2021: Learning for Life*, <https://doi.org/10.1787/0ae365b4-en>.

Equitable opportunities for learning throughout life build on high-quality early childhood education and care for all; strong foundational skills in compulsory education responding to the diverse needs of learners, including high-quality vocational pathways and flexibility to transition across education pathways; quality career guidance; and relevant higher-level education and adult learning opportunities. Overcoming the barriers to learning in adulthood is also critical, particularly for low-skilled and disadvantaged adults. Countries typically do this by creating flexible and shorter types of learning opportunities, improving the labour market relevance of adult learning and establishing recognition, validation and accreditation procedures, including for prior learning, to empower employees and make their skills both more visible and transferable (OECD, 2019^[8]) (OECD, 2021^[4]). This goes alongside a range of financial and social support to adult learners, incentives to employers, targeted information and guidance to help workers reskill and upskill as necessary and raise awareness of the returns to skills (OECD, 2019^[8]). Since 2016, for example, Portugal has developed the Qualifica Centres, a network of regional adult learning and career guidance centres to bring these services closer to target populations such as young people not in education, employment or training, and the unemployed. The Centres provide information, guidance, and training

plans and develop training in partnership with employers and education providers. The strategy has led to a large increase in the number of adults participating in training and gaining qualifications (OECD, 2021^[6]). Various countries are also making their vocational and education systems more flexible to respond to the needs of a diverse population of learners (including adults) and the needs of specific sectors. Finland, for example, implemented a modular approach in most vocational qualifications, designing a personalised learning plan for all learners and allowing them to acquire the required skills at vocational institutions, on the job or elsewhere. In Israel, the Starter Apprenticeship Programme targets unemployed adults and low-paid workers granting them opportunities to attend vocational training programmes with a strong work-based learning component in sectors of the economy with a high need of skills (Kuczera, Bastianić and Field, 2018^[129]). Also, young people in Slovenia can apply for scholarships to complete vocational programmes in fields with a shortage of skilled labour, such as carpentry, masonry, baking, and several bilingual vocational programmes (OECD, 2021^[6]).

An idea that has received considerable policy interest is that of an individual learning account. Such an account would allow individuals to accumulate training rights, carry them over between jobs and employment status, and promote individual investments in lifelong learning (OECD, 2019^[130]). France has an individual learning account policy permitting each participant a savings-like account in which accumulated credits can be used at any stage of the professional life. Created in 2015, the *Compte personnel de formation* (CPF) allows all labour force participants who are likely to change their job or their employment status to access training financed through a compulsory training levy on firms using their account credits (OECD, 2021^[131]). In 2020, Wales (United Kingdom) introduced the Personal Learning Accounts programme as part of the COVID-19 recovery plan. The programme gives workers earning below the medium income, along with furloughed or at-risk workers, the opportunity to retrain in high-demand fields. The courses are flexible, with part-time and distance-learning options, and are designed to fit around learners' existing responsibilities. During the first year of implementation, the programme offer was driven by the demands of the local economy. Before enrolling, applicants take part in a digital interview with an experienced careers advisor to discuss their career aspirations. This helps direct them towards reskilling opportunities that fit their aspirations and lifestyles and are likely to lead to employment. The initiative is funded by Wales' skills and jobs fund, a GBP 40 million package aimed at helping workers and the economy recover from the COVID-19 pandemic (OECD, 2021^[6]).

Finally, it is also important to create opportunities for lifelong learning beyond work. Because adult learning tends to be discussed in the framework of labour market needs, questions around meaning and accessibility of learning opportunities for senior citizens have traditionally been overlooked. Living longer entails changes in the meaning of old age. People now spend an increasing number of years in retirement. Seniors' learning needs thus go beyond those related to labour activity, for example in making healthy transitions from work into retirement. Importantly, regarding learning as part of an active and healthy ageing should not be at odds with the fact that older, frailer seniors often face situations of dependency, isolation and poor health. Supporting elders' access to learning opportunities should thus recognise the circumstances of the most elderly as well younger seniors (OECD, 2020^[132]).

Theme 2: Integrating the world of learning with the world of work

Key Issues

Promoting a whole-of-government and whole-of-society approach that better integrates learning and the world of work

Promoting a whole-of-government approach is imperative for facilitating smooth transitions between learning and the world of work and supporting lifelong learning. This is because, on the one hand, the

development of skills and their effective use in labour markets follows the “life course logic”, where individuals acquire and make use of skills as they move through the different stages of their educational and employment careers. On the other hand, each of these different stages is typically governed by different rules and regulations, overseen by different levels of government, as well as different public ministries and agencies. Co-ordination between ministries, between national and subnational authorities, and between subnational authorities themselves thus becomes crucial for better integrating learning and the world of work.

A whole-of-society approach involves engagement with social partners and other non-government stakeholders (e.g. education and training providers, the civil society, etc.) and helps policy makers to deal with the inherent complexities of policies that lie at the intersection of education and the labour market (OECD, 2019^[133]). Stakeholders can provide policy makers with valuable insights about the types of skills that education and skills systems should enable learners to develop to smoothly transition into the labour market, and about the real world effects of policies aiming to support such transitions. For instance, the Slovak Republic has introduced several measures to facilitate school-employers collaboration in vocational education and training. Since 2018, teachers working as educational counsellors in dual education have dedicated time to collaborate with employers. The government also created the position of ‘head instructor’ based in companies to improve collaboration with schools (OECD, 2021^[6]). In Türkiye, in 2021, the Ministries of National Education and of Industry and Technology signed a co-operation protocol to strengthen links between vocational institutions and Organised Industrial Zones (regional hubs that bring together representatives from different employment sectors). Each of these is now linked with at least one vocational provider and has a dedicated liaison office, each of which has a formal attachment with a teacher or training manager from each institution to facilitate institutional collaboration for curriculum planning (OECD, 2022^[134]). Also, in Poland, the 2011 reform of higher education introduced a three-month obligatory internship in practical programmes and mandated greater involvement of employers in curriculum design and the teaching process. At the same time, stakeholders (and particularly employers) play an important role in enriching career guidance and the provision of apprenticeships and employee learning. A number of countries are promoting a whole-of-government and whole-of-society approach through setting up cross-departmental bodies that also count on stakeholder participation (e.g. Skills Policy Council), and/or by using regulatory, financial, information, capacity building or other mechanisms to encourage stakeholders (especially employers) to become active partners in promoting lifelong learning, including in workplaces (OECD, 2021^[135]). For instance, in Canada, The Future Skills Council brings together representatives from public, private, labour, Indigenous and not-for-profit organisations to provide advice on emerging skills and workforce trends (OECD, 2021^[6]). An important part of the strategy is to monitor labour market trends and anticipate changes in the demand for skills. In Canada, the Labour Market Information Council has aimed to respond to a need for timely, local, and granular labour market data by prioritising collaboration with labour-market partners and developing several complementary approaches to data collection, such as surveys, linking administrative data, and modelling methods (Hofer, Zhivkovikj and Smyth, 2020^[136]).

The COVID-19 pandemic has underscored the value-added of a whole-of-government and whole-of-society approach. In order to implement timely responses to pressing challenges impacting both learning and the world of work, governmental actors needed to work together and explore diverse engagement modalities with stakeholders. The digital and green transitions magnify a number of inter-sectoral policy challenges (e.g. aligning learning to rapidly changing labour market needs, providing relevant learning opportunities for job-seekers, etc.), necessitating close collaboration and co-ordination across government and with stakeholders more than ever. In addition, the pandemic led to great innovation in training provision, which should be promoted also in the future. However, it is important for policy makers to identify successful programmes, develop information systems that help monitor the effectiveness of different initiatives, and promote strategies to bring successful initiatives to scale through continuous monitoring. Moreover, it is key to identify programmes that reach those at the greatest risk of faring poorly in the labour market because of a lack of skills and take into account the emergence of other ongoing trends.

Using lifelong learning to protect the workers most vulnerable to the evolution of skill demand

Lifelong learning is increasingly important for supporting the adaptation and resilience of workers in the context of rapidly changing skill demands. Digital technologies are transforming work, creating new occupations and eliminating others, and altering the skills requirements of existing jobs. Routine tasks associated with work in administration and production are being digitised and automated. At the same time, demand is growing for non-routine cognitive and advanced interpersonal skills that complement technology. Young people find themselves at particular risk as entry-level occupations are at particularly high risk of automation (Nedelkoska and Quintini, 2018^[137]). PISA 2018 shows moreover that two out of five fifteen-year-olds expect to work in an occupation that is at high risk of partial or full automation over the next decade (OECD, 2022^[138]). In addition, the green transition is changing how and what we produce, with knock-on effects for the skills that will be in demand in the labour market. The demographic transition, particularly increases in life expectancy and decreasing birth rates, are also creating pressure for adults to work longer, further increasing the need for workers to upskill to keep pace with change in existing jobs and to reskill to support transitions to new jobs. At the same time, the rise of the so-called ‘gig economy’ has resulted in increasing rates of temporary and part-time employment. Workers in such non-standard employment need opportunities to upgrade their skills, but lack the access to employer-sponsored training afforded to those in standard employment relationships. Finally, unforeseen events, such as pandemics and wars, can also reshape the skills needed in the labour market. The COVID-19 pandemic, for example, resulted in a mass transition to online work, accelerating the pace of the digital transition and making digital skills essential for a large share of the workforce (OECD, 2021^[4]). Low-skilled adults, who often also come from disadvantaged backgrounds, are more vulnerable to these current megatrends that affect the world of work (OECD, 2019^[46]).

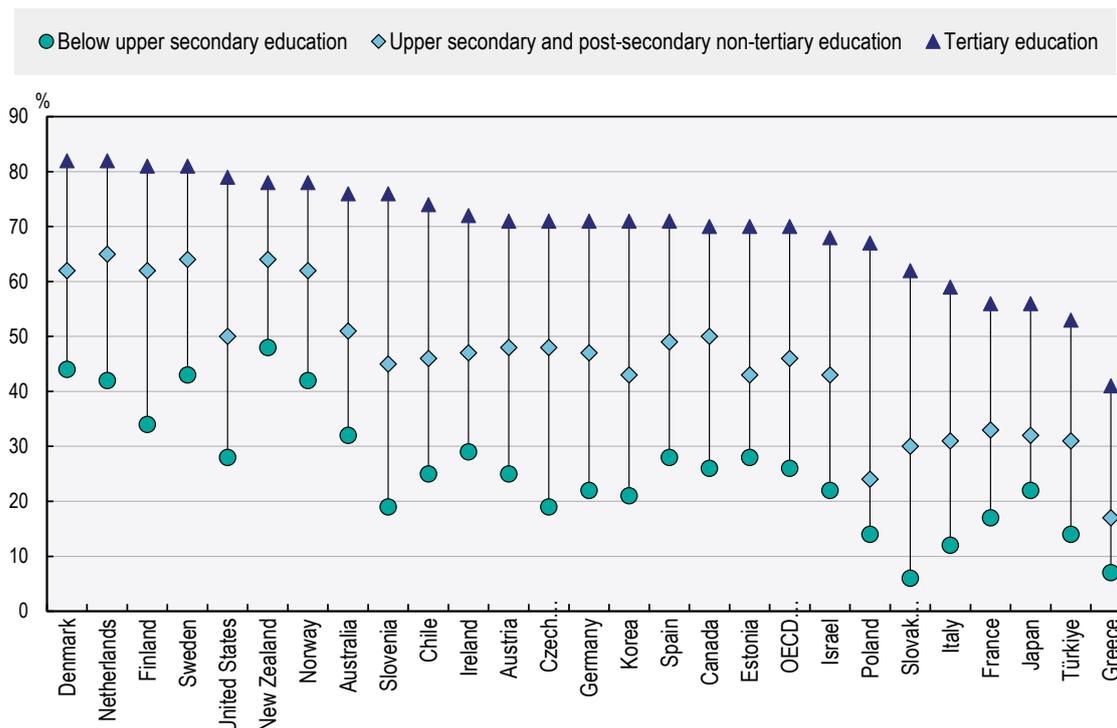
Despite the importance of ongoing learning throughout life for responding effectively to changing skills demand, participation rates in adult learning in many OECD countries are low. Data from the Survey of Adult Skills (PIAAC) indicate that only 2 in 5 adults (40%) on average had participated in job-related formal or non-formal training in the previous 12 months (OECD, 2022^[138]). Furthermore, those adults who might benefit most from education and training, such as those with low levels of education and skills, the long-term unemployed and those whose jobs are at high risk of automation are least likely to participate (Figure 13). Adults are more likely to participate in non-formal than formal training, as non-formal training is often shorter and more flexible and therefore easier to combine with other responsibilities adults have. However, formal programmes – particularly higher education and vocational education and training programmes – are more likely to provide valuable, quality-assured upskilling and reskilling opportunities leading to credentials recognised by employers and other education and training providers. Higher education institutions, often working in collaboration with educational technology firms, learning platforms, or industry bodies, are increasingly offering tailored, short programmes and micro-credentials in a bid to respond to demand for flexible, formalised upskilling and reskilling opportunities at advanced levels. In Ireland, for example, the Irish University Association, with support from the National Training Foundation, is developing a national approach to micro-credentials, including models for enterprise engagement, a national platform and a suite of learning offerings. In the Czech Republic, one of the priorities of the 2020 strategic plan for higher education is to increase the availability and relevance of flexible forms of learning, such as distance learning, and upskilling and reskilling courses. The government has created incentives for institutions to develop flexible learning options in areas of high demand in the labour market. It has also developed structures for institutions to collaborate and share best practices in work-based learning and blended learning (OECD, 2021^[6]).

A comprehensive approach is needed to raise the participation of vulnerable workers in lifelong learning and protect them from the potential adverse effects of the evolution of skill demand. Governments, employers, trade unions, and education and training providers need to work together to develop flexible on-the-job training opportunities, improve access to flexible formal education for adults, target support to

low-skilled and older workers, offer financial and social support for training, build employers' capacity to support the training of workers, and make it easier for workers to combine work and training. Greater recognition of skills acquired informally would help workers gain further qualifications and adapt their careers to changing needs (OECD, 2017^[23]) (OECD, 2019^[8]). A holistic approach to lifelong learning also requires supplemental programmes, such as income assistance programmes, to support the learning of the most vulnerable groups.

Figure 13. Participation in adult learning by level of education

Participation rate in formal and/or non-formal education, by education level, 16-65 year-olds, 2012/15



Notes: 1. The OECD average is based on the sample of OECD countries/regions assessed in the Survey of Adult Skills (PIAAC).

2. 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.

Source: (OECD, 2019^[133]) *OECD Skills Strategy 2019: Skills to Shape a Better Future*, <https://doi.org/10.1787/9789264313835-en>.

In Germany, the public employment agency supports training of low-skilled and older workers in SMEs through the WeGebAU programme. SMEs receive a 75% subsidy to cover the training costs of workers aged 45 and older, while micro enterprises with fewer than 10 employees receive a 100% subsidy. Evaluations of the programme have found that it helps participants increase their time spent in employment, although it has no effect on wages and the probability of future financial benefits. In Luxembourg, private-sector companies can receive training aid totalling up to 15% of the yearly amount invested in training; 35% of salaries of trained employees are paid by subsidies for certain workers, including those aged over 45. In Slovenia, the Comprehensive Support for Companies for Active Ageing of Employees Programme provides financial incentives for employers to prepare action plans and strategies to ensure better management of older (over 45) workers, as well as financial incentives for upskilling of older (over 45) workers. Capacity-building workshops are organised to build the competencies of human resource managers and CEOs in managing an ageing workforce. In Denmark, learners can

combine modules from different types of adult learning programmes (e.g. advanced management and leadership programmes; basic skills courses; higher education, vocational education and training; and non-formal liberal education programmes) to obtain a formal qualification. In the Flemish Community of Belgium, Centres for Adult Education provide education in a wide range of skills, including technical skills and languages. The courses are fully modular: the learner receives a partial certificate after completing a module and a formal certificate recognised by the Flemish Government after completing an entire programme. In Canada, federal funding is used to provide training and employment supports to individuals across Canada through bilateral Labour Market Transfer Agreements with provinces and territories. Training and supports, which are in part funded by these transfers, are designed and delivered by and in provinces and territories to respond to local labour market conditions and to provide better targeted supports to Canadians. For example, in the Canadian province of Ontario, the Second Career programme was introduced in 2015 to provide training assistance to older or long-tenured workers affected by economic restructuring, with the aim of helping them train for new careers in high-demand fields (OECD, 2021^[41]).

Theme 3: Alternative credentials and providers as drivers of inclusive lifelong learning and as an instrument to modernise education

Key Issues

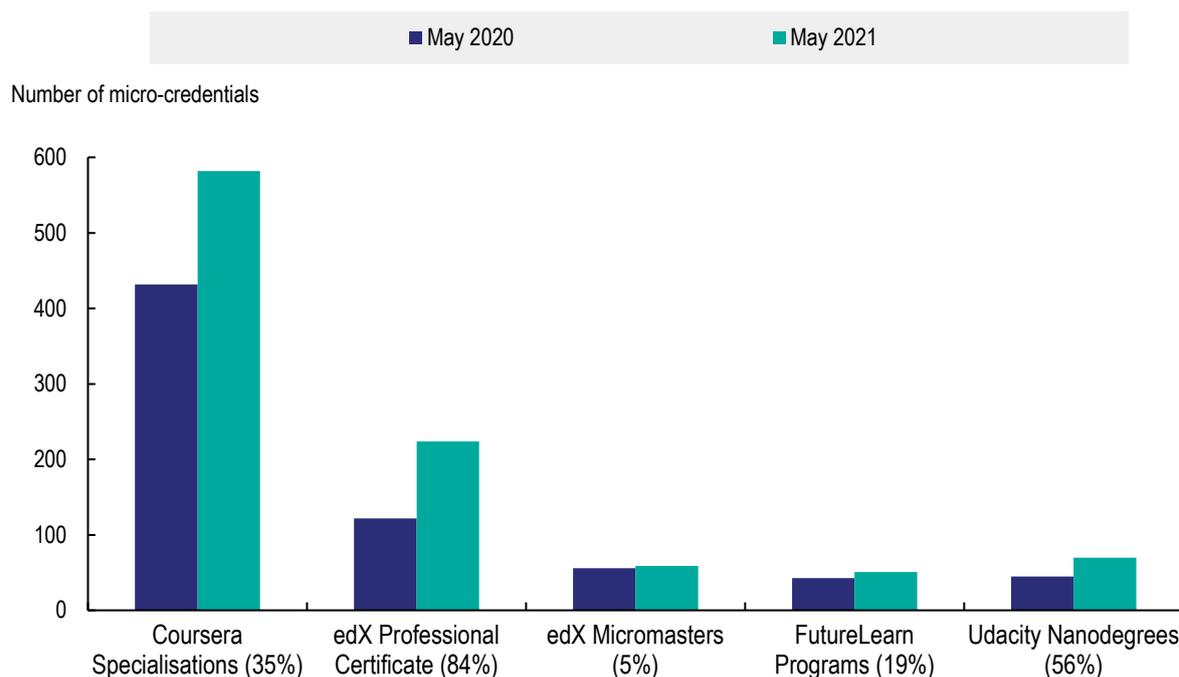
Promoting the role of alternative credentials in fostering lifelong learning and modernising education

Education institutions and alternative providers across the OECD are increasingly engaged in providing learners with new ways of gaining skills, and new ways of recognising the skills they have acquired – through a host of credentials other than traditional degrees – including certificates, badges, and micro-credentials. The last of these, micro-credentials, is taking on special importance in education and training systems, emerging as a new form of unbundled, credit-bearing, and stackable credentials. The number and diversity of micro-credential offerings have expanded substantially in recent years, accelerated by the onset of the COVID-19 pandemic. Between May 2020 and May 2021 the number of micro-credentials offered on some of the most popular platforms increased by as much as 80%, depending on the platform and specific type of micro-credential (Figure 14). Micro-credential providers include schools, higher education institutions, and private education and training providers. Providers also include specialised learning platforms, collaborative initiatives that focus on particular professions and occupations and a growing number of companies and professional associations that design their own competency-based offerings. Finally, public and non-profit bodies such as charities, government departments and international organisations may offer micro-credentials related to their missions (OECD, 2021^[139]). Micro-credentials are delivered through a range of different channels. Many micro-credentials are school- or campus-based. However, the increasing digital maturity of education institutions and other providers has increased their capacity and interest in offering micro-credentials wholly online, in order to reach a wider audience of potential students. At the same time, technological developments and cross-sector collaboration between providers are blurring the distinctions between different programme and provider types. As a result, the traditional, in-person, one-to-many relationship between education providers and learners is being gradually overturned, in favour of an ecosystem where novel connections between providers and learners are being formed, and interactions increasingly take place online (OECD, 2021^[139]).

Learners may enrol in micro-credential programmes as a stepping stone to achieving a degree, but may also do so for enjoyment, as a means to further an interest or a skill not related to their career, or in order to develop professionally (OECD, 2021^[139]). Micro-credentials delivered through shared digital learning

platforms offer learners some advantages over institution-led initiatives. Unlike programmes offered directly by individual institutions, online platforms allow learners to easily identify a large range of educational opportunities, often with social proof available from other learners who have completed the same programme. Potential learners can also directly compare and choose between micro-credentials across different providers, and in many cases can access the programmes immediately, creating maximum flexibility in learning pathways (OECD, 2021^[139]).

Figure 14. Number of micro-credentials offered on selected learning platforms, and one-year percentage change



Note: Figures in parentheses refer to an increase in the number of micro-credentials from May 2020 to May 2021.

Source: (OECD, 2021^[139]), "Micro-credential innovations in higher education: Who, What and Why?", <https://doi.org/10.1787/f14ef041-en>.

Governments see the value of micro-credentials in upskilling and reskilling the labour force, personal development and widening access to higher education and vocational education and training. Higher education institutions are faced with shrinking student cohorts and competitive pressures from new entrants to the learning marketplace, such as Google. Many have begun to view micro-credentials as a valuable complement to existing higher education offerings, and aim to develop micro-credentials either by building on their institution's existing offerings or by creating completely new offerings through partnerships with technology firms, global learning platforms, and industry or professional bodies that deliver targeted learning. Micro-credentials are also finding their way into the vocational education and training sector. In principle, educators can implement micro-credentials focusing on the development of transferable skills and job-related or discipline-specific skills. However, the modularisation of vocational education and training programmes that is needed to implement micro-credentials can be difficult, especially for practical learning activities that are part of apprenticeship programmes.

Micro-credentials have the advantage of speed – they can be rapidly developed and deployed, especially when delivered digitally. As a result, micro-credentials have the potential to permit rapid correction of minor

labour market imbalances (e.g. when a prospective employee is generally qualified for a role but has a deficit in one particular required skill). Moreover, micro-credentials can be useful for surfacing and signalling existing skills. Micro-credentials can also mitigate against the obsolescence of skills in many professions by providing professionals with the opportunity to continuously upskill in small amounts. Given their focus on the acquisition of specific skills, micro-credentials have also been characterised as a means of ‘disciplining’ the classification and framing of higher education and vocational education and training curricula to better align them with the requirements of the workplace. Also, if micro-credential programmes are co-created as partnerships among education institutions, professional bodies and industry, their learning content can simultaneously reflect both the latest research and professional best practices. Although higher education institutions still develop the majority of micro-credential programmes on online learning portals independently, an increasing tendency towards collaboration with industry can be observed. The United Kingdom-based Institute of Coding offers an example of a collaborative process that brings together diverse providers to design accessible and relevant courses and programmes in an area of high skills demand. The institute is a national consortium of employers, education providers and outreach organisations, financially supported by the United Kingdom government. To date, the Institute has created more than 150 programmes, spanning short courses, degrees and postgraduate programmes, and more than 900 000 learners have participated in the jointly developed courses and programmes. Through the involvement of outreach organisations, the initiative has been able to reach a wider and more diverse cohort of learners. An evaluation of the programme shows that 46% of the learners in the Institute of Coding programmes are women, compared to 16% in computer science courses in England. In addition, more than half of learners are over the age of 26.

If micro-credentials are to achieve fully their potential as a beneficially disruptive innovation in education, policy makers need to adapt the policy framework including funding arrangements, quality assurance, and certification and recognition of learning. In particular, two policy challenges must be addressed: equitable access and the recognition of micro-credentials by firms and educational institutions. There is a real risk that expanding micro-credential offerings will create a dynamic similar to other forms of lifelong learning, becoming primarily a means of accumulating educational advantage for some population groups rather than a tool for remediating missed opportunities for education and skill development. Education and skills policy makers will need to rethink how best to finance learners seeking to acquire micro-credentials, and redesign conventional student aid or active labour market policies to create funding options that are fit for purpose, including through tax systems or learning accounts. Moreover, policy makers and educators must reflect on how to address the needs of mature learners who lack foundational skills crucial for continued learning.

A basic potential benefit of micro-credentials is that they provide learners with a credential widely recognised by other education institutions, making them portable (from one provider to another) and stackable into an academic degree. If digitally awarded – and stored using blockchain technology – the micro-credential is envisioned to be not only portable and stackable, but also a learner-owned and easily shareable qualification (OECD, 2021^[139]). However, the recognition of micro-credentials by employers and educational institutions will require policy innovation by educational authorities in quality assurance and in the recognition and validation of qualifications. If micro-credentials are to be widely understood and trusted credentials, employers and educational institutions will need greater clarity about the skills of those who hold these credentials – achieved through transparent and reliable assessments, and learning that is offered by quality assured providers. The assurance of quality, along with mapping to national qualification frameworks, will be key to ensuring that micro-credentials function as stackable and portable educational credentials.

Policy initiatives to incorporate micro-credentials within quality assurance and funding arrangements have begun in a few OECD member countries, and are under consideration in many other countries, and the European Commission has engaged in the development of a European approach to micro-credentials as a focus of its skills and digital education agendas. New Zealand has been one of the frontrunners in national

policymaking around micro-credentials. The New Zealand Qualifications Authority (NZQA) created a quality assurance system for micro-credentials in 2018, by defining them in specific regulations and setting their quality standards. The New Zealand Tertiary Education Commission started providing funding to higher education providers for the development and delivery of micro-credential programmes in 2019. Fees may be charged to learners, but a maximum ceiling per credit is specified in regulations. Recognition of micro-credentials by the NZQA requires of providers that they demonstrate their programmes do not duplicate existing higher education programmes, and address unmet skill needs in the labour market and society. The providers are also required to prove their capacity to deliver quality education. The new legislation also simplified the micro-credential approval process, allowing newly established Workforce Development Councils, as well as vocational education and training providers and others, to develop micro-credentials, and replace training schemes with such credentials (OECD, 2021^[131]).

Perhaps the most important step will be to encourage a wider scope of skills-based hiring on the part of employers, in which work experience – and skills-based recognition of learning – more often guide hiring decisions than degree qualifications. Collaboration among employers, foundations, and educators, such as in the *Skilled Through Alternative Routes* project in the United States, will be essential. The project aims to promote among employers recruitment procedures that focus on actual skills of people – developed on the job, through military service, in community college, or through other alternative routes – rather than formal qualifications (e.g. bachelor's degree). Such focus would contribute to upward economic mobility for hired candidates and ensure a significant pool of talent is properly matched to available jobs.

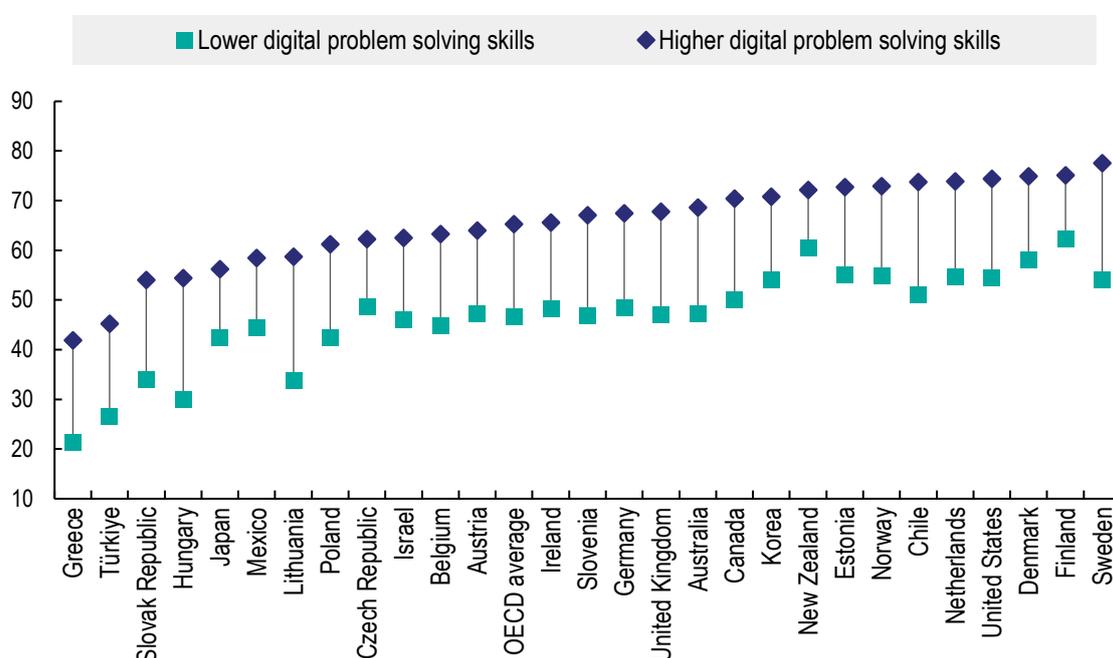
A final priority for policy makers is to promote further research on the effectiveness of micro-credentials, e.g. about their educational and labour market benefits. There is very limited evidence to date on the impact of micro-credentials, particularly those offered through digital learning platforms, and how it compares with the impact of other education and training programmes.

Unlocking the potential of alternative credentials to support lifelong learning among vulnerable workers

Alternative credentials, such as micro-credentials, offer the possibility of giving additional flexibility to individuals to adapt learning paths to their needs, fostering inclusion and employability in the labour market, and supporting job transitions. This might be particularly relevant to vulnerable workers who are more likely to be affected by the current megatrends that affect the world of work, such as technological change, globalisation and the rise of non-standard work (OECD, 2019^[46]). Many policy makers anticipate that responding to the reskilling and upskilling needs of vulnerable workers can best be accomplished by flexible and modularised ways of offering learning. The flexibility of micro-credentials could play an integral part in supporting smoother pivots and transitions in the labour market for adults employed in professions at high risk of automation. Micro-credentials can offer a way for learners to test a new subject or career field before committing to a job change or more comprehensive retraining, reducing the risk associated with career pivots.

However, learners who avail of non-formal education and training opportunities are unevenly distributed throughout the population. Participants in many forms of non-formal education and training are disproportionately drawn from groups of the population that already enjoy comparative labour market advantages, such as higher education graduates, males (in some fields), those with the means to fund expensive course fees, and those with financial or social support from employers (OECD, 2021^[131]). In addition, learners also need to have adequate skills to avail of the opportunities. Available evidence suggests that individuals with higher digital and information processing skills are more likely to participate in non-formal education and training than those with lower skills. For example, on average across OECD countries that participated in the Survey of Adult Skills (PIAAC), approximately 70% of adults with high digital problem solving skills participated in non-formal education and training in the previous 12 months, while less than half of those with low digital problem-solving skills did so (Figure 15) (OECD, 2021^[139]).

Figure 15. Participation in non-formal education and training, by level of digital problem-solving skills (2012, 2015 or 2018)



Notes: Participation in non-formal education and training during the previous 12 months.

Digital problem solving refers to problem solving in technology-rich environment as assessed in the Survey of Adult Skills (PIAAC). Proficiency in this domain is measured in four levels (below level 1 to level 3). Individuals who reach level 2 or 3 of the PIAAC proficiency scale are labelled as ones with "higher" skills, while those scored level 1 or below are categorised as ones with "lower" skills.

The United Kingdom: Data refers to England and Northern Ireland. Belgium: Data refers to the Flemish Community.

Each country or economy participated in one (or two) of the three rounds of PIAAC in 2012, 2015 or 2018.

Source: (OECD, 2021_[139]), "Micro-credential innovations in higher education: Who, What and Why?", <https://doi.org/10.1787/f14ef041-en>.

To harness the strengths of micro-credentials (i.e. their short, targeted and flexible nature) to support lifelong learning among vulnerable workers, governments will need to actively design micro-credential policies to support inclusion, as well as labour-market relevance. Policy options that appear promising include: targeted funding to support vulnerable workers to engage in modularised ways of learning; incentives for alternative, higher education and vocational education and training providers to facilitate the participation of non-traditional learners, such as care-giving parents or working adults; partnerships with employers to prioritise alternative credentials for vulnerable workers; and the creation of information portals for learners, to allow them to compare options and report on their experience with micro-credential platforms (OECD, 2021_[131]). Another key priority to ensure vulnerable workers fully benefit from the potential of alternative credentials is to invest in their digital skills. This should go alongside encouraging employers to give greater importance to skills-based assessment and recognition of prior learning in their hiring decisions.

Micro-credentials are already being used to support newly unemployed workers return swiftly to work. These programmes generally form part of a wider support package, allowing unemployed workers to keep existing social benefits or benefit from additional supports while availing of the education opportunity (OECD, 2021_[131]). For example, the Danish Government has implemented several upskilling and reskilling measures to support laid-off workers during the pandemic. In June 2020, the government announced financial support to allow workers in need of upskilling and reskilling to take short job-oriented courses while keeping their entitlement to receive the unemployment benefits. Similarly, the Portuguese Government launched the "Skills 4 post-Covid - Skills for the Future" project in May 2020 as a response

to the pandemic to encourage higher education institutions to create micro-credential programmes that help young graduates who have trouble entering the labour market and laid-off workers to develop specialised skills that are highly demanded in the labour market. The Government of Ontario (Canada) announced a significant investment in the development of micro-credentials in November 2020, with the aim of supporting individuals whose employment has been affected by the COVID-19 pandemic. It provides funding to postsecondary education institutions for the development of new micro-credential programmes that respond to regional labour market needs and facilitate collaboration with employers. It also offers learners financial assistance to take micro-credential programmes through the Ontario Student Assistance Programme or the Second Career Programme. In addition, it provides an online portal that lists micro-credential programmes to inform individuals who are in need of upskilling and reskilling. Also, the Government of Japan established a significant fund for the fiscal year 2021 to support several projects that aim to strengthen lifelong learning provision. One of the projects supports higher education institutions to develop and offer short programmes that target individuals who are unemployed or hold temporary contracts. These programmes focus on the fields where labour market demand is high, such as information technology (IT) and healthcare, are designed in collaboration with local employment offices and businesses, and are offered in a flexible manner (in terms of schedule and delivery modes) (OECD, 2021^[131]).

Consideration could also be given by governments to designing micro-credential programmes specifically to address more structural labour force challenges (for example, young people not in education, employment or training and long-term unemployment), to support broader access to higher education among underrepresented groups of the population and to support the completion of degree programmes in vocational education and training, and higher education.

References

- Ahn, J., A. Pellicone and B. Butler (2014), *Open badges for education: what are the implications at the intersection of open systems and badging?*, <https://doi.org/10.3402/rlt.v22.23563>. [68]
- Algan, Y. (2018), "Trust and social capital", in Stiglitz, J., J. Fitoussi and M. Durand (eds.), *For Good Measure: Advancing Research on Well-being Metrics Beyond GDP*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264307278-12-en> (accessed on 10 January 2022). [16]
- Apergis, N. (2018), "Education and democracy: New evidence from 161 countries", *Economic Modelling* 71, pp. 59-67, <https://doi.org/10.1016/j.econmod.2017.12.001> (accessed on 24 January 2022). [12]
- Avvisati, F. et al. (2013), "Review of the Italian Strategy for Digital Schools", *OECD Education Working Papers*, No. 90, OECD Publishing, Paris, <https://doi.org/10.1787/5k487ntdbr44-en>. [92]
- Belfield, C. et al. (2015), *The Economic Value of Social and Emotional Learning*, Center for Benefit-Cost Studies in Education, Teachers College, Columbia University. [101]
- Bers, M., A. Strawhacker and A. Sullivan (2022), "The state of the field of computational thinking in early childhood education", *OECD Education Working Papers*, No. 274, OECD Publishing, Paris, <https://doi.org/10.1787/3354387a-en>. [61]
- Blanden, J., M. Doepke and J. Stuhler (2022), "Educational Inequality", *NBER Working Paper Series*, No. 29979, National Bureau of Economic Research, Cambridge, MA, <https://doi.org/10.3386/W29979>. [30]
- Bond, M. et al. (2020), "Mapping research in student engagement and educational technology in higher education: A systematic evidence map", *International Journal of Educational Technology in Higher Education*, Vol. 17/2, pp. 1-30, <https://doi.org/10.1186/S41239-019-0176-8>. [81]
- Borgonovi, F. and E. Andrieu (2020), "Bowling together by bowling alone: Social capital and COVID-19", *Social Science & Medicine*, Vol. 265, p. 113501, <https://doi.org/10.1016/j.socscimed.2020.113501>. [15]
- Bradley, S. and C. Green (eds.) (2020), *The Economics of Education - A Comprehensive Overview*, <https://www.elsevier.com/books/the-economics-of-education/bradley/978-0-12-815391-8> (accessed on 2 December 2021). [14]
- Broadband Commission for Sustainable Development's Working Group on Digital Learning (2021), *Connecting Learning Spaces: Possibilities for Hybrid Learning*, UNESCO, International Telecommunication Union, [71]

- <https://broadbandcommission.org/publication/connecting-learning-spaces/>.
- Bron, J. (2014), "What students want to learn? Involving students in negotiating the social studies classroom curriculum", *Journal of International Social Studies*, Vol. 4/1, pp. 3-16. [18]
- Brussino, O. and J. McBrien (2022), "Gender stereotypes in education: Policies and practices to address gender stereotyping across OECD education systems", *OECD Education Working Papers*, No. 271, OECD Publishing, Paris, <https://doi.org/10.1787/a46ae056-en>. [39]
- Burns, T. and F. Gottschalk (eds.) (2019), *Educating 21st Century Children: Emotional Well-being in the Digital Age*, Educational Research and Innovation, OECD Publishing, Paris, <https://doi.org/10.1787/b7f33425-en>. [90]
- Castelló-Climent, A. (2008), "On the distribution of education and democracy", *Journal of Development Economics*, Vol. 87/2, pp. 179-190, <https://doi.org/10.1016/J.JDEVECO.2007.10.006>. [13]
- Cedefop (2021), *Digital transitions in lifelong guidance: rethinking careers practitioner professionalism: a CareersNet expert collection.*, <http://data.europa.eu/doi/10.2801/539512>. [65]
- Cerna, L. (2019), "Refugee education: Integration models and practices in OECD countries", *OECD Education Working Papers*, No. 203, OECD Publishing, Paris, <https://doi.org/10.1787/a3251a00-en>. [91]
- Cerna, L. et al. (2019), "Strength through diversity's Spotlight Report for Sweden", *OECD Education Working Papers*, No. 194, OECD Publishing, Paris, <https://doi.org/10.1787/059ce467-en>. [99]
- Cerna, L. et al. (2021), "Promoting inclusive education for diverse societies: A conceptual framework", *OECD Education Working Papers*, No. 260, OECD Publishing, Paris, <https://doi.org/10.1787/94ab68c6-en>. [42]
- Conrad, D. (2022), "Accreditation and Recognition of Prior Learning in Higher Education", in *Handbook of Open, Distance and Digital Education*, Springer Singapore, Singapore, https://doi.org/10.1007/978-981-19-0351-9_44-1. [67]
- Cukurova, M., R. Luckin and A. Clark-Wilson (2018), "Creating the golden triangle of evidence-informed education technology with EDUCATE", *British Journal of Educational Technology*, Vol. 50/2, pp. 490-504, <https://doi.org/10.1111/bjet.12727>. [83]
- Damşa, C. et al. (2015), *Quality in Norwegian higher education: a review of the research on aspects affecting student learning*, Report 2015-24, NIFU Oslo. [79]
- Darling-Hammond, L. et al. (2019), "Implications for educational practice of the science of learning and development", *Applied Developmental Science*, Vol. 24/2, pp. 97-140, <https://doi.org/10.1080/10888691.2018.1537791>. [93]
- Dechezleprêtre, A. et al. (2022), "Fighting climate change: International attitudes toward climate policies", *OECD Economics Department Working Papers*, No. 1714, OECD Publishing, Paris, <https://doi.org/10.1787/3406f29a-en>. [117]
- Department of Education, Ireland (2022), *Minister Foley announces plan for reform of Senior Cycle education - Equity and Excellence for All*, <https://www.gov.ie/en/press-release/f7bf7-minister-foley-announces-plan-for-reform-of-senior-cycle-education-equity-and-excellence-for-> [123]

- [all/](#) (accessed on 9 August 2022).
- Echazarra, A. (2018), “Have 15-year-olds become “greener” over the years?”, *PISA in Focus*, No. 87, OECD Publishing, Paris, <https://doi.org/10.1787/6534cd38-en>. [116]
- Echazarra, A. and T. Radinger (2019), “Learning in rural schools: Insights from PISA, TALIS and the literature”, *OECD Education Working Papers*, No. 196, OECD Publishing, Paris, <https://doi.org/10.1787/8b1a5cb9-en>. [78]
- Escueta, M. et al. (2020), “Upgrading education with technology: Insights from experimental research”, *Journal of Economic Literature*, Vol. 58/4, pp. 897-996, <https://doi.org/10.1257/jel.20191507>. [106]
- European Commission/EACEA/Eurydice (2018), *Citizenship education at school in Europe 2017*, Publications Office of the European Union, Luxembourg, <https://doi.org/10.2797/536166>. [98]
- European Commission (2020), *Innovation and digitalisation: a report of the ET 2020 Working Group on Vocational Education and Training (VET): eight insights for pioneering new approaches*, Publications Office of the European Union, Luxembourg, <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8365>. [64]
- Golden, G. (2020), “Education policy evaluation: Surveying the OECD landscape”, *OECD Education Working Papers*, No. 236, OECD Publishing, Paris, <https://doi.org/10.1787/9f127490-en>. [27]
- Gottschalk, F. (2022), “Cyberbullying: An overview of research and policy in OECD countries”, *OECD Education Working Papers*, No. 270, OECD Publishing, Paris, <https://doi.org/10.1787/f60b492b-en>. [108]
- Gottschalk, F. (forthcoming), *Digital equity and inclusion in education: An overview of practice and policy in OECD countries*, OECD. [89]
- Hannon, V. et al. (2019), *Local Learning Ecosystems: Emerging Models*, Qatar Foundation, WISE, Innovation Unit, <https://www.wise-qatar.org/2019-wise-research-learning-ecosystems-innovation-unit>. [73]
- Hasse, A. et al. (2019), *Youth and Cyberbullying: Another Look*, <https://cyber.harvard.edu/publication/2019/youth-and-cyberbullying/another-look> (accessed on June 2021). [110]
- Hill, J. (2022), “Policy responses to false and misleading digital content: A snapshot of children’s media literacy”, *OECD Education Working Papers*, No. 275, OECD Publishing, Paris, <https://doi.org/10.1787/1104143e-en>. [111]
- Hofer, A., A. Zhivkovikj and R. Smyth (2020), “The role of labour market information in guiding educational and occupational choices”, *OECD Education Working Papers*, No. 229, OECD Publishing, Paris, <https://doi.org/10.1787/59bbac06-en>. [136]
- Horvath, D. and F. Borgonovi (2022), “Global warming, pollution and cognitive developments: The effects of high pollution and temperature levels on cognitive ability throughout the life course”, *Social, Employment and Migration Working Papers*, No. No. 26, OECD Publishing, Paris. [119]
- Jackson, C. (2018), *Does School Spending Matter? The New Literature on an Old Question*, [48]

- National Bureau of Economic Research, Cambridge, MA, <https://doi.org/10.3386/w25368>.
- Jensen, B. and J. Farmer (2013), *School Turnaround in Shanghai: The Empowered-Management Program Approach to Improving School Performance*, [57]
<https://www.americanprogress.org/issues/education-k-12/reports/2013/05/14/63144/school-turnaround-in-shanghai>.
- Kato, S., V. Galán-Muros and T. Weko (2020), “The emergence of alternative credentials”, *OECD Education Working Papers*, No. 216, OECD Publishing, Paris, [72]
<https://doi.org/10.1787/b741f39e-en>.
- Kis, V. (2016), “Work-based Learning for Youth at Risk: Getting Employers on Board”, *OECD Education Working Papers*, No. 150, OECD Publishing, Paris, [44]
<https://doi.org/10.1787/5e122a91-en>.
- Kuczera, M., T. Bastianić and S. Field (2018), *Apprenticeship and Vocational Education and Training in Israel*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, [129]
<https://doi.org/10.1787/9789264302051-en>.
- Lähdemäki, J. (2019), “Case Study: The Finnish National Curriculum 2016 - A Co-created National Education Policy”, in Cook, J. (ed.), *Sustainability, Human Well-Being, and the Future of Education*, Palgrave Macmillan, Cham, [109]
https://doi.org/10.1007/978-3-319-78580-6_13.
- Lochner, L. (2011), “Nonproduction Benefits of Education: Crime, Health, and Good Citizenship”, *Handbook of the Economics of Education*, Vol. 4, pp. 183-282, [111]
<https://doi.org/10.1016/B978-0-444-53444-6.00002-X>.
- Loureiro, A. et al. (2020), *The State of Ceará in Brazil is a Role Model for Reducing Learning Poverty*, World Bank, Washington, DC, [55]
<https://doi.org/10.1596/34156>.
- Luthen, S., E. Ryan and J. Wakefield (2021), *Born into the Climate Crisis: Why we must act now to secure children’s rights*, Save the Children International, [113]
https://resourcecentre.savethechildren.net/document/born-climate-crisis-why-we-must-act-now-secure-childrens-rights/?_ga=2.119861192.1104409156.1665937376-1972056707.1665937374.
- Mezzanotte, C. (2022), “The social and economic rationale of inclusive education : An overview of the outcomes in education for diverse groups of students”, *OECD Education Working Papers*, No. 263, OECD Publishing, Paris, [36]
<https://doi.org/10.1787/bff7a85d-en>.
- Minea-Pic, A. (2020), “Innovating teachers’ professional learning through digital technologies”, *OECD Education Working Papers*, No. 237, OECD Publishing, Paris, [62]
<https://doi.org/10.1787/3329fae9-en>.
- Ministère de l’Éducation Nationale et de la Jeunesse (2018), *L’éducation nationale engagée en faveur d’une école rurale de qualité [National education engaged for high-quality rural schooling]*, <https://www.education.gouv.fr/rentree-2018-l-education-nationale-engagee-en-faveur-d-une-ecole-rurale-de-qualite-8375> (accessed on 26 July 2022). [77]
- Ministry of Education and Research, Norway (2021), *Completion reform - with open doors to the world and the future*, Ministry of Education and Research, Norway, [122]
<https://www.regjeringen.no/no/dokumenter/meld.-st.-21-20202021/id2840771/?ch=1>
 (accessed on 9 August 2022).

- Ministry of Education, New Zealand (2022), *National Certificate of Educational Achievement (NCEA)*, <https://www.nzqa.govt.nz/ncea/> (accessed on 16 April 2021). [124]
- Mostafa, T. (2020), "Do all students have equal opportunities to learn global and intercultural skills at school?", *PISA in Focus*, No. 109, OECD Publishing, Paris, <https://doi.org/10.1787/2fdce668-en>. [97]
- National Academies of Sciences, Engineering, and Medicine (2018), *How People Learn II: Learners, Contexts, and Cultures*, The National Academies Press, Washington, D.C., <https://doi.org/10.17226/24783>. [58]
- Nedelkoska, L. and G. Quintini (2018), "Automation, skills use and training", *OECD Social, Employment and Migration Working Papers*, No. 202, OECD Publishing, Paris, <https://doi.org/10.1787/2e2f4eea-en>. [137]
- New Brunswick Health Council (2019), *New Brunswick 2018–2019 student wellness survey—Grades 6-12.*, <https://nbhc.ca/all-publications/nbsws-grades-6-12-2018-2019> (accessed on 21 September 2020). [107]
- NIFU (2019), *Ressursinnsatsen til FoU innenfor tematiske områder i 2017*, <https://nifu.brage.unit.no/nifu-xmlui/bitstream/handle/11250/2619010/NIFUrapport2019-11.pdf> (accessed on 22 June 2022). [25]
- NSW Department of Education (2019), "Service Need and Alignment Investment Logic Map (ILM)", https://education.nsw.gov.au/content/dam/main-education/en/home/about-us/strategies-and-reports/schools-digital-strategy/strategy-resources/documents/05_Schools_Digital_Strategy-Investment_Logic.pdf (accessed on 27 June 2022). [75]
- OCDE (2017), *Perspectives de l'OCDE sur les compétences 2017: Compétences et chaînes de valeur mondiales*, Éditions OCDE, Paris, <https://doi.org/10.1787/9789264203433-fr>. [140]
- OECD (2022), *Education Policy Outlook 2022: Transforming pathways for lifelong learners*, OECD Publishing, Paris, <https://doi.org/10.1787/c77c7a97-en>. [134]
- OECD (2022), *Meet the future: how employer gain from helping young people get career ready*, <https://issuu.com/oecd.publishing/docs/meet-the-future>. [138]
- OECD (2022), *Mending the Education Divide: Getting Strong Teachers to the Schools That Need Them Most*, TALIS, OECD Publishing, Paris, <https://doi.org/10.1787/92b75874-en>. [51]
- OECD (2022), "Sharing is caring: Opening knowledge through education and science", *Trends Shaping Education Spotlights*, No. 25, OECD Publishing, Paris, <https://doi.org/10.1787/e6d23b76-en>. [69]
- OECD (2022), *The Short and Winding Road to 2030: Measuring Distance to the SDG Targets*, OECD Publishing, Paris, <https://doi.org/10.1787/af4b630d-en>. [121]
- OECD (2022), *Value for Money in School Education: Smart investments, Quality outcomes, Equal opportunities (working title)*, OECD Publishing, Paris, <https://doi.org/10.1787/f6de8710-en>. [17]
- OECD (2022), *Who Cares about Using Education Research in Policy and Practice?: Strengthening Research Engagement*, OECD Publishing, Paris, [26]

- <https://doi.org/10.1787/d7ff793d-en>.
- OECD (2021), *21st-Century Readers: Developing Literacy Skills in a Digital World*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/a83d84cb-en>. [22]
- OECD (2021), *Adapting Curriculum to Bridge Equity Gaps: Towards an Inclusive Curriculum*, OECD Publishing, Paris, <https://doi.org/10.1787/6b49e118-en>. [94]
- OECD (2021), *Beyond Academic Learning: First Results from the Survey of Social and Emotional Skills*, OECD Publishing, Paris, <https://doi.org/10.1787/92a11084-en>. [100]
- OECD (2021), *Career Guidance for Adults in a Changing World of Work*, Getting Skills Right, OECD Publishing, Paris, <https://doi.org/10.1787/9a94bfad-en>. [128]
- OECD (2021), *Education at a Glance 2021: OECD Indicators*, OECD Publishing, Paris, <https://doi.org/10.1787/b35a14e5-en>. [38]
- OECD (2021), *Education Policy Outlook 2021: Shaping Responsive and Resilient Education in a Changing World*, OECD Publishing, Paris, <https://doi.org/10.1787/75e40a16-en>. [6]
- OECD (2021), *Embedding Values and Attitudes in Curriculum: Shaping a Better Future*, OECD Publishing, Paris, <https://doi.org/10.1787/aee2adcd-en>. [5]
- OECD (2021), *Implications of the COVID-19 Pandemic for Vocational Education and Training*, OECD Publishing, Paris, <https://doi.org/10.1787/55afea00-en>. [35]
- OECD (2021), “Indicators of teenage career readiness: Guidance for policy makers”, *OECD Education Policy Perspectives*, No. 43, OECD Publishing, Paris, <https://doi.org/10.1787/6a80e0cc-en>. [126]
- OECD (2021), *International Migration Outlook 2021*, OECD Publishing, Paris, <https://doi.org/10.1787/29f23e9d-en>. [21]
- OECD (2021), “Making the most of teachers’ time”, *OECD Education Policy Perspectives*, No. 29, OECD Publishing, Paris, <https://doi.org/10.1787/d005c027-en>. [63]
- OECD (2021), “Micro-credential innovations in higher education : Who, What and Why?”, *OECD Education Policy Perspectives*, No. 39, OECD Publishing, Paris, <https://doi.org/10.1787/f14ef041-en>. [139]
- OECD (2021), *OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots*, OECD Publishing, Paris, <https://doi.org/10.1787/589b283f-en>. [60]
- OECD (2021), *OECD Skills Outlook 2021: Learning for Life*, OECD Publishing, Paris, <https://doi.org/10.1787/0ae365b4-en>. [4]
- OECD (2021), “Quality and value of micro-credentials in higher education: Preparing for the future”, *OECD Education Policy Perspectives*, No. 40, OECD Publishing, Paris, <https://doi.org/10.1787/9c4ad26d-en>. [131]
- OECD (2021), *Starting Strong VI: Supporting Meaningful Interactions in Early Childhood Education and Care*, Starting Strong, OECD Publishing, Paris, <https://doi.org/10.1787/f47a06ae-en>. [40]

- OECD (2021), "The inequalities-environment nexus: Towards a people-centred green transition", [118]
OECD Green Growth Papers, No. 2021/01, OECD Publishing, Paris,
<https://doi.org/10.1787/ca9d8479-en>.
- OECD (2021), *The State of School Education: One Year into the COVID Pandemic*, OECD [88]
 Publishing, Paris, <https://www.oecd-ilibrary.org/docserver/201dde84-en.pdf?expires=1632997342&id=id&accname=quest&checksum=AB7A563077A4309BB5207DC1BF8D8508> (accessed on 30 September 2021).
- OECD (2021), "Think green: Education and climate change", *Trends Shaping Education* [120]
Spotlights, No. 24, OECD Publishing, Paris, <https://doi.org/10.1787/2a9a1cdd-en>.
- OECD (2021), "Towards equity in school funding policies", *OECD Education Policy Perspectives*, [49]
 No. 41, OECD Publishing, Paris, <https://www.oecd-ilibrary.org/docserver/6a3d127a-en.pdf?expires=1642414595&id=id&accname=ocid84004878&checksum=1D53BFCFBDA3E73EFAE8B747DF0587C1> (accessed on 17 January 2022).
- OECD (2021), *Training in Enterprises : New Evidence from 100 Case Studies, Getting Skills* [135]
Right, OECD Publishing, Paris, <https://doi.org/10.1787/7d63d210-en> (accessed on 27 July 2022).
- OECD (2020), *Back to the Future of Education: Four OECD Scenarios for Schooling*, Educational [132]
 Research and Innovation, OECD Publishing, Paris, <https://doi.org/10.1787/178ef527-en>.
- OECD (2020), "Curriculum (re)design: A series of thematic reports from the OECD Education [3]
 2030 project. Overview Brochure", <https://www.oecd.org/education/2030-project/contact/brochure-thematic-reports-on-curriculum-redesign.pdf>.
- OECD (2020), *Curriculum Overload: A Way Forward*, OECD Publishing, Paris, [9]
<https://doi.org/10.1787/3081ceca-en>.
- OECD (2020), *Early Learning and Child Well-being: A Study of Five-year-Olds in England, [20]
 Estonia, and the United States*, OECD Publishing, Paris, <https://doi.org/10.1787/3990407f-en>.
- OECD (2020), *PISA 2018 Results (Volume V): Effective Policies, Successful Schools*, PISA, [50]
 OECD Publishing, Paris, <https://doi.org/10.1787/ca768d40-en>.
- OECD (2020), *Resourcing Higher Education: Challenges, Choices and Consequences*, Higher [45]
 Education, OECD Publishing, Paris, <https://doi.org/10.1787/735e1f44-en>.
- OECD (2020), *What Students Learn Matters: Towards a 21st Century Curriculum*, OECD [10]
 Publishing, Paris, <https://doi.org/10.1787/d86d4d9a-en>.
- OECD (2019), *Getting Skills Right: Engaging low-skilled*, OECD, [46]
<https://www.oecd.org/els/emp/engaging-low-skilled-adults-2019.pdf>.
- OECD (2019), *Individual Learning Accounts : Panacea or Pandora's Box?*, OECD Publishing, [130]
 Paris, <https://doi.org/10.1787/203b21a8-en>.
- OECD (2019), *Knowledge for 2030: Conceptual Learning Framework*, OECD Future of Education [2]
 and Skills 2030, https://www.oecd.org/education/2030-project/teaching-and-learning/learning/knowledge/Knowledge_for_2030_concept_note.pdf.
- OECD (2019), *OECD Future of Education and Skills 2030: OECD Learning Compass 2030, a [1]
 Series of Concept Notes*, <https://www.oecd.org/education/2030->

[project/contact/OECD_Learning_Compass_2030_Concept_Note_Series.pdf](#).

- OECD (2019), *OECD Skills Outlook 2019: Thriving in a Digital World*, OECD Publishing, Paris, [8]
<https://doi.org/10.1787/df80bc12-en>.
- OECD (2019), *OECD Skills Strategy 2019: Skills to Shape a Better Future*, OECD Publishing, [133]
 Paris, <https://doi.org/10.1787/9789264313835-en>.
- OECD (2019), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, PISA, OECD [37]
 Publishing, Paris, <https://doi.org/10.1787/b5fd1b8f-en>.
- OECD (2019), *PISA 2018 Results (Volume III): What School Life Means for Students' Lives*, [19]
 PISA, OECD Publishing, Paris, <https://doi.org/10.1787/acd78851-en>.
- OECD (2019), *Providing Quality Early Childhood Education and Care: Results from the Starting [28]
 Strong Survey 2018*, TALIS, OECD Publishing, Paris, <https://doi.org/10.1787/301005d1-en>.
- OECD (2019), *Working and Learning Together: Rethinking Human Resource Policies for [54]
 Schools*, OECD Reviews of School Resources, OECD Publishing, Paris,
<https://doi.org/10.1787/b7aaf050-en>.
- OECD (2018), *A Broken Social Elevator? How to Promote Social Mobility*, OECD Publishing, [31]
 Paris, <https://doi.org/10.1787/9789264301085-en>.
- OECD (2018), *Education at a Glance 2018: OECD Indicators*, OECD Publishing, Paris, [127]
<https://doi.org/10.1787/eag-2018-en>.
- OECD (2018), *Equity in Education: Breaking Down Barriers to Social Mobility*, PISA, OECD [29]
 Publishing, Paris, <https://doi.org/10.1787/9789264073234-en>.
- OECD (2018), *PISA 2018 Database*, <https://www.oecd.org/pisa/data/2018database/>. [33]
- OECD (2018), "Policies to support lifelong and countrywide learning for a digital future", [32]
unpublished.
- OECD (2018), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for [53]
 Student Success*, OECD Reviews of School Resources, OECD Publishing, Paris,
<https://doi.org/10.1787/9789264306707-en>.
- OECD (2018), *Seven Questions about Apprenticeships: Answers from International Experience*, [43]
 OECD Reviews of Vocational Education and Training, OECD Publishing, Paris,
<https://doi.org/10.1787/9789264306486-en>.
- OECD (2017), *OECD Skills Outlook 2017: Skills and Global Value Chains*, OECD Publishing, [23]
 Paris, <https://doi.org/10.1787/9789264273351-en>.
- OECD (2017), *The Funding of School Education: Connecting Resources and Learning*, OECD [47]
 Reviews of School Resources, OECD Publishing, Paris,
<https://doi.org/10.1787/9789264276147-en>.
- OECD (2017), *The OECD Handbook for Innovative Learning Environments*, Educational [70]
 Research and Innovation, OECD Publishing, Paris, [https://doi.org/10.1787/9789264277274-](https://doi.org/10.1787/9789264277274-en)
[en](#).
- OECD (2015), *Education Policy Outlook: Poland*, OECD Publishing, Paris, [7]

- <https://www.oecd.org/education/profiles.htm>.
- OECD (2015), *OECD Skills Outlook 2015: Youth, Skills and Employability*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264234178-en>. [125]
- OECD (2013), *Synergies for Better Learning: An International Perspective on Evaluation and Assessment*, OECD Reviews of Evaluation and Assessment in Education, OECD Publishing, Paris, <https://doi.org/10.1787/9789264190658-en>. [86]
- OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264130852-en>. [95]
- OECD (2012), *OECD Environmental Outlook to 2050: The Consequences of Inaction*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264122246-en>. [112]
- OECD (2011), *Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264096660-en>. [56]
- OECD (2010), *Improving Health and Social Cohesion through Education*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264086319-en>. [96]
- OECD (2009), *Green at Fifteen?: How 15-Year-Olds Perform in Environmental Science and Geoscience in PISA 2006*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/9789264063600-en>. [114]
- OECD (Forthcoming), *Are students ready for environmental challenges?*, PISA, OECD Publishing, Paris. [115]
- OECD (forthcoming), *Enabling factors for effective and equitable digital education: state of play and promising policies (working title)*, OECD Publishing, Paris. [74]
- OECD (forthcoming), *Levelling the playing field in ECEC: Results from TALIS Starting Strong 2018*. [41]
- OECD (2012, 2015, 2017), *Survey of Adult Skills (PIAAC) Database*, <https://www.oecd.org/skills/piaac/data/>. [34]
- OECD (forthcoming), *The Future of Teachers and Teaching*, OECD Publishing, Paris. [103]
- OECD and Education International (2021), *Ten Principles for an Effective and Equitable Educational Recovery*, <https://www.oecd.org/education/ten-principles-effective-equitable-covid-recovery.htm>. [87]
- Orr, D., M. Rimini and D. Van Damme (2015), *Open Educational Resources: A Catalyst for Innovation*, Educational Research and Innovation, OECD Publishing, Paris, <https://doi.org/10.1787/9789264247543-en>. [66]
- Paccagnella, M. (2015), "Skills and Wage Inequality: Evidence from PIAAC", *OECD Education Working Papers*, No. 114, OECD Publishing, Paris, <https://doi.org/10.1787/5js4xfql4ks0-en>. [24]
- Paniagua, A. and D. Istance (2018), *Teachers as Designers of Learning Environments: The Importance of Innovative Pedagogies*, Educational Research and Innovation, OECD Publishing, Paris, <https://doi.org/10.1787/9789264085374-en>. [59]
- Papay, J. et al. (2020), "Learning Job Skills from Colleagues at Work: Evidence from a Field [52]

- Experiment Using Teacher Performance Data”, *American Economic Journal: Economic Policy*, Vol. 12/1, pp. 359-88, <https://doi.org/10.1257/POL.20170709>.
- Price, L. and A. Kirkwood (2011), *Enhancing Professional Learning and Teaching Through Technology: A Synthesis of Evidence-based Practice Among Teachers in Higher Education*, Higher Education Academy, York, https://www.lth.se/fileadmin/lth/genombrottet/DTR/PLATP_Main_Report_2011.pdf (accessed on 11 July 2022). [82]
- Riding, S. et al. (2021), “Looking beyond COVID-19: Strengthening family support services across the OECD”, *OECD Social, Employment and Migration Working Papers*, No. 260, OECD Publishing, Paris, <https://doi.org/10.1787/86738ab2-en>. [102]
- Smolenski, N. (2021), “Blockchain for Education: A New Credentialing Ecosystem”, in *OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots*, OECD Publishing, Paris, <https://doi.org/10.1787/6893d95a-en>. [76]
- Suarez, V. and J. McGrath (2022), “Teacher professional identity: How to develop and support it in times of change”, *OECD Education Working Papers*, No. 267, OECD Publishing, Paris, <https://doi.org/10.1787/b19f5af7-en>. [104]
- US Office of Educational Technology (2021), “Parent and Family Digital Learning Guide”, <https://tech.ed.gov/publications/digital-learning-guide/parent-family/> (accessed on 31 May 2022). [105]
- Vincent-Lancrin, S. et al. (2019), *Fostering Students’ Creativity and Critical Thinking: What it Means in School*, Educational Research and Innovation, OECD Publishing, Paris, <https://doi.org/10.1787/62212c37-en>. [85]
- Vincent-Lancrin, S. et al. (2019), *Measuring Innovation in Education 2019: What Has Changed in the Classroom?*, Educational Research and Innovation, OECD Publishing, Paris, <https://doi.org/10.1787/9789264311671-en>. [84]
- Whitmer, J. et al. (2016), *Patterns in Blackboard Learn tool use: Five course design archetypes*, Blackboard, https://www.blackboard.com/sites/default/files/resource/pdf/Bb_Patterns_LMS_Course_Design_r5_tcm136-42998.pdf (accessed on 5 May 2022). [80]

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