Building the future of education
For 60 years the OECD has supported countries in improving and transforming their education systems through comparative evidence, analysis and policy advice.

Over the course of its history, the OECD has assumed a leadership role in the field of international collaboration in education through the wealth and quality of its comparative data, its assessment programmes and surveys, and its analytical and policy work. The OECD operates with and alongside many other agencies and organisations in this space. Each organisation focuses on its comparative strengths and advantages. For the OECD, these include its multilateral frameworks for comparative data collection and analysis, for peer learning and peer review, and for convening dialogue among policy actors and a wide range of stakeholders. But perhaps the most significant comparative strength of the OECD lies in its capacity to develop innovative and forward-looking ideas and approaches that inform the international debate, inspire policy processes and shape the future of education.

In order to remain relevant, the OECD’s work on education needs to engage with emerging issues, operate at the frontiers of knowledge, and engage with a range of possible futures and plausible opportunities that are shaping the future of learning. At the same time, it is important that the OECD remain a credible actor, to strike a delicate balance between making an impact and producing quality information to add to the conversation.

It is time to take a bold look at the future of the knowledge, skills, attitudes and values that will matter most, and the kind of learning environments and educational opportunities that can enable these best throughout the lifecycle. The challenge is to imagine futures where resilience to external risks and innovation in education go hand in hand.

This is a good moment to engage with this. The disruption generated by the pandemic has given urgency and visibility to the work of education due to the impact of school closures and the shift to online learning. It has further highlighted the growing importance of lifelong and lifewide learning by accelerating labour market disruption, and provides an opportunity to rewrite narratives.

For higher education, the pandemic has not just been challenging for students, but also for educational institutions. Different from the school sector, where attendance is compulsory and provision is largely government funded, university education is a choice for students and competes with a range of alternative learning and occupational opportunities. Moreover, while public funding for schools is more likely to be safeguarded, public funding for universities could be at greater risk. In addition, declines in public funding to subsidise attendance will be more difficult to offset with increased fees, owing to sharp reductions in household incomes.

But more generally, the crisis has exposed the value proposition of universities. Students are unlikely to commit large amounts of time and money to consume online content. Students go to universities to meet great people, to have inspiring conversations with faculty, to collaborate with researchers in the laboratory, and to experience the social life on campus. To remain relevant, universities will need to reinvent learning environments such that digitalisation expands and complements but not replaces student-teacher and student-student relationships.
The challenges are bound to rise as digitalisation drives forward the unbundling of educational content, delivery and accreditation that holds together today’s universities. When it comes to content, universities will face an uphill struggle competing with large and highly professional providers, and as the scale and nature of hybrid learning evolves, the locus of control or ownership of course development, design, and assessment may shift as university instructors rely more heavily upon tools provided by publishers and open educational resources providers alike. Accreditation still gives universities significant power, but digitalisation may challenge this too, e.g. through micro-credentialling and blockchain technologies, which will give far greater discretion to learners to decide what to learn, when to learn, how to learn and where to learn, and to have their learning gains independently recognised.

This paper identifies opportunities where the OECD could contribute to this in the years to come.

The paper was developed in line with the OECD’s broader strategic orientations and priorities in responding to current policy challenges and pursuing multilateral approaches to inclusive and sustainable recovery after the pandemic. To achieve the OECD’s strategic objectives, education and skills will be key. Without building the knowledge, capabilities, attitudes and values of future generations, it is impossible to imagine sustaining long-term inclusive growth, maintaining technological progress, tackling the consequences of climate change or building equitable and cohesive societies.

This paper is the result of an iterative, participatory process within the Directorate for Education and Skills, combining top-down and bottom-up stages. The aim of this process was to stimulate strategic thinking on possible future avenues of work within the Secretariat. The paper was also peer-reviewed by other OECD Directorates and serves to inspire the development of proposals for future work by Members.
Education has seen massive expansion over the years with unprecedented growth in participation and attainment levels. Over the past 200 years, education systems have developed into major engines of economic growth and prosperity, state and community building, and social progress. By developing the knowledge, skills, attitudes and values on which societies rely, forging social cohesion and preparing people to become and remain competent workers and active citizens, education has shaped the world we live in today. In particular, the expansion of education and the increased supply of skilled workers and citizens have fostered democracy, the emergence of inclusive social and economic institutions, and the transformation to innovation-oriented knowledge societies. Like OECD countries, emerging and developing countries have often followed similar routes in expanding educational opportunity – sometimes at a more rapid pace. In some, the quality and equity of education are now greater than in OECD countries.

At the same time, the world has seen a growing disconnect between the infinite growth imperative and the finite resources of our planet; between the financial economy and the real economy; between the wealthy and the poor; between the concept of our gross domestic product and the well-being of people; between technology and social needs; and between governance and the perceived voicelessness of people. No one should hold education responsible for all this but neither should one underestimate the role that the knowledge, skills, attitudes and values of people play in social and economic development, and in shaping cultural contexts. Our economies are shifting
Towards regional hubs of production, linked together by global chains of information and goods, but always 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 opportunity.

Because of the long time horizon involved in transmitting the heritage of humankind to new generations and preparing young people for their entire lives, education tends to be a conservative social system. But it is the most important social system for anticipating and preparing the future. What young children learn in early childhood education today will affect their aspirations and contributions to society, their health, their behaviour and the cost of social security when they reach old age. This tension between the past and the future is typical for education.

Learning for an uncertain future

The future is unpredictable. The acronym VUCA – volatility, uncertainty, complexity, ambiguity – suggests that we live in a time and a world where the future is intrinsically unknown. To educators and education policy makers, this is a troubling message. How can they educate learners for jobs that have not yet been created, to use technologies that have not yet been invented, or to solve social problems we cannot yet imagine? Today, we are living in a time of dramatic change and unexpected turns. The immediate future looks grim and promising at the same time. But we are not the victims of change or its powerless spectators; we constantly shape the future ourselves. The future is always in the making, and it is our work.

Education is at a crossroads and the pandemic has further aggravated the sense of disorientation. Some see no clear future for educational institutions as they have existed for centuries. Others claim that previous innovation in education has failed, and advocate re-emphasising discipline, memorisation and other recipes that were successful in the past. Moreover, many believe that education has failed in keeping its promises of fairness, equity and social mobility. Education is about investing and believing in the future; despair and pessimism are its worst enemies. Young people are less likely to invest their time and energy in better education if it seems irrelevant to the demands of the "real" world. Businesses are less likely to invest in their employees’ lifelong learning if those workers move away for a better job. And policy makers are more likely to prioritise the urgent over the important – even if the latter includes education, an investment in the future well-being of society.

As with other mega-challenges that face humanity today such as climate change, the impact of artificial intelligence (AI) and new technologies, mass migration or global taxation, human ingenuity is key. Through research, through building on both data and experience, and by nurturing collective intelligence, imagination and vision, we can create a better future.

Disruptive technological change

Technological change has challenged education throughout history, giving rise to new opportunities and changing demands. To keep pace and anticipate the impact of technological change requires vision, boldness and courage from leaders and policy makers, as well as capacity on the ground. Artificial intelligence, cloud computing, big data, the Internet of Things, virtual reality and other forms of digitalisation are fundamentally reshaping the world, changing what we learn as well as the means through which we learn. The pandemic is accelerating the digital transformation. Today, we face the reality of "hyper-digital" futures in just 10 to 15 years – futures with universal connectivity, ubiquitous computing, disruptive digital business models, mostly automated physical production, increasingly virtual work and digitised global trade. All this will transform businesses and markets, the nature of work and the demand for skills, as well as the ways in which we participate in physical or virtual communities and engage in personal relationships. Digitalisation affects security and privacy as well as health and well-being, particularly among children. It impacts social relationships, social cohesion and the functioning of democracy. Yet while digital technologies and globalisation can have disruptive implications for our economic and social structure, such implications are not predetermined. It is the nature of our collective response to these disruptions that will determine their outcomes – the continuous interplay between the technological frontier and the cultural, social, institutional and economic contexts and agents that we mobilise, including education communities.

Digital technologies bring important changes and opportunities to what people need to learn as well as how they learn in a technology-rich world. They enable us to reach new populations such as older people; youth who are not in employment, education or training (NEETs); and people with special needs. Technology enables educators and learners to access knowledge in multiple formats, and in ways that bridge time and space. It also supports new ways of teaching that focus on learners as active participants. When schools had to close and in-person education replaced by other forms of educational delivery, teachers, schools and entire systems turned to distance education whether through low-tech media
or advanced digital technologies. The most advanced and pro-active systems discovered technologies that enhance experiential learning by supporting project- and enquiry-based teaching methods, facilitating hands-on activities and co-operative learning, and delivering formative real-time assessments. There were also interesting examples of technology supporting learning with interactive, non-linear courseware based on state-of-the-art instructional design, sophisticated software for experimentation and simulation, social media and educational games. These are the learning tools that are necessary to develop 21st-century knowledge and skills. Today, one teacher can educate and inspire millions of learners, and communicate their ideas to the entire world. The pandemic has accelerated the digital transformation of education. The change is coming abruptly and many lessons are still to be learned, but the change itself is irreversible.

Perhaps the most distinguishing feature of digital technologies is that they not only serve individual learners and educators but can also build an ecosystem of learning predicated on collaboration. Technology can build communities of learners that make learning more collaborative, thereby enhancing goal orientation, motivation, persistence and the development of effective learning strategies. Similarly, technology can build communities in which educators share and enrich educational resources and practices, and collaborate on professional growth and the institutionalisation of professional practice. It can also help system leaders and governments develop and share best practice around curriculum design, policy and pedagogy. However, there may be tensions between digital ecosystems of learning, the social functions of education and physical learning environments.

Whether they come in the form of gradually evolving trends or abrupt systemic shocks, changes reshape the world, the preoccupations and belief systems of the children, young people, families and communities that education serves; they redefine our expectations of education and affect the ways in which learning is organised. Education is no longer just about teaching students something but helping them develop a reliable compass and the tools to confidently navigate through an increasingly complex, volatile and uncertain world. Success in education today is about identity, it is about agency and it is about purpose. It is about building curiosity – opening minds; it is about compassion – opening hearts, and it is about courage – mobilising our cognitive, social and emotional resources to take action. These may turn out to be the best weapons against the greatest threats of our time: ignorance – the closed mind; hate – the closed heart, and fear – the enemy of agency.

Education for a new social contract

Changes in social stratification and the social fabric have a deep impact on how different social groups integrate education into their strategic behaviour. For many years, education was the most important route to improving one’s life and those of one’s children through upward social mobility. However, in several OECD countries, upward social mobility has become more difficult to achieve, and the fear of downward social mobility is becoming more widespread in the middle classes. Large parts of the population seem to believe that the social contract of the 20th-century welfare state of which public education is an important component has either ended or no longer serves their interests. The meritocratic ideal that one can secure a better life than that of their parents through education, talent and effort was crucial to the expansion of education systems in the second half of the 20th century. But when the engine of social mobility starts to sputter, trust in school systems falters and young people from vulnerable backgrounds may no longer invest their time and energy into schooling. The consequences of this will be felt beyond education when people lose trust in the “social contract”, become defiant towards the “system”, embrace populism and turn away from democracy.

While education has been the most powerful vehicle for the progress of social groups and entire nations, and their escape from poverty and social exclusion, it can also be a vehicle for inequality itself. Educational opportunities are not fairly distributed within societies. Education contributes to the transmission of advantages and privileges from one generation to the other. The selection function of modern education systems often confounds talent with social background.

Yet, education is still the main institutional framework that keeps societies together. It is through education that societies can build social cohesion by integrating new generations and newcomers into the social fabric. By instilling a common canon of knowledge, shared behaviours and collective social values, education develops shared identities and a sense of belonging. It can also ensure a good start for every young person by securing a level of foundational skills and competences that help with entry into the labour market. Educational institutions face increasing pressure to fulfil these functions and promises, and failing to do so would result in a huge social cost. For societies, the long-term cost of low skills is significant and often underestimated, as are the risks of decreasing interpersonal trust and social cohesion.

The pandemic has deepened our understanding of how education keeps inequality and social cohesion in balance. When schools closed or had to turn to distance education and home schooling, one of the immediate effects was the amplification of inequality. Schools are now widely recognised as social institutions that help contain social inequality. When education
systems turn to flexible, diversified and personalised ways of working, the risk of social differentiation and inequalities increases. The post-pandemic educational reality will require systems to look for new solutions to the challenges of inequity and fairness in education. The “one-size-fits-all” approach of schooling will falter as personalised learning rises in importance. In this transition the approaches to equity and diversity will need to change.

Reimagining the purposes of education

Today more than ever, our changing environment is pushing us to question and reimagine the purposes of education. Unlike previous stages of technological change, digitalisation and, especially, artificial intelligence will open up hitherto unknown possibilities. Digital technologies will not merely disrupt our jobs, communities and lives but enhance our capabilities. Smart machines and bio- and neurotech will superempower people with entirely new cognitive and sensory capabilities. At the same time, humans are in danger of losing their economic value as biological and computer engineering render many forms of human activity redundant and decouple intelligence from consciousness. This has profound consequences for the purpose of education. That is why it is important to understand and anticipate technological advances, especially in the field of artificial intelligence, in order to proactively shape the future of education.

Tomorrow’s educational institutions will need to help learners think for themselves and join others in work and citizenship. They need to help learners develop a strong sense of right and wrong, and sensitivity to the claims that others make. Individuals will need to learn to live with themselves, with others, and with the planet. At work, at home and in the community people will need a deep understanding of how others think, whether as scientists or artists, and how others live in different cultures and traditions. Whatever tasks machines may be taking over from humans at work, the demands on our capabilities to contribute meaningfully to social and civic life will always keep evolving. Digital technologies do not oblige us to enter an impossible war with machines but invite us to reconsider what it means to be “human” and how we can imagine a flourishing life.

Although the challenges facing education today may seem daunting, many resources can be mobilised to overcome them. Knowledge about education is turning into the most valuable resource for education itself. Indeed, the growth in science and research is also enhancing the transformative capacity of education systems. New knowledge about education is created at a very rapid pace, renewing the knowledge base on which education thrives but also making old knowledge obsolete. For a long time, education combined limited scientific knowledge with experience developed and transmitted by educators, often complemented by personal ingenuity and imagination. Innovations in education were driven more by presumptions about children’s innate curiosity, for example, than by scientific evidence of cognition and brain development. This is changing today due to progress in various scientific disciplines relevant to education. A new “science of learning” is emerging, composed of building blocks from cognitive psychology, neuroscience, brain research and social psychology. This offers opportunities for education systems to not only drastically improve the efficacy of educational practice but strengthen teacher professionalism and overall social trust in education.
We used to learn to do the work, now learning is the work. Our prosperity and well-being hinge on individual and collective ways of knowing, understanding and changing the conditions in which we live together. This applies to the current pandemic but also to future risks and shocks, whether caused by technology, climate change, demography and social change, or natural disasters. Technology is enhancing human capabilities while man-made obstacles to sustainable well-being challenge human civilisation’s ingenuity. Increasing interdependence is connecting our fates across the globe. Above all, human learning is about enhancing potential and opportunities. In the future, learning will enable individuals, communities, organisations and societies to translate opportunities into an active sense of agency that is necessary to ensure a good life for all. Learning is about enabling individuals and societies to acquire agency and act for the common good.

Educational institutions

Learning as a fundamental human activity is not bound by place and time, but the institutional settings in which it takes place continue to evolve. Human history has created institutions such as schools and universities with the mission of offering rich conditions for effective learning. Over the centuries, these institutions have changed from meeting the learning needs of the few to catering to the many. They have also formalised
and professionalised. They serve as the main conduit for the socialisation of new generations; the effective allocation of individuals to jobs and social positions in an increasingly high-skilled workforce; the promotion of social mobility and social progress; and the development of identity and citizenship. Educational institutions fulfil these functions by professionally supporting cognitive growth and transmission of knowledge, but also by fostering character development and behavioural training, and instilling values and ethical judgment. At the same time, in the public consciousness, traditional education institutions (formal education) are under increasing scrutiny as to their worth and whether they deliver “real” education that is aligned with real world needs. This is not a new opinion but voices justifying that position are more conspicuous (e.g., tech billionaires who dropped out of formal education; public discourse about how misaligned education institutions are with the modern workplace and technology). In sum, it is a battle for hearts and minds: the OECD needs to position itself as an authority in this shifting landscape.

Ecosystems of educational institutions

Institutionalised settings remain important in providing spaces and opportunities for learning but they are gradually losing their monopoly. They need to engage with other channels and modes of learning. School closures and many other ways the pandemic disrupted the operations of schools have led to unprecedented technological and social innovation in education, obliging policy makers and educators to think of new ways to configure the people, the spaces, the time and the technology to enable learning under new conditions. It will be key for the future of education to carefully assess what has been learned from these experiences in diversifying the institutional and technological settings of education.

The pandemic has also shown that no school is an island. Schools and teachers must interact and collaborate with other sites of learning. Families and personal social relations – which are themselves under constant transformation – remain important learning settings with which schools have to negotiate and collaborate. When schools closed, the support provided by parents in home schooling proved to be the single most important factor for the successful continuity of student learning. Social institutions such as health and welfare systems, politics, religion, traditional and new social media, and many other aspects of modern society will play an ever more important role in socialising people and providing spaces for human learning. The distinction between acquiring knowledge and skills (in schools) and applying them (in workplaces) is gradually eroding with components of learning, assessing and qualification being renegotiated between both spheres. Employers will become more important in not only providing training and informal learning at the workplace but in engaging in social dialogue about the purpose, relevance and substance of education. It will be increasingly difficult to keep young people motivated to learn in schools when the outside world offers so much distraction as well as inspiration.

Learning becomes ubiquitous

Technology is also creating new, alternative channels for human learning outside of institutional frameworks. Isolated time and space for learning was necessary when teachers and resources were scarce but the ubiquity of opportunities will allow learning to move beyond its institutional confinement. Enhanced by technology, learning will gradually flow to informal contexts and move beyond age-defined limitations. Countries will shift from qualification-oriented attainment up front to a new distribution of learning and skills development over the lifespan. Technology can support both learning throughout life as well as ways to recognise such learning. Moving learning out of its institutional and age-related barriers will create important public policy challenges, requiring the development of new partnerships to support learning with innovative arrangements on both the supply and demand side.

Formal, institutionalised education in schools and universities as we know them today will still have a future as long as the richness of its learning experiences offers significant benefits to learners. Learning is not primarily a transactional process of knowledge transmission but a social and relational enterprise – we learn from and with people. Moreover, learning happens best in settings where time and space are condensed with the single purpose of fostering learning. By adding extrinsic motivational incentives to the learner’s intrinsic motivation, and by requiring the learner to go where (s) he would not go on his/her own, schools open up the mind to the unknown. At the same time, schools and universities need to collaborate better with the outside world. Building partnerships between schools and local community organisations, between universities and local businesses, and bridging the different worlds where people learn will be key for the future of institutionalised education. From a pragmatic and policy-relevant point of view, this paper will focus primarily on institutional education in schools and universities. But it is important to remember that these institutions will struggle to survive in a world with an abundance of other learning opportunities.
The international dimension

In the early 20th century, an institutional framework emerged to provide opportunities for countries to engage in international dialogue and mutual learning. While maintaining strong connections to national history, language and culture, education systems have always interacted with each other. Students, teachers and scientists have travelled and inspired each other with concepts, theories and practices. Slowly, but decisively, the international, comparative perspective has gained prominence in the development of policies and practices.

Since World War II, the world has established a number of multilateral organisations to bring nations together for a common cause of peace and economic prosperity, founded on the idea that collaboration and mutual understanding can make the world a better place. As inequality grows in some OECD countries and continues to persist in others, globalisation is sometimes perceived as protecting the interests of the elites and the affluent. Growing resistance to globalisation culminated in a series of political events, which have given way to more nationalistic and even protectionist policies. It is possible that the pandemic and its aftermath will further reinforce isolationist tendencies. In today’s climate, the added-value of multilateralism must be more clearly demonstrated. The systemic threats of the 21st century from pandemics to climate change or the regulation of artificial intelligence require intense collaboration between countries. Education is no exception.

Today, the international level is an important component of the governance architecture in education. Its function is to complement jurisdictions with lawful and legitimate power over education with a space for
comparing, collaborating and learning from others’ experiences. The lack of variation in many aspects and structural components of education systems within jurisdictions makes it difficult to assess their effectiveness. The additional variation international comparisons bring adds an important source of insight. Tapping into the best knowledge available, learning about what works in what context, confronting ideas and engaging in peer learning, can help jurisdictions perform better. International organisations also mobilise the comparative evidence, research knowledge and insights from peer review to provide policy advice to countries, incorporating aspects of education policy implementation and evaluation. Comparative metrics used for benchmarking systems are now powerful tools for policy development and implementation. Trustworthy comparative data and indicators are rapidly becoming an important resource for governments to assess and benchmark education systems against those of other countries. The OECD has become the most prominent actor in this regard.

Strategic mission of OECD’s work in education

As formulated in the strategic mission of the OECD’s work in education, the fundamental rationale for intergovernmental collaboration in education is to support jurisdictions in their efforts to achieve high quality lifelong learning for all, which contributes to personal development, sustainable economic growth and social cohesion.

This rationale can be further explicated by the following four purposes:

- Learners have the opportunity and agency to learn in formal, non-formal and informal environments;
- At least in the initial stages of education, learners are supported by capable and professional educators;
- Educational institutions provide learning opportunities in high-quality, equitable, cost-effective and innovation-friendly ways, both in partnership with and as complements of other learning environments and organisations, including workplaces;
- Education systems deliver on economic and social outcomes and are capable of adapting themselves to new challenges.

Opportunity and agency

The goal of education is to empower learners, both individually and collectively. As societies continue to change, education systems need to adapt. They need to provide the most adequate opportunities to people to develop the knowledge, skills, attitudes and values that enable them to realise their potential throughout their lives – from early childhood to old age. Learners need to develop agency and co-agency to thrive in a changing world. They need to develop a sense of responsibility to actively participate in building societies, and the ability to define purpose and take actions to achieve goals, including realising their own learning. Developing agency over one’s life and learning is itself the outcome of systems’ capacities to provide opportunities to learn. Learners will need to take ownership and responsibility to design their own learning trajectories through combinations of institutionalised formal and non-formal education with self-directed, autonomous and informal learning.

This puts the development of broader, transversal skills, as well as attitudes, values and metacognitive skills, at the same level as traditional disciplinary knowledge. However, learners will need guidance and support to exercise agency in shaping their learning biography. They will need to be confident that institutional learning environments will recognise their prior learning through accreditation that enables them to seamlessly reconnect with institutional and informal learning.

The pandemic has significantly strengthened the importance of learner empowerment. The pandemic is a stress test for education’s resilience to provide opportunities to learn even amidst the most difficult circumstances and for students’ resilience to steer their own learning. Even as schools are becoming fully operational again, one of the lessons to be learned from the experiences during the pandemic will be that schools and teachers need to nurture agency, metacognition and self-control as much as cognitive development.

At the same time, education systems are increasingly challenged to improve equality of opportunity, foster social inclusion and integrate students from diverse social, cultural and ethnic backgrounds. Education systems that fail on equity allow talent to be wasted at a time when all countries are transitioning to knowledge-intensive economies and societies. The pandemic has significantly intensified inequities in education. Some of the better-off students had the economic and cultural resources and support to maintain or even improve their learning while more vulnerable and disadvantaged students immensely suffered. When schools close, social support networks falter and vulnerable students become dependent on very low levels of support at home or in their communities. Where there was already a serious issue of equity in education systems before, the pandemic has made it even much more dramatic.
Professional educators

Although autonomous, self-directed, technology-supported learning will become far more prevalent in the future, learning is a social experience that happens through interactions between the learner and other people, including peers, educators, tutors, mentors and coaches. Teachers are professionals who design and engineer learning environments and learning processes, and support learning through a variety of professional interventions. They need deep knowledge and understanding of the content which they teach and how we learn. They need to know how to support learning through instruction, facilitation and coaching. Teachers also constitute a major part of the education workforce and as front-line professionals of the system they embody a large amount of academic and experiential knowledge.

Developing teachers as a profession is an important public policy objective. This includes recruiting and retaining effective teachers; providing them with initial education and continuing professional development; offering induction and mentoring when entering the profession; establishing attractive career structures with appropriate financial compensation; regulating working conditions; and safeguarding the attractiveness and reputation of, and the social trust in, the teaching profession. At the same time, modern education systems need to better recognise and articulate the roles and functions of other educators in the system, whether trainers, coaches or other professionals in workplaces, or tutors and peers in self-organised communities of learners.

Educational institutions

Societies still rely heavily on specific institutional environments such as schools (including early childhood education centres, universities, vocational education centres, adult education centres, etc.) to provide the space and time for learning. Maintaining and improving the institutional framework in education is an important task for public policy, although that does not necessarily mean that public authorities provide or own educational institutions. Together with many other actors and stakeholders, public authorities are responsible for ensuring high-quality and equitable learning environments in a cost-effective and innovation-friendly way.

Education systems

Improving quality, equity, efficiency and innovation in education systems is critically important though many countries face mounting obstacles and challenges. Outdated physical infrastructure originating from the early days of educational expansion constrains modern forms of learning and needs to be renovated and reconstructed. Cost-efficiency becomes a major issue for systems that struggle to improve productivity, leading to rising costs per learner. Education systems will have to draw lessons from the COVID-19 experience to redesign education in a more cost-effective and efficient way through smart combinations of school-based learning and alternative delivery modes.
The following sections discuss some mid- and long-term possibilities for future-oriented international collaboration in education. First, the paper discusses three important concepts to guide reflection on the future of education. The three concepts constitute the space in which new avenues for international collaboration can be developed. Next, three conditions for future-oriented work in education are considered. Successful moves to innovative and future-oriented international work in education hinge on progress made in these three conditions. Finally, two central imperatives for policy development are presented.

The following graphic depicts the interrelationships among the eight components.

Three concepts to guide reflection on the future of education and learning

1. **Approach learning in an integrated and balanced way**

   The concept of formal education is closely connected to ideas of cognitive development and knowledge transfer. For a long time, these functions constituted the essence of schooling but this idea has come under pressure in the last decades. It is not abstract knowledge, as such, but what learners can do with it that is now essential. The success of the Programme for International Student Assessment (PISA) and its
adult counterpart, the Programme for the International Assessment of Adult Competencies (PIAAC), is largely due to their analytical and assessment frameworks, which put real-world competency in applying and using cognitive skills front and centre. Work on adult learning across the life course has further reinforced the idea that learning should be relevant to work, social participation and real life. Competency-based education has proven to be an important correction to an educational paradigm dominated by the reproduction of subject-matter knowledge.

At the same time, neuroscientific research on learning also demonstrates that competencies are built on solid background knowledge. Smart memorisation and retrieval practice are shown to be very effective in fostering the mastery of subject areas. Finding the right balance between subject knowledge and the thinking skills that underlie and frame the disciplines will remain an important challenge for education, as it is for PISA and PIAAC. There is much to gain from sharing experiences with curriculum design and implementation internationally.

In recent years, the OECD has expanded and strengthened its assessments of learning outcomes by including other essential domains of learning beyond proficiency in core academic domains. In 2015, PISA provided the first international assessment of social skills, measured as collaborative problem-solving. Thanks in part to the OECD’s pioneering work on this topic, the idea that social and emotional learning is as important as the development of cognitive domains is gaining traction. The results of OECD’s Survey of Social and Emotional Skills (SSES) have provided the first international comparative data on social and emotional learning. It is an example of the OECD leading international collaboration in a still contested field.

The development of social and emotional skills is a shared responsibility of families, communities, peer networks and, for good reason, schools. In some systems, the harmonious development of a person’s character is considered an important purpose of public education while in other systems it is still contested that public schools have a role to play in this domain. But schools will not be able to do this alone. Even more than cognitive
skills, the development of social skills happens through the interplay between various sites and spaces of learning. Experiences in after-school leisure activities, sports, community life, volunteering, etc. interact with what families and schools “teach” children and young people.

The move to include social and emotional learning alongside disciplinary content in OECD’s education work is an important development. The pandemic will be a decisive moment in moving the agenda on social and emotional learning forward. When schools had to drastically change their ways of working, students with well-developed resilience, perseverance, achievement motivation and self-control had a distinct advantage. Societies’ responses to the crisis called upon citizen’s empathy, trust and responsibility. Research on what made some countries more successful than others in managing and containing the virus still has to come to conclusive findings but the behavioural responses of citizens, driven by their optimism, trust and resilience may well be key factors. It will be important to work with countries in addressing these and many other issues in the domain of social and emotional learning. This is an important and strategic area of work for the near and mid-term future.

Yet knowledge, skills and character do not constitute the full universe of human learning. Ethical development through the integration of values and moral norms is an essential dimension of learning as well. Even though some countries have given values significant space in curriculum design, this is still largely uncharted territory in our understanding of human learning – and how formal and informal learning environments influence it. Values have a cognitive component. Caring about climate change for example and developing the sense of urgency to take personal action requires a good understanding of the environmental science, especially since the dramatic consequences of climate change are situated in a still distant future. But beyond climate change and the pandemic, social cohesion and global collaboration will also call for human capabilities to reconcile personal and social objectives, and immediate and more distant costs and benefits. How cognitive and non-cognitive building blocks crystallise in the development of strong and durable ethical values and norms is a question requiring further analysis. Several social and emotional skills are building blocks of values, such as empathy, trust in others, responsibility and tolerance. PISA’s assessment of global competence in 2018, for example, demonstrated the relationship between the social and emotional dimensions of how young people see and value other cultures, and learn how to engage in fruitful intercultural dialogue.

Artificial intelligence (AI) also generates fundamental questions about the purpose of education. AI is forcing us to redefine what is human about human learning and development. Understanding better the complementarity between the capabilities of computers and humans will have major consequences for deciding what learners should learn. What are the domains of human activity that will not or should not be taken on by smart machines and algorithms? When many productive skills will be replaced by computers, which areas will remain “human”? What about everyday ethical decision-making, the passing of legal judgments by judges, the diagnosis of a medical doctor based on incomplete and sometime contradictory evidence, or the esthetical eye of an artist? How should we redesign what students learn in an AI-driven world so that they blossom and flourish? Will artificial intelligence finally provide education with the opportunity to concentrate on what makes humans truly human? The OECD can monitor, assess and anticipate this development, and put forward a vision of how human learning will remain important for securing future growth, prosperity, social progress and the overall quality of life.

At the same time, AI will also fundamentally change the ways, the channels and the processes through which we learn. We should harness the power of AI, big data and learning analytics to provide more tailored and individual learning at scale. Digital technologies and AI have the potential of fundamentally transforming education and vastly improving its productivity.

Ultimately, learning results in behavioural change and that is when learning becomes socially relevant – when knowledge, skills, character, attitudes and values are mobilised in real-life conditions. This process does not happen automatically. We see in everyday life that people with highly developed cognitive and non-cognitive abilities can behave differently than what could be expected. The phenomenon of cognitive dissonance, for example, is well documented but there are many other instances in which people do not translate what they acquire internally into behavioural change when faced with real challenges. If we want to advise countries on how education in its different dimensions can contribute to solving today’s and tomorrow’s challenges, we cannot merely analyse comparative strengths in cognitive, social-emotional or ethical skills. We need to understand how education can bring these various dimensions together to bring about actual behavioural change. This is what agency is about, and why agency and co-agency are such central concepts in modern education. In the medium and long term, climate change may require large-scale behavioural change and the willingness of people to strike a different balance between current needs and the future well-being of the planet. Education can lay the foundations for this.
## Possible propositions

- Continue to broaden the assessment of learning outcomes to domains of social and emotional learning and discern lessons on how to improve those outcomes.
- Explore the possibilities of the assessment of value development and ethical learning, and discern lessons on how to improve those outcomes.
- Assess and anticipate the capabilities of computers, robots and AI against human skills, and establish implications for curriculum design and development.
- Ensure that the assessment of learning outcomes lead to recommendations for educational policy and practice and curriculum development that are framed in a holistic and balanced view on learning.

### 2. Make lifelong learning the guiding concept

In an age where the volume of knowledge is growing exponentially, some knowledge becomes quickly obsolete. And, as the demand for skills changes, the idea that what one learns at school can last for a lifetime becomes a dangerous myth. The concept of lifelong learning is not new and has been part of the policy discourse for more than half a century but it became mired in rhetoric with few implications for policy and practice. This needs to change, especially with the pressures that digitalisation and artificial intelligence exert on the nature of jobs and what happens at the workplace. We know that digitalisation is enabling skills development and incentivising workers to upgrade their skills sets. Experts expect the pandemic to accelerate the reallocation of labour between economic sectors with important consequences for up- and reskilling.

The need to learn is also going to increase because of the increased complexity of societies and our daily life, the exigencies of social participation and the demands of citizenship. The growing demand for language learning or digital skills acquisition does not only serve job-related needs but is also motivated by many other drivers from tourism to civic integration. From a lifelong learning perspective, the distinction between job-related learning and people’s motivation to learn because of social, cultural or personal considerations is blurring.

Implementing lifelong learning will require more than expanding opportunities for adult learning; it will push systems to fundamentally rethink the timing and sequencing of education and skills development over the life course. This includes the earliest stages of learning, which frame learner engagement in subsequent stages. Learning trajectories will become more complex for people of all ages, requiring more sophisticated support arrangements. Establishing what individuals learn best at what stage in their life and how to distribute learning opportunities and resources over the lifecycle will become key policy paradigms.

The concept of lifelong learning urges us to rethink learning biographies and the appropriate architecture of educational systems. Some critical learning happens best early in the life course. Neuroscience and work on early childhood education have convincingly demonstrated that early investments have many positive effects later in life, and that limiting learning opportunities can cause irreversible damage. For learning to be effective later in life, it must rest on a solid foundation acquired early.

However, laying the foundation for lifelong learning does not imply concentrating all learning in the first quarter of a lifetime. Front-loaded educational biographies need to evolve into more complex and more diversified learning trajectories throughout life with learning integrated into work and other contexts. However, employment policies, compensation systems and social security arrangements still very much rely on the standard learning biography. The idea that credentials hold for a lifetime will need to give way to an approach whereby the relevant knowledge, skills, attitudes and values individuals currently demonstrate become visible. Many more fundamental ideas about the way we organise education today deserve an overhaul as well.

Qualifications and credentials are an important feature of modern education systems. In the industrial age, they functioned as adequate gatekeepers of successful educational trajectories, entry points to the labour market and access to professions. They also served as indicators of educational attainment, markers of social mobility and providers of guaranteed, lifetime access to specific economic privileges and social status. In tomorrow’s knowledge economies, where digitalisation and AI drive constant professional mobility and changing skill demand, certification at any specific stage of education will lose its relevance. Today, close to 40% of workers in OECD countries already work in a field other than their field of study. There are significant signs that employers are starting to devalue qualifications that reflect on past attainment in favour of direct assessments of the knowledge, skills, attitudes and values they see as important and that workers can currently demonstrate.

The fragmentation of standard educational trajectories, the spread of modularisation, the increase in part-time learning and dual learning experiences, and the emergence of new forms of assessment and certification (microcredentials, nano-degrees, digital badges, etc.)

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The fragmentation of standard educational trajectories, the spread of modularisation, the increase in part-time learning and dual learning experiences, and the emergence of new forms of assessment and certification (microcredentials, nano-degrees, digital badges, etc.)
all point in the same direction. The diversification of learning modes and channels during the pandemic is also reinforcing the need to look again at credentialing, including recognition and accreditation arrangements of non-formal, informal and prior learning. These important transformations call fundamental characteristics of today’s educational systems into question.

Assessing learning outcomes is a major component of the OECD’s work in education and an important generator of data, comparative indicators, analysis and policy advice. The design and planning of learning outcomes assessments should be based on a comprehensive and integrated understanding of the learning biography. Currently, OECD data collections concentrate on the end of compulsory schooling (15 years old in PISA) and adulthood (16-64 years old in the Survey of Adult Skills, PIAAC). A first assessment of learning outcomes and child well-being at the age of 5 has also been piloted. An assessment of social and emotional skills of 10- and 15-year-olds is under development. Not all the answers will come from new international data. Instead, international collaboration on frameworks that allow countries to use and compare national data on learning outcomes could play an important role.

All countries are increasingly confronted with these challenges and questions. To overcome them, they will need to redesign their education systems around the concept of lifelong learning by introducing more flexibility in learning trajectories, new assessment and credentialing arrangements, and by tearing down barriers between the worlds of working and learning. Funding arrangements will have to be reconsidered to ensure that individuals, the business sector and governments share the costs and benefits of learning equitably. These funding arrangements will need to account for private investment and equitable access of citizens to publicly funded volumes of education even if learned in different ways and at different stages of the lifecycle. The similarity and complexity of these challenges provide a space for multilateral collaboration, exchange of policy experiences and international monitoring of policy outcomes.

**Possible propositions**

- Improve understanding of the changing nature of learning biographies and their diversity in various economic, social and cultural contexts.
- Prioritise education work on the critically sensitive stages of the learning biography, such as early learning and learning at the most important transitions.
- Develop a well thought out view on the timing of OECD assessments of learning outcomes over the life course.
- Support countries in policy efforts to move from rewarding educational attainment to rewarding skills as well.
- Provide opportunities for peer learning and policy advice on improving the flexibility of education systems with regard to access, learning progress and certification.
- Stimulate reflection among countries on the reallocation of public funding mechanisms to support a more equitable distribution over the life-course.

### 3. Assess the full scope of societal outcomes of learning

The OECD’s work in education has been fuelled by the idea that education is a worthwhile investment that pays dividends over time. This idea has also driven educational expansion over the past decades. Analyses of economic and social returns to education in both employability and earnings lend important support to this narrative on education and learning. However, signs that the standard human capital theory argument is reaching its limits should be taken seriously. There will be a growing need to critically reassess the economic and social outcomes of education. The economic benefits of tertiary graduates, for example, are measured as relative benefits but remain significant mainly because the benefits for the comparison category of upper secondary graduates are decreasing in absolute terms due to polarisation trends on labour markets. In several OECD countries, the saturation of graduate employment, over-qualification, substituting effects and qualification mismatch signal a fundamental change in the relationship between credentials and economic outcomes. In some systems, vocational and technical education already provides greater benefits for individuals, communities, regions and countries than a university-level education. Amid these trends, the standard human capital theory fails to offer sufficient analytical and explanatory power. Work is ongoing at the OECD to renew and update our framework of assessing the economic returns to education.

Massive educational expansion, increasing inputs of qualifications and skills in the workforce and the economy, and technological progress can be expected to have a stimulating effect on productivity. In most
OECD countries, however, productivity growth is low and, in some cases, stalling. A possible explanation is that the increasing number of tertiary-qualified people is not matched by equivalent growth in skills. Indeed, comparisons across the International Adult Literacy Survey (IALS), the Adult Literacy and Life-skills Survey (ALL) and the Survey of Adult Skills (PIAAC) suggest that in most countries average literacy and numeracy skills in the workforce have not increased while the share of people with advanced qualifications has grown significantly. Over-qualification, degree inflation and skills mismatch can offer a partial explanation for stalling productivity growth. Finding the right argument on the economic outcomes and benefits of education is a very important strategic challenge. If policy makers and, more importantly, learners, families and employers start to question the economic benefits of education, public trust and investment in education will erode.

Next to human capital as a predominantly economic good, education also produces social capital. Education not only produces individual knowledge, skills, attitudes and values but social norms, narratives and networks that relate individuals to others and keep societies together. Building social capital may become more important as societies become more fragmented, for example, through the impact of social media, which lock people into their own small bubbles.

In recent years, the OECD has put the social outcomes of education and learning on the map, marking one of its significant achievements in education. The positive association of educational attainment with health, political participation, volunteering, interpersonal trust and other social outcomes has been amply demonstrated and is widely accepted. Education is now appropriately seen as the main mechanism through which social opportunities and benefits are distributed. The other side of the coin is that education is contributing to the unequal distribution of social opportunities in health, social participation and many other relevant dimensions of quality of life. Unequal levels of social outcomes across the population are an indicator of inequality. At the macro level, it is now widely accepted that education positively contributes to overall social cohesion while also reinforcing trends of social segregation and fragmentation. The data collection, analysis and policy advice on the social outcomes and benefits of education as well as its contradictory effects on the unequal distribution of these outcomes remain a strategically important area of work.

Health outcomes of education are a particularly important issue in this regard. There is ample evidence that during the pandemic educational attainment and skills had a strong impact on the risk of being infected and on mortality risk. Health behaviour is a complex product of knowledge, cognitive and non-cognitive skills, values, and attitudes and, is thus, to a large extent, shaped by education and learning. Next to the direct outcomes on employability and life earnings are health outcomes of education. As one of the main pay back effects of educational investment, health outcomes are very relevant for public budgets.

Broadening beyond the economic outcomes of education has been a major achievement but the social outcomes that have been included in the OECD’s analysis so far give only a partial picture of social progress and quality of life. For example, environmentally sustainable behaviour, citizenship, empathy and various other desirable outcomes of education – to which the UN Sustainable Development Goal Target 4.7 refers – are high on the policy agenda but have so far attracted little empirical research. In many countries, other purposes of education such as nation building, identity development and the cultural assimilation of migrant populations are becoming important as well. Yet there is no conceptual framework to adequately map and classify the desired outcomes of education. This would allow for the development of an empirical research strategy.

**Possible propositions**

- In close collaboration with ECO, revise the analytical framework on the economic returns to education.
- Improve the understanding of the role of educational attainment and skills development in productivity growth.
- Strengthen the data collection and the analytical work on the social outcomes of education, in particular with regard to health and citizenship.
- What is the role for education in helping students ground their identities as part of a culture, community and/or country? What do belonging and community mean in this context of a hyperindividualism, fuelled, in part, by the technological capacity to personalise and individualise our lives? Building on PISA’s assessment of global competence, the OECD could explore new areas of education’s societal outcomes relevant to some of the OECD’s strategic or horizontal themes, such as health, civic engagement and environmental protection.
- While the role of education for some societal outcomes (health, political participation, etc.) is widely acknowledged, this is not yet the case for other social values like empathy and environmental attitudes, which have a cognitive basis. There is also a role for education in collective behavioural change, building collective knowledge and, even more importantly, building collective capacity and responsibility.
## Three conditions for future-oriented work in education

### 4. Improve the understanding of human learning

Compared with other public policy domains such as health, education has been slow in developing into a fully evidence-informed system. Some of the knowledge base used by teachers, school leaders and policy makers is outdated; educational research is limited in quantity and quality; and adequate mechanisms of knowledge transfer, dissemination and translation into policy and practice are underdeveloped. This has important consequences for the quality and efficiency of learning experiences, and for the productivity of educational investments. In past decades, education systems expanded without a full understanding of the best possible design of learning systems. For example, only recently have economists and psychologists come to understand the importance of supporting early learning with proper institutional pedagogical learning environments. Other areas of emerging importance include the science of language-learning and the development of numerical concepts. Age-old didactical approaches have come under scrutiny as our understanding of human learning processes has improved. Mobilising the best available research knowledge and evidence on learning, and translating it into policy-relevant insights and formats is important to improving and innovating education.

Recent technical advances in non-invasive brain research and new developments in neuroscience have opened up a new field of empirical research into the process of learning, one that is removed from the traditional spheres of education science. A new science of learning is emerging, based on the interdisciplinary integration of research in neuroscience, cognitive psychology and many related scientific disciplines, including AI. Important findings are emerging from this field, and many are attempting to translate these into educational policy and practice. However, we are only beginning to discover what happens in the brain when people learn, and as with every other new scientific discipline, the science of learning will likely take a long and bumpy road to full maturity. Yet there is no doubt that it will progressively alter and improve our understanding of human learning as well as our institutional approaches to learning in classrooms and schools.

One of the important domains of scientific research into human learning is that of the interplay between cognitive development, achievement motivation, growth mindset and well-being. In past years, student well-being has become an important dimension of schooling. Well-being is now seen as shaping the social and emotional conditions for learning to be effective and sustainable. When the social and psychological climate is not optimal, learning will suffer. In recent OECD work in education, considerable attention has gone into issues such as a positive school climate, supportive behaviours of teachers, and the negative impact of bullying in its many different forms, etc. Recent PISA work has also focused on achievement motivation, life satisfaction or the role of growth mindset, topics which also relate to the motivational and well-being conditions for learning.

Going forward, we can expect the research on learning to inspire new design principles of effective and supportive learning environments. Future learning environments will focus on developing learner agency, and will redefine the roles of teachers and educators. The science of learning can support collective reflection on this. Curriculum redesign will also benefit from new insights into human learning, including insights into the building blocks and sensitive periods of cognitive development. As in other scientific fields, there is a clear role for international collaboration to leverage this emerging knowledge.

### Possible propositions

- Support the translation of scientific progress in the understanding of human learning into educational policy and practice, more specifically with regard to education design principles, teachers’ professional knowledge, pedagogy and curriculum development.
- Strengthen the assessment of teachers’ professional knowledge as a key area in OECD work on teachers.
- Continue to integrate the social and emotional conditions for effective teaching and learning in the frameworks for assessing students’ learning outcomes.
- Consolidate a focus on well-being among students and teachers as an integral part of the educational experience and its effectiveness.
5. Go beyond formal education

Formal education in professionalised institutional settings is and, for the foreseeable future, may remain the most prevalent space for human learning. The reasons that human civilisations isolated learning environments in time and space have not disappeared. To a large degree, learning is more effective when it is concentrated and focused with strong support from educators and the right kinds of institutions. However, the prevalence of formal education should not blind us to the fact that most human learning happens outside formal settings. Most initial learning, for example, happens in families and communities. The power of social background in explaining learning outcomes at the age of 15 is a partial measure of the richness of prior learning within and beyond school. Meaningful experiences outside formal settings reinforce and complement what students learn at school. Experiential learning makes formal learning real and imbues it with meaning. Do children develop spatial thinking through learning geometry at school, through games played at home, or by simply walking to school and navigating the complexity of the city they live in? Modern education systems will need to embrace this broader range of learning opportunities in their design and articulate them with learning in the institutional sector.

Schools themselves provide many opportunities for informal learning. Not all learning that takes place at school is by definition “formal”. Think of the impact of the supportive attitudes and caring behaviour of teachers on the development of a person's interpersonal trust and empathy. Sports, extra-curricular activities, what happens at playgrounds, and so on have great impact on children's learning and well-being.

Making sense of non-formal and informal learning is far from easy, and requires revising data-collection and analytical instruments, as well as conceptual frameworks. Work on vocational education and training (VET) is examining the ways through which workplace training and informal learning relate to formal education. Work on ECEC focuses on learning environments that do not really fit the distinction between formal and non-formal. Ongoing work on the assessment of social and emotional skills aims to disentangle the roles of families, community life and schools in fostering those skills. International collaboration needs to go further in this. Concepts such as learner agency, learning biographies and, of course, lifelong learning suggest that learners develop knowledge, skills, attitudes and values through integrating experiences from a wide range of life settings.

Informal learning is a vast but largely uncharted territory. We know little about where and the ways through which people learn, and even less about how to make improving informal learning subject to public policy. However, there are some promising advances in this sphere. We know that the quality of work and workplaces has a positive impact on learning and skills development at work. Data from the Survey of Adult Skills also show how technology intensity of workplaces relates positively to the prevalence of learning and collaboration. Collaborative cultures and working conditions that reward collaboration allow people to learn from one another. Other examples from the fields of architecture and urban planning further underscore the importance of informal learning. Interacting with physical environments, moving around, navigating complex environments and travelling to other destinations all have an effect on cognitive and non-cognitive development. We know, for example, that certain housing conditions, urban environments and physical landscapes trigger problematic behaviour while others have positive effects. There is also significant research on the impact of media, digital devices and social media in the private sphere on learning. With many people being restricted to their homes it is likely that informal learning has increased during the pandemic. In fact, early indications of education-related searches on the Internet in looking at Google search data suggest that there has been an increase in informal learning. Turning this knowledge into policy advice on fostering desirable informal learning is not easy but it remains a promising domain of future work. Insights from behavioural economics on nudging specific behaviours can provide interesting ideas as well. Since investments in infrastructure are rare, it is often difficult for jurisdictions to build systematic experience, underscoring the importance of international knowledge-sharing.

Possible propositions

- In assessing students’ learning outcomes, improve the understanding of the contributions of diverse channels and environments of learning.
- Improve the understanding of schools as sites that provide formal as well as informal opportunities to learn in order to develop policy advice on how to better shape schools as positive learning environments.
- Enable education systems to reinforce connections between formal schooling and non-formal and informal channels of learning in the community, civic organisations and the media.
- Reinforce an approach to digitalisation as expanding opportunities for non-formal and informal learning.
6. Develop a new approach to equity and inclusion in education

Equity in education and learning is very high on the policy agenda, and for good reason. Although educational expansion has opened up opportunities for many more students, school systems still discriminate and segregate. Family background affects educational trajectories, success and failure, and the place of individuals in social hierarchies. This contrasts with one of the basic tenets of educational expansion: the belief that talent, effort and merit lead to upward social mobility. Equitable education systems are those that ensure that students’ personal and social circumstances, including factors such as gender, ethnic origin, immigrant status, and special education needs, do not determine their achievement of educational potential. Education, however, has not fully embraced an inclusive approach that recognises learner diversity and accomplishes success for all. In a knowledge-driven economy, the macro-social cost of educational exclusion is very high, because of wasted talent and the future cost of educational failure for social welfare and protection systems. In this context, the concept of inclusion in education has started to gain prominence in academic and policy debates. Inclusive education systems are those that reach out to all students by responding to the diversity of their needs and ultimately ensuring the self-worth and sense of belonging of individuals to communities.

So far, discussions around equity in education have predominantly focused on the impact of gender, socio-economic background, parental education, parental occupation and cultural capital (e.g., PISA) or parental educational status (e.g., PIAAC) on educational achievement or learning outcomes. The underlying argument is that the economic, social, cultural and educational resources that parents or peers are able to mobilise exert an important influence on a child’s opportunities to benefit from learning at school either directly or indirectly through the quality of the school’s resources, thereby influencing their learning outcomes.

This approach needs broadening to encompass a wider range of dimensions such as gender stereotypes, social and cultural backgrounds, migration history, geography or age and their intersections. Gender roles and stereotypes play a very important role in influencing the educational and occupational choices of girls and boys. In many countries, girls still shy away from choosing educational tracks and occupations perceived as traditionally masculine such as STEM degree programmes. As educational opportunities increasingly concentrate in specific locations, spatial segregation plays an important role in driving educational opportunities. Beyond the obvious urban/rural divide, however, we actually know very little about the role that location and geography play, and how these factors interact with dimensions such as socio-economic status and migration status.

Furthermore, some experts argue that inequity in education is not only the outcome of structural characteristics of the educational system but of divergent strategic behaviours among social groups as well (e.g., opportunity-hoarding among the middle class). Other critics of analyses of inequality in educational outcomes argue that cognitive ability or intelligence is not accounted for. The axiom that individual variation in intelligence levels out at the aggregate level is increasingly challenged by scientific research that details the impact of genetics and very early (even prenatal) conditions on cognitive abilities. Any framework for equity also needs to acknowledge epigenetics – the fact that contexts for learning and development influence the expression of our genes (the share of genetic material that is expressed) and are related to the intelligences that humans develop. This has implications for learning, particularly at an early age. This suggests much more ample investments in educational settings serving students who have less educational investment in their homes and communities. This emerging academic debate has important policy implications. There is no country-level trade-off between excellence and equity according to PISA, and some countries have seen important progress in both raising performance and levelling the playing field. But underperformance and inequality have been persistent in other countries despite considerable policy action. We should therefore support a more complex debate on equity and inclusion.

Equity has risen further to the forefront during the pandemic. Whatever the assessment researchers make of the average learning loss and decline in students’ well-being induced by school closures, it is shown again and again that the inequality between students has increased. The lack of sufficient resources for home-schooling and distance education, the absence of Internet access and quiet places to study, the lack of effective digital tools, the deficiency in parental support and guidance, the absence of effective relationships between schools and families, and the lack of adequate professional support for teachers all contribute to the fact that disadvantaged and struggling students faced a difficult time. Beyond children and youth from low-income and single-parent families, diverse students are being strongly affected by the crisis. Immigrant, refugee, ethnic minority and indigenous students, and those with special education needs have suffered the deprivation of not only physical learning opportunities but the social and emotional support available in schools and extra services such as school meals. They risk falling further behind and becoming isolated. Wealthy families invested in compensatory efforts, and shadow education and private tutoring have significantly expanded during the crisis. However, these opportunities are much less within reach, financially and culturally, for less-affluent families. When education systems go back to normal operations, a major effort will be needed to remediate and compensate for lost opportunities, especially among students from disadvantaged backgrounds. Since this is a novel experience for most countries, learning from others about what works will be particularly relevant.
Two imperatives for policy development in education

7. Improving cost-efficiency in education

The budgetary challenges that countries increasingly face today will not go away. Public expenses in education and other domains are fuelled by increasing levels of public debt, which tax future generations. Demographic shifts will push governments to spend more on health, ageing and welfare. Challenges related to climate change will require higher levels of public spending as well. Pressures to increase value-for-money and cost-efficiency in education are likely to mount, and education systems are not properly equipped to respond. Worse, costs appear to be inflating. Most OECD countries have increased their educational expenditure significantly over the past 20 years without, in most cases, any perceivable improvement in commonly measured outcomes. Some of the additional expenditure has gone to initiatives such as lowering class size, which had no demonstrable effect on educational outcomes. Whereas other public policy domains have increased productivity mostly through the targeted use of technology, the technology-driven increase in educational productivity has yet to materialise.

The cocktail of inflating costs, flat productivity, stalling or decreasing quality, questionable economic returns on investment, and external pressures for cost-efficiency risks creating a significant challenge for education systems. It is another area where the causal nature of relationships between inputs, processes and outcomes is difficult to discern but where cross-national differences in educational productivity can yield important insights for public policy. Improving cost-efficiency is an important area of policy-relevant work. Multilateral collaboration can provide the space for analysis, peer learning and policy dialogue.

Possible propositions

- Work with countries to explore ways of increasing cost-efficiency in education.
- Develop policy alternatives for spending decisions that improve value-for-money.

8. Focus resolutely on innovation of education

When education systems come under increased pressure, they sometimes provide less space for experimentation and innovation and go back to what worked in the past. The reasons for that are many. There is often uncertainty about who will benefit from reforms and to what extent. This uncertainty is acute in education because of the range of people involved, including students, parents, teachers, employers and trade unions. Uncertainty about costs is problematic because education infrastructure is large and involves multiple levels of government, each often trying to minimise or shift the costs of reform. Assessing the relative costs and benefits of reform in education is also difficult because of the large number of intervening factors that can influence the nature, size and distribution of any improvements. The investment may be expensive over the long term while in the short term it is rarely possible to predict clear, identifiable results from new policies, especially given the time lags between implementation and effect.

Possible propositions

- Develop a more complete analysis on equity and inclusion in education.
- Continue to chart the different ways (from structural characteristics to prejudices) learning opportunities are not distributed fairly and specific categories of students are excluded in order to better advise countries on how to improve equity and inclusion in their systems.
- Look into inclusive practices in addition to equal opportunity and intersectionality as a key to understanding educational opportunity in increasingly diverse societies. The OECD can frame the discussion and contribute to creating a common language. Can we think of ways to support educational inclusion across countries?
- Ensure that tech innovations are deliberately designed to compensate for structural inequalities within societies so that they do not worsen pre-existing gaps between more and less advantaged groups.
- Review the effectiveness of pro-equity policies and practices in education, and promote peer learning among countries on innovative policy approaches.
The potential loss of advantages or privileged positions is of particular importance in educational change because the vast structure of established, usually public, providers means that there are extensive vested interests. As a result, the status quo has many protectors – stakeholders in education who stand to lose a degree of power or influence if changes are made. It is difficult to ask the frogs to clear the swamp. Even small reforms can involve massive reallocations of resources, and touch the lives of millions. This rules out “reform by stealth” and makes it essential to have broad political support for any proposed reform. In essence, education reform will not happen unless educators implement and own it.

Education ministries have been at the frontline of some of the most visible public policy reforms on issues related to improving the quality and status of teachers, strengthening accountability, ensuring sufficient school places, and controlling and financing higher education. Education policy makers know only too well the difficulty of securing stable financing for expanding tertiary education, whether by reallocating funding from other areas of public expenditure or imposing tuition fees. Reforms that entail more testing of students often encounter resistance from teachers; reforms to vocational education might be resisted by parents who are sceptical about the promised benefits.

However, the case for innovation in education is clear. By reconfiguring the spaces, time, people and technologies, education systems can improve outcomes, cost-efficiency and equity. Already, the pandemic has given more leeway to innovation on the ground. There are now also more examples of education systems that set guidelines or standards at the national level and give freedom to schools or local authorities to shape their own responses. This can give rise to greater innovativeness in education in improving outcomes, cost-efficiency and equity.

But not every change is innovative. The direction of change matters as well as the overall purpose with which it is implemented. Being more rigorous about innovation is important, not least because of the many mistakes that have been made under the banner of innovation. Too much change in education has been counterproductive. When it is not rooted in the science of learning and is counterintuitive to teaching professionals as a result, innovation fatigue sets in. There is growing resistance among teachers against innovations that are implemented in a top-down fashion. As has become clear, the implementation of reform and innovation requires great care. Innovation for learning as we understand it from the growing science should be the North Star and not change for the sake of change.

Technology has great potential to drive innovation in education, as it does in other systems. So far, however, the implementation of digital technologies in education and learning has served more to conserve existing practice than to transform it. There are several reasons for this: simplistic approaches, an absence of scientific pedagogical input in the design of software and courseware, unfulfilled primary conditions, etc. The pandemic has shown that education systems and learners pay a high price for a digital transformation process still in its infancy. When schools closed and teachers had to shift to distance education, they could not easily shift to well-established digital platforms, courseware and assessment systems. Many had to reinvent the wheel all by themselves. Even after almost a year into the pandemic, there are only a handful of countries that have managed to successfully integrate digital technologies into education. Important lessons will need to be learned by countries in this regard. At the same time, it has also shown the capacity of education systems to innovate using technology.

Education systems are already moving towards greater flexibility and differentiation, and this trend will only accelerate because of the pandemic. Digital learning tools can enable schools to provide specific solutions to highly diversified needs. When recovering from the pandemic students will need to receive adequate remediation and support. Digital tools will be extremely valuable.

We need a more sophisticated perspective on the ways in which innovation arises in education. The idea that policy makers and legislators generate innovation through top-down interventions has often failed. Successful innovations depend on a collaborative effort from all actors and stakeholders both inside and outside the system, united by a convincing narrative and sense of purpose. The professionals at the frontline of educational delivery are critically important to the success of innovations. They need to be part of the design process of innovation, not least because innovations are often unsuccessful due to mechanisms that implicitly or explicitly disempower teachers. Successful innovations in education often rely on strong horizontal professional collaboration and accountability within the profession. Again, this seems an important space for multilateral collaboration.

A powerful knowledge system informed by scientific research, and driven by data and analysis, is essential to developing the evidence base for policy, and guiding innovation and experimentation. At the same time, innovation and experimentation are only valuable when systems develop the capacity to learn from them, whether they be successes or failures. One of the most pressing issues towards the end and after the pandemic will be to evaluate how systems have responded and to draw lessons from the experiences. After all, the pandemic was a live experiment and its toll can only be compensated for, if only in the most infinitesimal way, by learning from it and doing better in the future.
Possible propositions

- Provide countries with a view on innovation in education as a collaborative intentional process of improvement towards more effectiveness, efficiency, quality and equity.
- Draw lessons from the COVID-19 pandemic to fundamentally rethink and innovate education systems.
- Stimulate countries to generate experimentation spaces in education from which countries can learn, both from successes and failures.