EDUCATION FAST FORWARD
Building a future that works for all

OECD

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About this publication

The core of this publication, the text and figures concerning trends, is taken from the OECD publication _Trends Shaping Education 2022_ and from its companion series, the _Trends Shaping Education Spotlights_. Additional data is included from OECD's PISA, TALIS and 21st Century Children projects and from the work of the OECD Centre for Skills.

This publication was prepared for the occasion of the Education World Forum 2022, which focused on the theme "Education: Building forward together; stronger, bolder, better." Within the OECD Directorate for Education and Skills, this publication was prepared by Marc Fuster with guidance and support from Andreas Schleicher, Tia Loukkola, Cassandra Davis and Clara Young.

Foreword

Stronger, bolder, better

2020 humbled us with a global shock: the COVID-19 pandemic. We have been reminded that, despite best-laid plans, the future likes to surprise us.

The crisis has exposed the glaring inequities in our school systems – from the broadband and computers needed for online education to training teachers to keep classes going digitally.

Most education systems were nimble: we rethought the curriculum, embraced hybrid learning, adjusted school calendars and schedules, and adapted examinations and assessments methods. We opened up new channels connecting students, families, schools and local authorities. We boosted spending. And, we took remedial measures to prevent learning losses, especially for disadvantaged students.

Now, as we emerge from the crisis, what lessons have we learned? How do we use the ingenuity we showed in the depths of the pandemic as a springboard to stronger, bolder, better education?

The pandemic is just one of a kaleidoscope of disruptions we are looking at. Climate-related crises, extreme digitalisation of societies, new forms of political turbulence both at home and abroad and military conflicts make for a future that is very different from our expectations.

Change may be happening further and faster than we would imagine and, when change grows exponentially, so too must the ability of our education systems to respond to it.

We must be imaginative. We must ask ourselves questions, the right ones. What are the fundamental purposes of education today? What are the kinds of skills that will matter most? What kinds of learning environments will 21st-century students flourish in?

Resilience to external risks and innovation in education *can* go hand in hand. If we anticipate the future, we can shape it too.

Yes, the pandemic surprised us. But it taught us that, if need be, we can rewire our systems on a fly. And if we can do that, we have it in us to craft a stronger, bolder, better education. For all of us.

Andreas Schleicher

Director,
Education and Skills OECD

Climate change

Think green

Climate change is real. Greenhouse gas emissions keep growing in the atmosphere, average global temperature is rising, and climate-related disasters are becoming increasingly frequent. The international scientific community tells us that, if current practices continue, the world will face many negative consequences, including water and food shortages, loss of biodiversity, and forced migration. Climate change adaptation and mitigation efforts are fundamental for building and sustaining resilient socio-economic and ecological systems.

On a daily basis, a deluge of academic studies, reports and news tell us that the Earth's ecosystem is in danger. Forecasts call for rising sea levels, continuing loss of biodiversity and more extreme weather events as a result of climate change.

Temperature changes and other disruptions of the Earth's climate are mainly caused by greenhouse gas (GHG) emissions from human activities. CO_2 from the combustion of fossil fuels, biomass and industrial processes represent more than 70% of such emissions.

Despite the ratification of international agreements to tackle GHG emissions by many countries, CO_2 emissions continue to grow worldwide. In 2019, global energy-related CO_2 emissions reached an all-time high of over 33 gigatonnes, over 11 times the amount of emissions in 1900. In 2020, CO_2 emissions reached the highest-ever average annual concentration in the atmosphere – around 50% higher than when the Industrial Revolution began.

Figure 1. CO_2 emissions keep rising

Global energy-related CO_2 emissions, gigatonnes, 1900-2021

Source: OECD (2022), *Trends Shaping Education 2022*, https://doi.org/10.1787/6ae8771a-en.
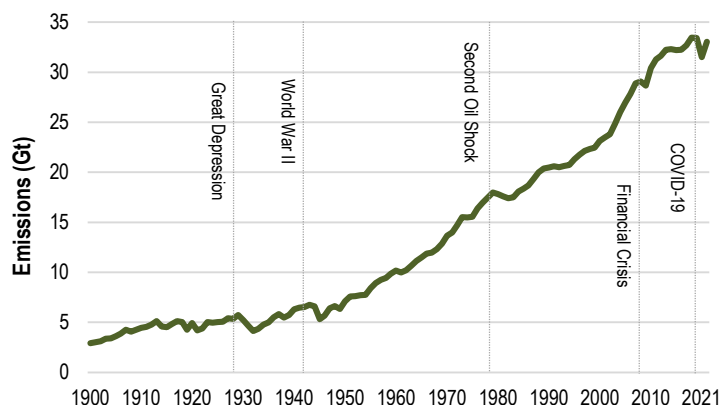
Equipping young people with a solid scientific understanding of environmental issues is key to reducing misconceptions and misinformation. Such foundational knowledge allows them to realistically assess the magnitude of the challenge ahead, understand its causes and recognise the urgency of action.

The good news is that, in 2018, about 8 in 10 students on average across the OECD reported that they know about climate change and global warming, and that looking after the global environment is important to them. However, citizens need to understand the science of climate change as a first step towards taking individual and collective action which is effective in the long-term.

When 15-year-old students were asked about the kind of actions they take to improve the environment, they most commonly reported activities that do not require time or financial commitments, such as reducing energy consumption at home. Few reported more profound forms of engagement, like advocacy and critical consumerism.

Figure 2. Students taking action for the planet

Percentage of 15-year-olds that take the following actions, 2018
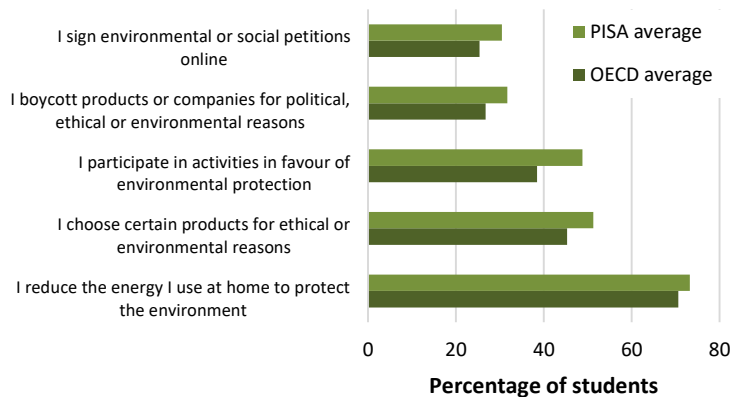
Source: OECD (2020), *PISA 2018 Results (Volume VI): Are Students Ready to Thrive in an Interconnected World?*, https://doi.org/10.1787/d5f68679-en.

And education?

Some questions:

How are extreme weather events due to climate change affecting your education system? How might they affect it in 5 or 10 years from now?

How may organisational arrangements (e.g. calendar, schedules) and resources (e.g. infrastructure) in education need to adapt to climate change?

How can education systems "green up" their infrastructure and operations? What changes to procurement policies are needed to support climate change mitigation efforts?

How can education institutions empower students for climate action? What curricular changes, pedagogical approaches and partnerships (local, regional, national, international) could help?

Skill shortages could hinder the transition towards a "greener" economy. How does your education system support workers and industries to adapt to changing standards and requirements? What else could be done?

Equity & inclusion

Mind the gap

Affluence has increased around the world, and in OECD countries in particular. Global economic integration and technological progress have contributed to a steep reduction of extreme poverty and the improvement of material welfare for many. However, not everyone has benefitted equally. Inequalities have been widening, and rising affluence globally obscures existing divides, within and across countries.

The expansion of international trade and technological progress have helped raise living standards worldwide. These forces have driven a rapid expansion of the global middle class and helped reduce extreme poverty through job creation, the rise of wage levels and lower commodity prices.

While the absolute number of people living in extreme poverty in 1820 (757 million) is similar to that of 2018 (764 million), the share of people living in extreme poverty fell from 76% to 10% over the past two centuries.

All the same, increasing affluence masks inequalities across and within countries. In 2019, the gross domestic product (GDP) per capita for OECD countries was over three times that of the world average. Within countries, inequalities have also been rising as income and, particularly, wealth (savings, investments, real estate, etc.) have become increasingly concentrated in the hands of fewer individuals.

Figure 3. Expanding population, shrinking extreme poverty

People living in extreme poverty worldwide, 1820-2018

Source: OECD (2022), *Trends Shaping Education 2022*, https://doi.org/10.1787/6ae8771a-en.
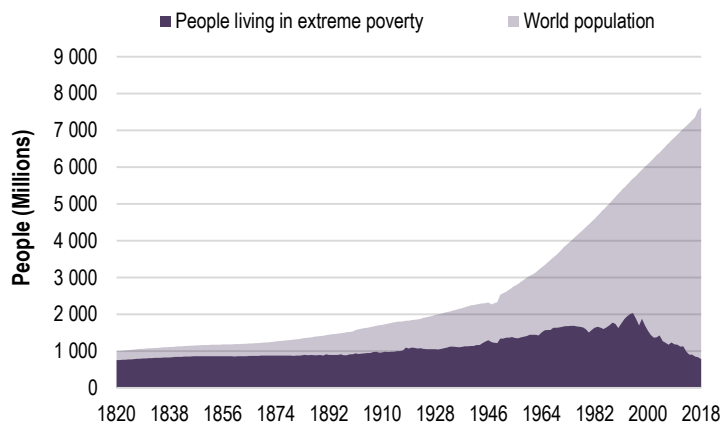

A key driver of inequality is the intergenerational transmission of advantage – of income and wealth, but also of learning opportunities, support and aspirations. Students with advantaged parents in terms of education, occupation and material resources tend to benefit from greater support and encouragement throughout their studies, resulting in higher learning outcomes and educational attainment.

For example, on average across the OECD, nearly 77% of students with at least one parent who completed tertiary education expect to complete university, compared to only 57% of their peers whose parents have lower education levels.

While students from well-off families will often find a path to success in life, academic and socio-emotional support is essential for learners from disadvantaged backgrounds. If such support is missing, subsequent education opportunities will tend to reinforce, rather than mitigate initial inequalities.

Figure 4. Educational attainment and student background

Percentage of 15-year-old students who expect to complete tertiary education or secondary education, by social and economic status (SES) group, OECD average, 2018
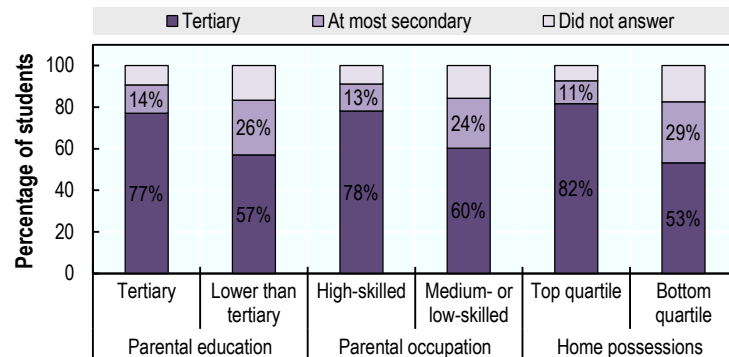
Note: OECD calculations based on PISA 2018 data. Quartiles of home possessions are computed relative to national distributions. See the source for further details.
Source: OECD (2021), *OECD Skills Outlook 2021: Learning for Life*, https://doi.org/10.1787/0ae365b4-en.

And education?

Some questions:

Student identities and background influence academic achievement and aspirations. How can education encourage positive and ambitious learning identities while still accepting students as they are and helping them feel comfortable with themselves?

What elements of the education system itself may need to be adapted? Curricular content? Assessment practices? The diverse forms with which learners are grouped (e.g. via school enrolment, grades, tracks)?

Strategic investments in education can foster greater inclusion. In your system, how could educational resources be distributed to best serve those most in need?

The teacher workforce is often less diverse than the composition of students. How can education systems recruit and retain teachers from diverse backgrounds?

Is equitable access to non-compulsory education, including non-formal education, sufficiently considered in your system?

Investment in intangible assets has grown gradually over the past 40 years. This investment centres on assets like data, software, skills, new organisational processes and intellectual property, like attributed designs and patents.

Intangible assets are to the knowledge economy what machines were to the manufacturing economy. An example of their importance is the rapid growth of a few tech companies compared to the declining revenue of firms that dominated the Fortune 500 decades ago.

Unlike tangible assets, intangibles can be used repeatedly and in multiple places at the same time. Such scalability helps explain how intangible-rich firms like Apple, Amazon, Facebook and Google grew so rapidly in just 15 years. But it also raises questions about how to avoid inefficient market concentration and reduce barriers to new market entrants.

Global markets

Cutting edge

Over recent decades, the source of our economic growth has steadily changed in nature. Investment started to shift from traditional tangible assets like machinery and buildings to intangible assets. Intangibles have no physical form; they are knowledge-based resources like intellectual property and data. In the years to come, innovative firms within open and competitive markets will be key actors in job creation.

Figure 5. The rise of intangibles

Annual revenue of top four companies from the Fortune 500 in 1960 vs "Big Four" tech companies, 2005-2020

Source: OECD (2022), *Trends Shaping Education 2022*, https://doi.org/10.1787/6ae8771a-en.
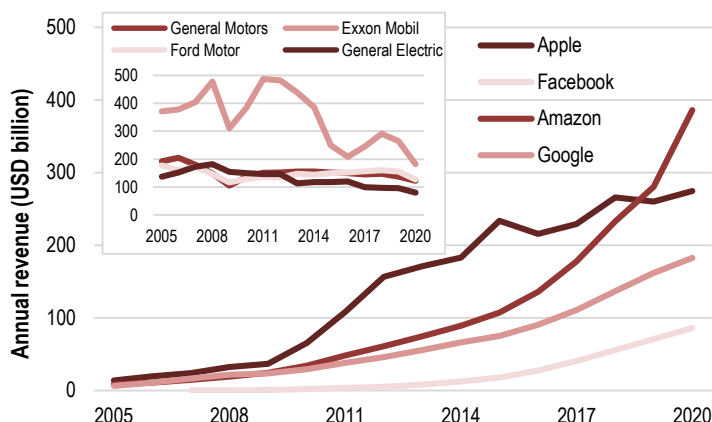
Intangibles such as effective organisational practices are also key to generating value in education. Teachers are knowledge-based professionals who must constantly develop new solutions and adapt those of colleagues by means of collaborative inquiry, observation and reflection.

Yet, on average across the OECD, most teachers work individually in classrooms with few opportunities to collaborate with colleagues. Only 61% of teachers regularly discuss the development of students with colleagues, and less than half exchange teaching materials frequently.

Active collaboration on pedagogy, for example, through peer observation or joint teaching, is even rarer. Aligning incentives and resources to see professional collaboration become a defining characteristic of education institutions' day-to-day is key for innovation to flourish.

Figure 6. Teachers' collaboration with colleagues

Percentage of lower secondary teachers who report engaging in the following collaborative activities in their school with the following frequency, OECD average-31, 2018
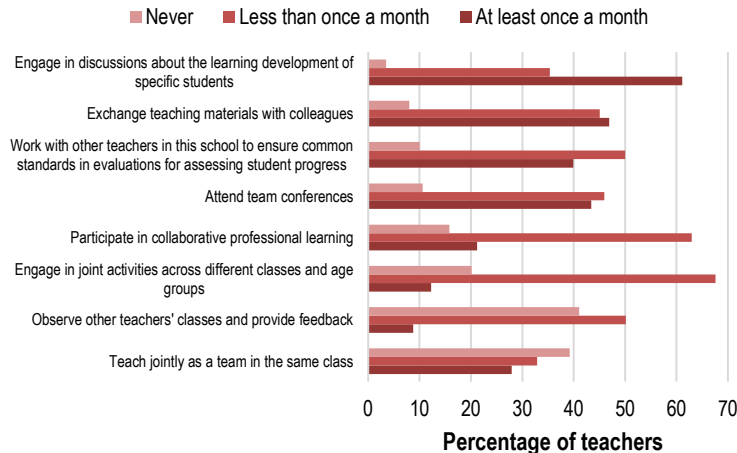
Source: OECD, TALIS 2018, Table II.4.1, https://www.oecd.org/education/talis/.

And education?

Some questions:

The labour market is rapidly shifting its demand from routine skills to complex, higher-order cognitive and attitudinal competencies. How is your education system preparing learners for generating new ideas and products? For new ways of working and producing?

Preparing people for emerging jobs often involves training them to use state-of-the-art technology. Are education institutions equipped to meet this goal? If not, what is needed? New partnerships for apprenticeships or programmes? Greater investment in simulators and virtual reality?

Are initiatives that raise the profile of "what works" supported in your country? How can education authorities help teaching professionals to connect to one another to exchange ideas on what might?

Big tech firms are becoming key players in education, especially through the provision of digital education platforms and services. What are the implications for education governance? What does accountability look like in a global digital world?

In 2005, only about 1 in 2 individuals across the OECD used the Internet regularly, and only 1 in 3 did so daily or almost every day. This is in stark contrast with the picture in 2020, when about 80% of individuals used the Internet daily or almost every day on average across OECD countries.

Of course, back in the early 2000s, smartphones, with their high-speed connectivity, intuitive interfaces and access to infinite apps, did not exist.

Today, many aspects of our lives depend on digital technologies connecting people and information to offer rapid solutions at the tap of a finger.

A close look at people's digital activity shows that, for example, only 40% of Internet users used the Internet for obtaining information about goods and services in 2005. By 2020, these figures had almost doubled, up to 75% of Internet users on average.

Digitalisation

Our world in data

Digital technologies have become an integral part of our lives. Many common activities that once required physical contact, such as talking to family and friends or consulting a doctor, are now carried out online. The digital space is no virtual "second life", but it is an intrinsic part of one's life. Whether it is a job, a room for the night, or the love of your life, digital activity often translates into offline outcomes.

Figure 7. At the tap of a finger

Internet users using the internet (last three months) for finding information about goods and services, 2005-2020

Source: OECD (2022), *Trends Shaping Education 2022*, https://doi.org/10.1787/6ae8771a-en.
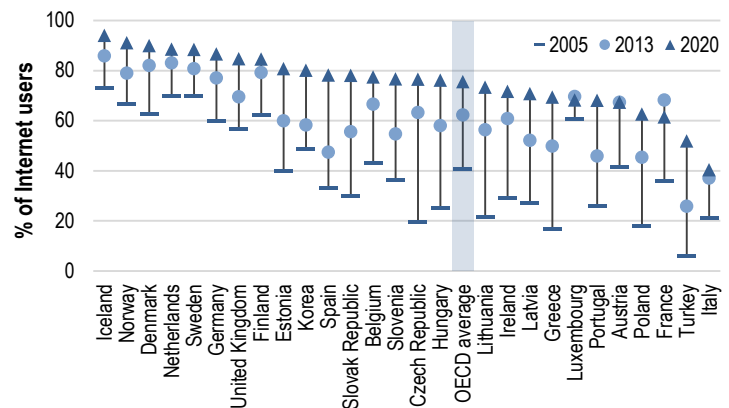
Digital technologies offer numerous advantages, including wider access to education and training opportunities, and across the OECD, most children are connected and many start using them even before they can walk or talk.

Yet, access alone is not enough. As remote learning during the pandemic exposed, the self-directed nature of many online learning opportunities becomes a barrier for those lacking the skills and dispositions to engage independently and fruitfully. This is particularly the case when contact with educators and peers, and support from parents is lacking.

Fast-paced technological change renders lifelong learning increasingly relevant. Individuals' ability to adapt to new expectations and future job demands will rest on having acquired strong foundation skills, and developed the willingness to learn and the habit of learning.

Figure 8. Students' self-efficacy, learning goals and motivation

Percentage of students who report to agree/strongly agree or who report the following statements are moderately, very, or extremely true of them, OECD average, 2018
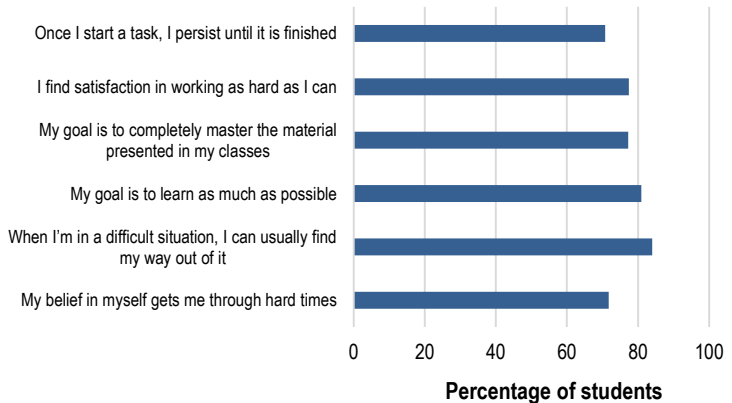
Source: Ikeda and Echazarra (2021), "How socio-economics plays into students learning on their own: Clues to COVID-19 learning losses", https://doi.org/10.1787/2417eaa1-en.

And education?

Some questions:

Are your education system's digital infrastructure and equipment up to speed? Are teachers being trained to integrate digital tools into their practice?

Hybrid teaching and learning that blend virtual and physical activities may be here to stay. How can the organisation of spaces, time, content and technologies be adapted to support personalised learning? To better connect formal, non-formal and informal learning?

At its best, greater flexibility can help educators cater to the particular needs of learners and help them develop strong learning skills. What are the trade-offs related to physicality and distance, autonomy and support?

What opportunities and risks do digitalisation and datification pose for teachers' autonomy and leadership in student learning? How can teacher and student voice and choice be incorporated in decisions regarding educational technology development and purchases?
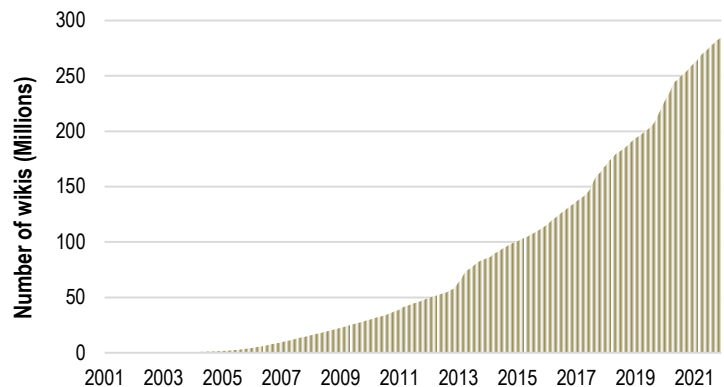
The unprecedented connectivity afforded by digital technologies is redefining – democratising, one could say – the ways in which knowledge is produced and circulated, which in turn challenges traditional assumptions of civic participation and public deliberation.

A wide array of information and knowledge are nowadays available in the Internet. In addition, whereas only an elite few produced the encyclopaedias and mass media of the 20th century, today's social media and Internet sites like Wikipedia rely on the masses to generate and curate content. For example, the number of pages in all wikis grew impressively from about 10 000 to over 250 million in 20 years.

Access to information and knowledge at lower or even no cost is doubtless a positive trend, and so is the multiplication of channels with which we can connect to, discuss with and learn from others. However, with these possibilities, the risks of misinformation and bias have also increased: it can be difficult to understand the quality and veracity of what is presented.

Knowledge democracies

Is this for real?

Historically, we have struggled with a lack of information and knowledge. Today, we struggle to handle its abundance. It has never been easier to express one's opinions and reach out to others as it is in the digital age. All the same, despite expanding connectivity and opportunities to make our voice heard, there is no guarantee that the information we access is reliable nor that we will reach to others and actually listen to what they have to say.

Figure 9. The wisdom of crowds

Number of pages in all Wikis, 2001-2021

Source: OECD (2022), *Trends Shaping Education 2022*, https://doi.org/10.1787/6ae8771a-en.

In the 21st century, literacy is not only about reading and writing. It also relates to making sense of abundant, often conflicting pieces of information, assessing the reliability of sources and the validity of given claims within specific contexts.

These competences are not a given. In 2018, when PISA asked 15-year-old students to distinguish facts from opinions in a text, only 47% of them demonstrated such capacity on average across OECD countries. But the good news is that PISA also showed that education can help learners develop these skills.

In 2018, an average of 54% of students across the OECD said they were taught how to recognise whether information is subjective or biased at school. Importantly, education systems in which more students were taught how to do this had a higher percentage of students who could correctly distinguish facts from opinions in PISA, even after accounting for their reading performance.

Figure 10. Learning digital literacy skills at school

Percentage of 15-year-olds who report that they were taught how to detect whether information is subjective or biased in school, 2018
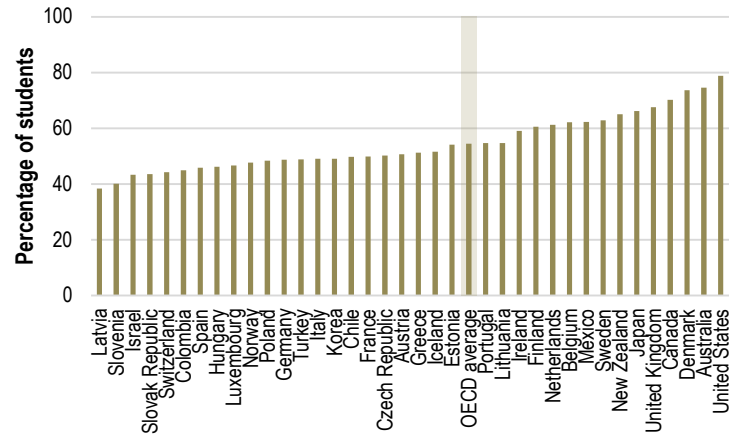
Source: Table B.2.6 in OECD (2021), *21st-Century Readers: Developing Literacy Skills in a Digital World*, https://doi.org/10.1787/a83d84cb-en.

And education?

Some questions:

Is more knowledge always better? What (digital) skills and attitudes are needed to effectively evaluate the quality and trustworthiness of information? How can we support teachers to validate the knowledge they use in their teaching?

Does more knowledge lead to more action – and if so, what kind? How should education systems confront questions about combining knowledge with values?

Digital skills involve the capacity to operate and use digital devices effectively and safely. They also involve the capacity to socialise and behave ethically in digital environments and to develop digital content. Does your education system support students in all these fronts?

Our social circles influence our access to knowledge – directly, as sources, and indirectly, by shaping our motivation to know, for example. Should educational institutions work more actively to strengthen (digital) social ties across different groups in society? If so, how?
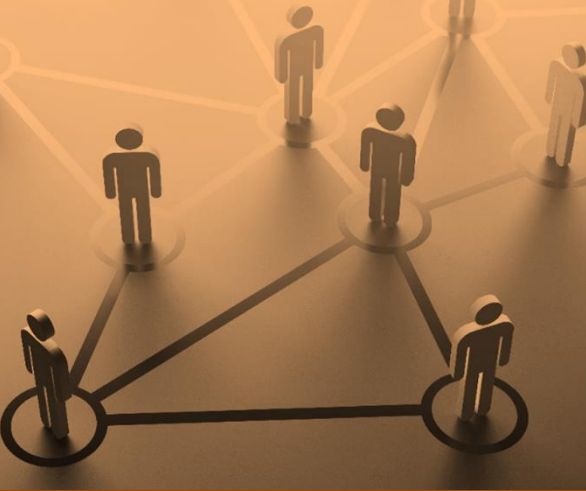
Complexity

Connecting the dots

In our global and interconnected world, political institutions face the challenge of responding to and communicating about emerging, entangled and dynamic phenomena, such as a global pandemic. This is a delicate task – particularly when robust knowledge is missing – and public trust in policymaking suffers. Working in partnerships to align people and resources and mobilise collective intelligence is key to tackling our greatest challenges.

The speed and scale with which COVID-19 spread to become a global pandemic is a reminder that our world is becoming increasingly interconnected. Global risks such as pandemics, military conflicts, financial crises, and climate change require coordinated international responses.

Since the end of World War II, the world has seen the number of multilateral development organisations grow from 9 to over 182, reflecting a trend of increased international collaboration. This expansion has seen multiple phases, from the original post-war reconstruction banks to the creation of regional development banks in the 1960s and 70s and sector-specific 'vertical funds' in the 1990s, such as the Global Environmental Facility and the Vaccine Alliance.

Despite the deep social, economic and public health effects of the pandemic, the development of safe and effective vaccines in record time proves that global collaboration between governments, scientists and society at large can enhance resilience to risks and reduce uncertainty.

Figure 11. Working together across borders

Number of multilateral development organisations, 1944-2020

Source: OECD (2022), *Trends Shaping Education 2022*, https://doi.org/10.1787/6ae8771a-en.
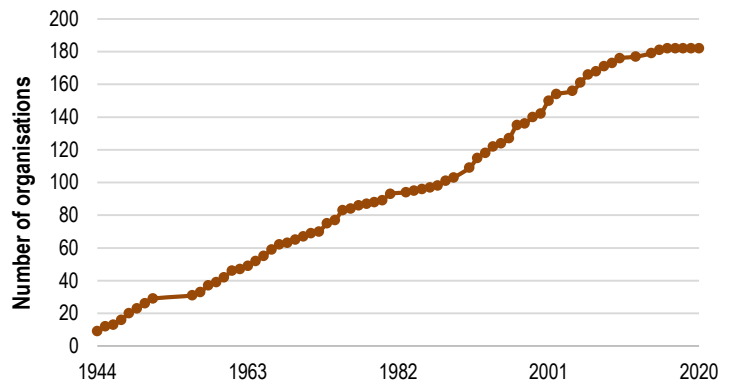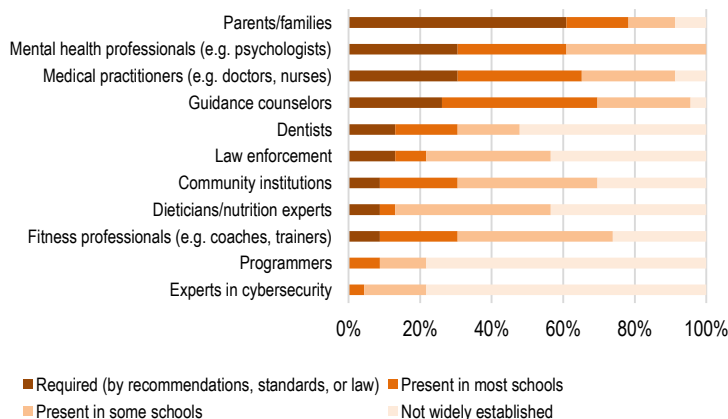
Given that challenges related to learning and student well-being go beyond the walls of education institutions, parents and wider community are instrumental partners in creating the best conditions for learner's healthy development.

Across OECD countries, partnerships between schools and a range of local actors are growing increasingly common to enhance education provision. Partners include parents as well as other social service providers, such as medical professionals, community institutions such as libraries and museums or, more unusually, cybersecurity experts.

Education-community partnerships can take multiple forms and target different goals. They can provide and enrich curricular and extracurricular activities, ensure that curricula align with local labour market needs, or enhance academic learning while serving the community through service-learning.

Figure 12. It takes a village: Schools as hubs of local expertise

Percentage of OECD countries where schools partner with diverse stakeholders, 2019

Legend:
- Required (by recommendations, standards, or law)
- Present in most schools
- Present in some schools
- Not widely established

Note: This figure represents the percentage of country responses out of 24 OECD countries responding to this question in the survey.
Source: Burns and Gottschalk (2019), *Educating 21st Century Children: Emotional Well-being in the Digital Age*, https://doi.org/10.1787/b7f33425-en.

And education?

Some questions:

In our global world, connecting to others through open and appropriate multi-cultural interactions is increasingly relevant. How can education foster understanding, tolerance and appreciation of different perspectives and world views in society?

In your community, what kind of school-level interventions, partnerships and services (e.g. resourcing, communication with families and communities, counselling services, digital technologies) could help education institutions better support the learning and well-being of students and teachers?

In increasingly complex education systems, involving a greater number of, and more vocal stakeholders, what is the potential of policy co-creation mechanisms to enhance education policy design and implementation? By including underrepresented voices and fostering a sense of shared responsibility, could such mechanisms increase evidence quality, inclusivity and public trust?

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