

OECD Future of Education and Skills 2030 project background



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How can we prepare students for jobs that have not yet been created, to tackle societal challenges that we cannot yet imagine, and to use technologies that have not yet been invented? How can we equip them to thrive in an interconnected world where they need to understand and appreciate different perspectives and worldviews, interact respectfully with others, and take responsible action toward sustainability and collective well-being?

The future, by definition, is unpredictable; but by being attuned to some of the trends now sweeping across the world (OECD, 2019^[1]) we can learn – and help our children learn – to adapt to, thrive in and even shape whatever the future holds. Students need support in developing not only knowledge and skills but also attitudes and values, which can guide them towards ethical and responsible actions. At the same time, they need opportunities to develop their creative ingenuity to help propel humanity towards a bright future.

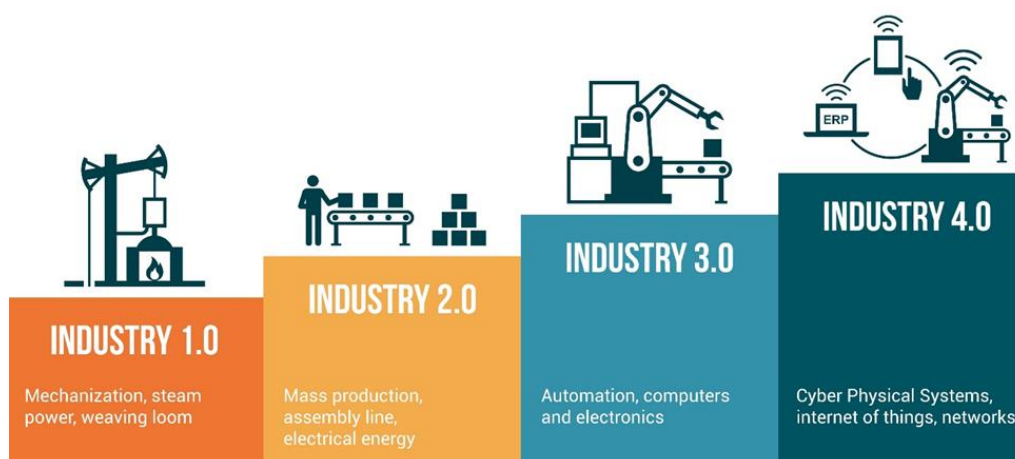
As Andreas Schleicher, Director of the OECD Directorate for Education and Skills, commented in 2019, “Education is no longer about teaching students something alone; it is more important to be teaching them to develop a reliable compass and the navigation tools to find their own way in a world that is increasingly complex, volatile and uncertain. Our imagination, awareness, knowledge, skills and, most important, our common values, intellectual and moral maturity, and sense of responsibility is what will guide us for the world to become a better place” (Schleicher, 2019^[2]).

Change – even rapid change – is part of life; it can be both a source of inequality and an opportunity to eliminate inequities. The Industrial Revolution of the 1800s, for example, created a divide between those who benefited from the revolution and those who did not. As a result, there was a period of “social pain” at the societal level.

However, with the advent of universal, compulsory public schooling, access to education improved. Thus, more people could both contribute to and benefit from the industrial revolution; a time of “prosperity” followed a time of “social pain” (Goldin and Katz, 2010^[3]).

This first Industrial Revolution was followed by several others. For example, in 2011, the German government inaugurated an Industry 4.0 strategy, proposing to move from “centralised” to “decentralised” smart manufacturing and production methods, blending the worlds of production and network connectivity in an “Internet of Things”. The strategy called for creating a “smart industry” in which people, devices, objects and systems combine to form dynamic, self-organising networks of production (Figure 1, next page; (Germany Trade and Invest (GTAI), 2019^[4])).

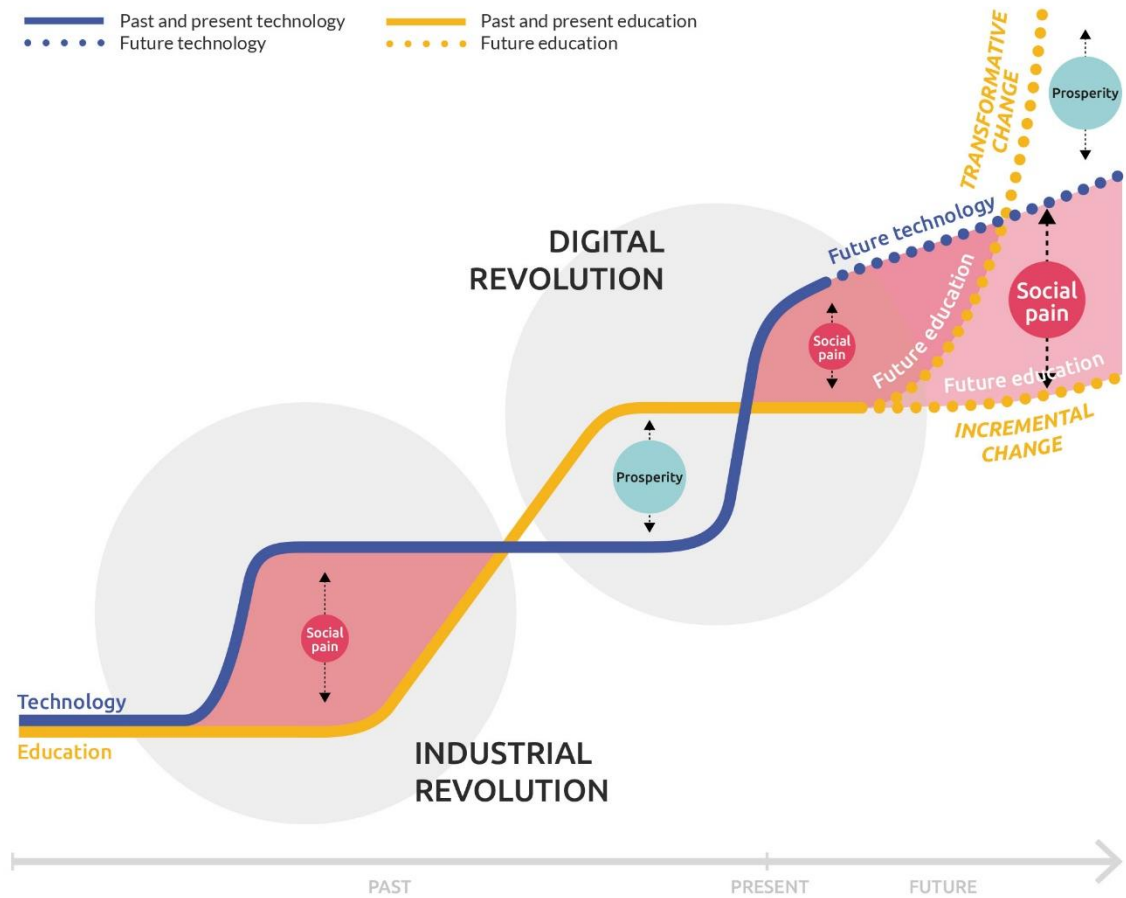
Figure 1. Industry 1.0 to 4.0



Source: McLellan (2018^[5]).

As governments like Germany overhaul their economic strategies in the face of unprecedented challenges, including an exponentially faster rate of technological change, meaningful and relevant changes in education are urgently needed to achieve more inclusive and sustainable development for all, not just for the privileged few. Ethical questions about how to harness the knowledge and skills we possess to create new products and opportunities loom large. To shorten the period of “social pain” and maximise the period of “prosperity” for all, education systems need to undergo transformative change too (Figure 2).

Figure 2. The race between technology and education

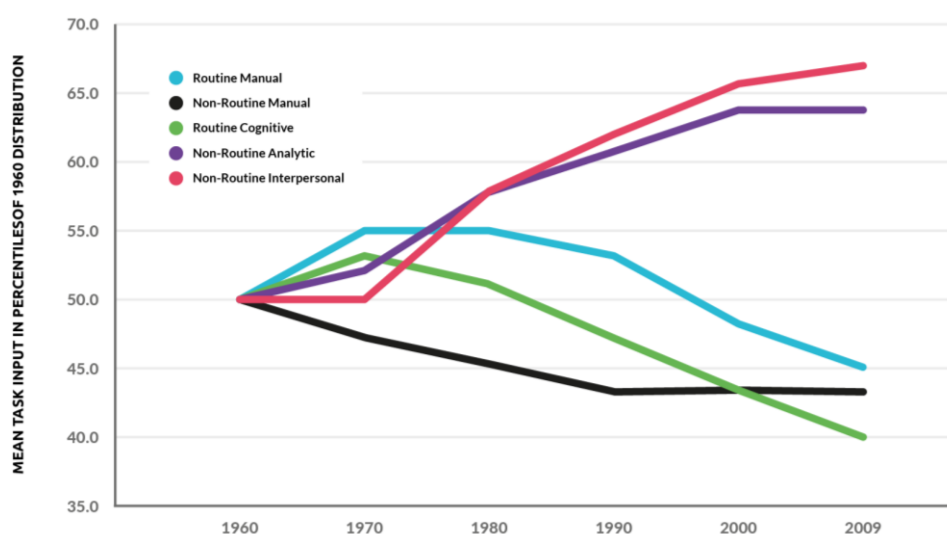


Source: Inspired by “The race between technology and education”, Goldin and Katz (2010^[3]).

For education to keep abreast with technological and other social and economic changes, we must first recognise what computers are good at and what they are not good at. Computers, including Artificial Intelligence, are not as good as humans at abstract tasks, manual tasks, tasks requiring complex contextual information and tasks requiring ethical judgements (Luckin and Issroff, 2018^[6]; Autor and Price, 2013^[7]). They are, however, good at routine manual, non-routine manual and routine cognitive tasks.

Due, in part, to these changes, the nature of work has also changed over the past half-century. Since 1960, people spend considerably more of their working hours doing non-routine tasks that require higher-order, analytical thinking and interpersonal skills (Figure 3). This is just one of the many shifts taking place in social and economic spheres. As a result, our relationships with work, with each other, and with our environment also need to shift.

Figure 3. Change since 1960 in prevalence of types of tasks required for work



Note: This figure shows how the task composition performed by US workers has changed from 1960 to 2009.
Source: Autor and Price (2013) in Bialik and Fadel (2018^[8]), p.7.

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As these questions and concerns about unprecedented social, economic and social challenges became increasingly urgent, the OECD Education Policy Committee in 2015 recognised the importance of stepping back and looking at the bigger picture – the longer-term challenges facing education – even as policy makers were busy with more immediate policy concerns.

At the same time, the Committee recognised the need to make the process of curriculum design and development more evidence-based and systematic. Learners, rather than political preferences, needed to be placed firmly at the heart of curriculum change.

As a response, the OECD launched the Future of Education and Skills 2030 project in 2015 with the aim of helping countries prepare their education systems for the future. Stakeholders agreed that the project would focus:

- in the **first phase (2015-19)**, on “what” questions – what kinds of competencies (knowledge, skills, attitudes and values) today’s students need to thrive in and shape the future for better lives and for individual and societal well-being
- in the **second phase (2019 and beyond)**, on “how” questions – how to design learning environments that can nurture such competencies, i.e. how to implement curricula effectively.

Policy makers, researchers, school leaders, teachers, students and social partners from around the world worked together with the OECD from 2016 to 2018 to co-develop a vision of education and a learning framework that sets out the types of competencies today’s students need to thrive in and shape their future.

Although the project focuses on secondary education as a starting point, it recognises the importance of all levels of formal and informal education, and of lifelong learning, and the applicability of project principles to all levels of learning. The framework can thus serve as a common language to build a shared understanding – from the local to the global level – that every learner, no matter his or her age or background, can develop as a whole person, fulfil his or her potential, and participate in shaping a future that improves the well-being of individuals, communities and the planet.

Such a shared language can also facilitate comparisons and learning across a wide range of education systems. With a shared learning framework, stakeholders can communicate with each other, and learn about and compare best practices. The OECD Future of Education and Skills 2030, in other words, stimulates a discussion we need to have now (Schleicher, 2018^[9]).

How education systems have (or have not) evolved in response to demands from societies

Some education experts have noted that most 21st-century students are still being taught by teachers using 20th-century pedagogical practices in 19th-century school organisations (Schleicher, 2018^[9]) (Table 1).

19th century



The 19th century was an age of civil wars, colonialism and imperialism. The natural environment – water, air, soil and minerals – was seen as the source of economic growth. Nature was thus viewed as something for humans to exploit in order to produce goods and services.

With these natural resources and the inventions that sparked the first Industrial Revolution, including electricity, the flying shuttle and the water frame, new industries, such as the textile industry, flourished. Mass production, based on assembly lines and the division of labour, became possible. For those who had access to capital, such as land, labour and money, profit making became the goal. Hierarchical decision making was seen as the most efficient.

With economic growth, standards of living and average income improved; and with the introduction of universal public schooling, more people benefitted from the gains of the industrial revolution. However, schooling was modelled to respond to societal demands for

labour, and thus the goal of education was largely to prepare students for jobs. Teaching was also made “efficient”: in mass education, one teacher was to teach as many students as possible with standardised content. Thus, the curriculum model that matched the demands of the labour market was static, linear and standardised.

20th century



The 20th century was marked by two world wars and the restoration of independence for many nations after a period of colonialism and imperialism. Thus, autonomy, liberation and independence became human and societal aspirations. Late in the century, it was also the age of the Internet, when new industries and jobs in computers, electronics and finance were created, and when the automation of manual tasks accelerated.

It was a time of competition among businesses. Competition for land resulted in ecological destruction, including deforestation, water depletion, and the extinction of many species. Population growth added more pressure to already stretched natural resources. Social awareness about the need to protect the environment grew along with the existential threat posed by climate change. The concept of “corporate social responsibility” was promoted during this period. Humans were seen as “capital”, or as the subject of investment, rather than as “labour” to exploit.

Expectations for work organisation changed accordingly. To be more efficient, some organisations delegated responsibilities for decision making to those who knew best the particular contexts for those decisions and, in turn, these decision makers were held accountable for outcomes.

Broader goals for education were set during this period. Education was not just about learning for jobs, but for individual fulfilment too. The scope of curricula widened to include non-academic subjects, such as physical education. The curriculum was still static, linear and standardised; and assessment through standardised testing was valued to ensure accountability. Schools were expected to be accountable for their outcomes. Teachers were increasingly expected to comply with standards ensuring that all students, regardless of their background, were provided equitable opportunities to learn.

21st century



So far, the 21st century is characterised by interdependence among nations facilitated by global communication, the decentralisation of power, which has been accelerated by social media, emerging nationalism, and increasing incidents of terrorism. Workplaces have become more flat, open, flexible and transparent; in organisations, teamwork is valued more highly than hierarchy.

It is also the age of accelerated technological innovations, such as cyber physical technology, social media, Artificial Intelligence, robotics, the Internet of Things and 3-D printing, among many others. These innovations bring both opportunities and challenges, including questions about ethics and morals. Social media has provided some businesses with new opportunities, and business models have shifted to include those based on a shared economy. Social entrepreneurship has broadened the discussion about businesses to include purpose. Some entrepreneurs consider the purpose of business to be not solely for making profits but for creating social value and solving society's most urgent problems. Businesses are moving from a model of "corporate social responsibility" to models of "creating shared values" (Moore, 2014_[10]).

But at the same time, challenges are also emerging: the use of big data threatens individual privacy; and the easy manipulation and creation of false data and stories, aided by digitalisation and social media, has spawned fake news and a "post-truth" era.

The paradigm has shifted so that the environment is viewed as a larger ecological system of which humans are merely a part. Humans are expected to co-exist with nature. Thus, a current aspiration is to ensure the well-being not only of humans but also of the planet.

To turn this vision into reality, everyone needs to take action. To move from the "division of labour" to "shared responsibility", everyone needs to have the skills, knowledge and the desire to contribute.

In the education sector, some changes are already emerging. Schools are no longer seen as closed entities in themselves, but as part of the larger eco-system in which they operate. Some schools collaborate with each other, forming networks or partnerships with other schools. Some schools have started to collaborate more widely with other organisations in their communities, such as scientific organisations, theatres, universities, social service organisations, technology companies and businesses, where teachers and students can become familiar with the skills and competencies that employers and other community members deem critical.

These schools aspire to operate with a curriculum that recognises the need for interdependence and broadens the goals of education to include "education for citizenship". Such a curriculum would recognise the differences between individual students, and

acknowledge that each student has different prior knowledge and skills, as well as different attitudes and values, and, therefore, may learn differently. Thus, curricula will have to be dynamic rather than static. They will have to allow for non-linear learning paths rather than expect all students to follow linear progressions along a single, standardised path. They will have to be more flexible and personalised to ensure that each student's unique talents are developed so that all students can realise their full potential.

Table 1. Comparison of society, industry and education across the 19th and 20th centuries, and the aspirational vision for the 21st century¹

	19th century	20th century	Vision for the 21st century
World events	Civil wars, racial segregation, colonialism and imperialism	World Wars I and II, independence of nation states, Cold War	Interdependence among national states, decentralisation of power, terrorist attacks, nationalism
Technological innovations	Electricity, telephone	Internet	Cyber physical technology (social media, AI, 3-D printing, robotics)
Main industry types and business climates	Oil industry, textile industry Mass production by machine Focus on profit making	Computers, electronics, financing Shift from manual to machines – automation Tailored production of goods and services for individual consumers Corporate social responsibility (CSR)	Social media, Internet of things, big data, digitalisation, post-truth (fake news) Shared economy, social entrepreneurship Consumers take part in the production of goods and services Focus on value making, sense making Corporate shift to creating shared value (CSV) and considering to contribute towards the UN Sustainable Development Goals (SDGs)
Environmental stewardship	Humans conquer nature Humans own nature (in particular, land) besides labour, capital as key factors of production	Humans begin to realize the need to protect nature (environmental conservation/ protection) Focusing on human capital	Humans co-exist with nature; humans are part the mother nature Focus on sustainable development Support green growth Nature is considered as one of the important capitals – natural capital, human capital, cultural capital and social capital.
Changes in society/life	Improved standards of living and average income	Globalisation, baby boom, increased access to information	Accelerated migration, urbanisation, longer life expectancy, falling fertility rate, growing inequality, depletion of natural resources, climate change
Work organisation	Division of labour – e.g. assembly in factories – assembly lines Hierarchical organisation	Transparency in organisation Organisation with delegation of responsibility and accountability	Transparency in organisation Organisation with delegation of responsibility and accountability as well as shared responsibility Flat organisation - Flat, open, flexible, transparent, and team-work oriented organisation
Work organisation in education and changes in compulsory schooling	Universal public schooling (primary and secondary education)	Emerging divergence of schooling (e.g. private, home schooling), Competition among schools	Emerging networks/partnerships of schools Emerging collaboration among schools Emerging collaboration between schools and communities at all levels, meta-, meso-, micro, capturing education system as part of a larger eco-system
Curriculum	Prepare for labour market; education for jobs Academic disciplines only (mathematics, language) Static, linear and standardised	Prepare for independence; education for individual fulfilment Widened scope (added physical education, other domains); Still static, linear and standardised	Preparing for interdependence; education for citizenship Balanced scope (breadth and depth) Non-linear, dynamic, flexible curricula; focus on more personalised learning

Note: For an animated version of this information visit www.youtube.com/watch?v=mLXvQKUS-Q.

Creating a “new normal” in education: A 21st-century model?

Today’s innovations often become tomorrow’s commonplace. The OECD Future of Education and Skills 2030 project has observed some innovative features of education systems that are just emerging but that may become the “new normal”² in tomorrow’s education systems, e.g. something which was previously uncommon has become commonplace (Table 2).

As mentioned above, while education systems have been thought of traditionally as independent entities, they are now being considered as part of a larger eco-system to which they contribute and by which they are influenced. In line with this shift, a sense of shared responsibility for the education system and stakeholder engagement has also evolved: decision-making is no longer controlled by a select group of people, rather it is shared among stakeholders of the education system, e.g. parents, employers, communities and students. Additionally, all stakeholders increasingly work together and assume responsibility for a student’s education, including the student. Rather than students being acted up by the education system, they have become active participants and change agents in the system alongside teachers and principals, and are learning to be responsible for their own learning.

Likewise, whereas student learning outcomes and academic achievements traditionally define the effectiveness and the quality of their school experience, student well-being and students’ learning experiences – the quality of “learning processes” – have risen in value and expanded the focus beyond “outcomes”.

Thus, approaches to curriculum design and learning progression is shifting from a “static, linear learning-progression model” to a “non-linear, dynamic model”, which recognises that each student has his/her own learning path and is equipped with different prior knowledge, skills and attitudes when he/she starts school. And, student assessment has thus also shifted from standardised testing only to different types of assessments for different purposes.

In line with these changes, the focus and purpose of monitoring education system performance have shifted from the traditional valuing of accountability and compliance to include valuing of continuous system improvement through feedback at all levels of the system.

Most importantly, the role of students in the education system is changing from participants in the classroom learning by listening to directions of teachers with emerging autonomy to active participants with both student agency and co-agency in particular with teacher agency, who also shape the classroom environments.

Table 2. The “new normal” in education¹

Features	Traditional education system	An education system embodying the “new normal”
Education system	Education system is an independent entity	Education system is part of a larger eco-system
Responsibility and stakeholders engagement	Decisions made based on a selected group of people and thus they become held accountable and responsible for the decisions made Division of labour (Principals manage schools, teachers teach, students listen to teachers and learn)	Decision-making and responsibilities shared among stakeholders , including parents, employers, communities, and students Shared responsibility (everyone works together and assumes responsibility for a student’s education and students also learn to be responsible for their own learning)
Approach to effectiveness and to quality of school experience	Outcomes most valued (student performance, student achievements are valued as indicators to evaluate systems for accountability and for system improvement) Focus on academic performance	Valuing not only “outcomes” but also “process” (in addition to student performance and student achievements, students’ learning experiences are in and of itself recognised as having intrinsic value) Focus on not only academic performance but also on holistic student well-being
Approach to curriculum design and learning progression	Linear and standardized progression (the curriculum is developed based on a standardised, linear learning-progression model)	Non-linear progression (recognising that each student has his/her own learning path and is equipped with different prior knowledge, skills and attitudes when he/she starts school)
Focus of monitoring	Valuing accountability and compliance	System accountability as well as system improvements (e.g. continuous improvement through frequent feedback at all levels)
Student assessment	Standardised testing	Different types of assessments used for different purposes
Role of students	Learning by listening to directions of teachers with emerging student autonomy	Active participant with both student agency and co-agency in particular with teacher agency

Note: For an animated version of this information visit www.youtube.com/watch?v=9YNDnkph_Ko.

From OECD Key Competencies to OECD Transformative Competencies

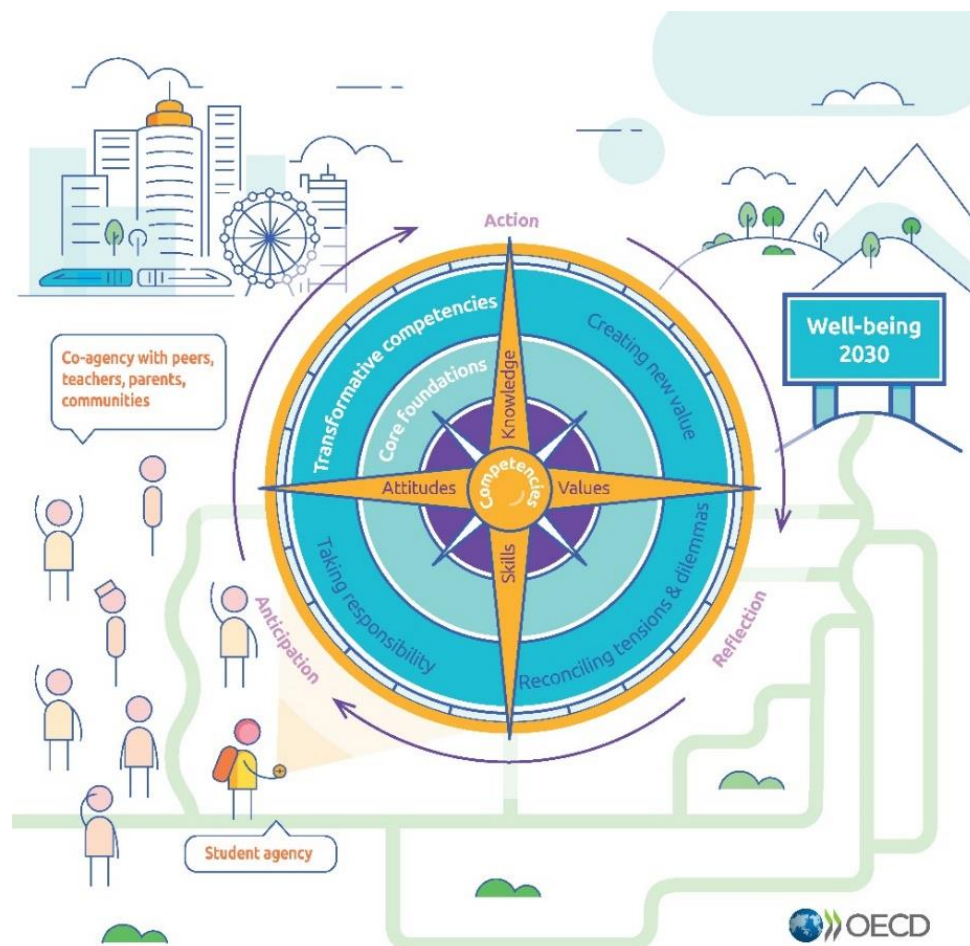
The Education and Skills 2030 project began by revising the OECD Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo) project. This latter project was developed by the OECD between 1997 and 2003 with an aim of providing theoretical and conceptual foundations for identifying the competencies needed for a successful life and a well-functioning society. The DeSeCo project identified three categories of competencies as OECD Key Competencies:

- **Use tools interactively (e.g. language, technology)**
 - The ability to use language, symbols and text interactively
 - The ability to use knowledge and information interactively
 - The ability to use technology interactively
- **Interact in heterogeneous groups**
 - The ability to relate well to others
 - The ability to co-operate
 - The ability to manage and resolve conflicts
- **Act autonomously**
 - The ability to act within the “big picture”
 - The ability to form and conduct life plans and personal projects
 - The ability to assert rights, interests, limits and needs.

Building on the DeSeCo framework, the OECD Learning Framework 2030 includes new insights and emerging concepts from thought leaders that may not be fully researched yet. It aims to increase its relevance to policy makers by linking the framework to curriculum design issues. The framework was constructed, and is understood by stakeholders, as actionable and multi-directional. It is both globally relevant and informed, and flexible enough for local contextualisation.

The framework was designed through iterative, continuous discussions among national and local governments, academic experts from different disciplines, schools, practitioners, social partners and students. Thematic working groups were established for each of the underlying key concepts that comprise the OECD Learning Framework 2030. The Learning Framework uses the metaphor of the “learning compass” to show the types of competencies students need in order to navigate towards the future we want, individually and collectively.

OECD Learning Compass 2030



Just as a compass orients a traveller, the OECD Learning Compass 2030 indicates the knowledge, skills, attitudes and values students need not just to weather the changes in our environment and in our daily lives, but to help shape the future we want.

The Learning Compass 2030 is composed of seven elements:

1. Core foundations

The OECD Learning Compass 2030 defines core foundations as the fundamental conditions and core skills, knowledge, and attitudes and values that are prerequisites for further learning across the entire curriculum. The core foundations provide a basis for developing student agency and transformative competencies. All students need this solid grounding in order to fulfil their potential to become responsible contributors to and healthy members of society.

2. Transformative competencies

To meet the challenges of the 21st century, students need to be empowered and feel that they can help shape a world where well-being and sustainability – for themselves, for others and for the planet – are achievable. The OECD Learning Compass 2030 identifies three “transformative competencies” that students need in order to contribute to and thrive in our world, and shape a better future: creating new value, reconciling tensions and dilemmas, and taking responsibility.

3. Student agency/ co-agency

Student agency is defined as the belief that students have the will and the ability to positively influence their own lives and the world around them as well as the capacity to set a goal, reflect and act responsibly to effect change. Student agency relates to the development of an identity and a sense of belonging. When students develop agency, they rely on motivation, hope, self-efficacy and a growth mindset (the understanding that abilities and intelligence can be developed) to navigate towards well-being. This enables them to act with a sense of purpose, which guides them to flourish and thrive in society. Students learn, grow and exercise their agency in social contexts and this is why co-agency is also crucial. Students develop co-agency in an interactive, mutually supportive and enriching relationship with their peers, teachers, parents and communities in an organic way in a larger learning eco-system.

4. Knowledge

As part of the OECD Learning Compass 2030, knowledge includes theoretical concepts and ideas in addition to practical understanding based on the experience of having performed certain tasks. The Education and Skills 2030 project recognises four different types of knowledge: disciplinary, interdisciplinary, epistemic and procedural.

5. Skills

Skills are the ability and capacity to carry out processes and be able to use one’s knowledge in a responsible way to achieve a goal. The OECD Learning Compass 2030 distinguishes three different types of skills: cognitive and metacognitive; social and emotional; and practical and physical.

6. Attitudes and values

Attitudes and values refer to the principles and beliefs that influence one's choices, judgements, behaviours and actions on the path towards individual, societal and environmental well-being. Strengthening and renewing trust in institutions and among communities require greater efforts to develop core shared values of citizenship in order to build more inclusive, fair, and sustainable economies and societies.

7. Anticipation-Action-Reflection cycle

The Anticipation-Action-Reflection (AAR) cycle is an iterative learning process whereby learners continuously improve their thinking and act intentionally and responsibly. In the anticipation phase, learners become informed by considering how actions taken today might have consequences for the future. In the action phase, learners have the will and capacity to take action towards well-being. In the reflection phase, learners improve their thinking, which leads to better actions towards individual, societal and environmental well-being.

OECD Future of Education and Skills 2030 Phase II

From 2019 onward, Phase II the OECD Future of Education and Skills 2030 project will shift its focus.

First, it will shift its focus of **concept-making** from “learning for 2030” to “teaching for 2030”. Phase II will explore the types of teacher competencies and teacher profiles that can help all students realise their potential. Teachers are key to implementing curricula effectively. While technology may become a superior vehicle for transmitting knowledge, the relational aspects of teaching – being a good coach, a good mentor – will remain human capacities of enduring value (Schleicher, 2018^[9]). Identifying the competencies held by the most effective and successful teachers can help countries enhance the quality of their teaching workforce.

Second, the **curriculum analysis** will shift its focus from “curriculum redesign” to “curriculum implementation”. Participating countries have agreed to focus on:

- curriculum change as part of a larger system of change management
- aligning curriculum changes with changes in pedagogies and assessments
- aligning curriculum changes with changes in initial teacher education and professional development (including school leaders).

These areas will be examined through an analysis of existing research, an international survey on curriculum implementation, multi-stakeholder consultations and global peer-learning.

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Notes

¹ The table is a simplified representation of complex phenomena in OECD countries; therefore some of the tables may not represent the general trends of the countries/ jurisdictions. For the information concerning the 21st century, the aim is not to summarise general trends but to set out an aspirational vision, a “new normal”. Certain trends may still be emerging at the time of writing.

² The term “new normal” emerged following the financial crisis of 2007-08 in reference to the altered global financial conditions. The term gradually gained ground in contexts other than business and economics, and is now widely used to indicate that something which was once abnormal has become commonplace.