



OECD Future of Education and Skills 2030

Conceptual learning framework



CORE FOUNDATIONS FOR 2030



IN BRIEF

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The OECD Learning Compass 2030 defines core foundations as the fundamental conditions and core skills, knowledge, 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. They are also the building blocks upon which context-specific competencies for 2030, such as financial literacy, global competency or media literacy, can be developed.

The international stakeholders of the OECD Future of Education and Skills 2030 project highlight three foundations as particularly important: cognitive foundations, which include literacy and numeracy; health foundations, including physical and mental health, and well-being; social and emotional foundations, including moral and ethics and digital literacy and data literacy.

While the OECD Learning Compass 2030 recognises the importance of moral and ethical foundations in decision making, self-regulation, and the conduct of self and society, it does not presume to articulate what moral or ethical norms are or should be, as these are contingent upon culture, history, place and society.

The core foundations provide a basis for developing student agency and transformative competencies

KEY POINTS

- What it means to be literate and numerate in 2030 and beyond will continue to evolve. Given the expansion of digitalisation and big data into all areas of life already, all children need to be digital and data literate.
- With health as a core foundation, people can understand and act on the knowledge that will keep them well and healthy over their lifetime.
- To avoid curriculum overload, newer competencies, such as financial literacy or global competence, could be embedded within the existing curriculum in a meaningful way, so that all students benefit from both deeper learning experiences and quality learning in the core foundations.



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Prof. Uwe Puhse, Head, Department of Sport, Exercise and Health, University of Basel, Switzerland
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Core Foundations for 2030

The OECD Learning Compass 2030 defines core foundations as the fundamental conditions and core skills, knowledge, 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 to fulfil their potential to become responsible contributors to and healthy members of society.

The international stakeholders of the OECD Future of Education and Skills 2030 project highlight three foundations as particularly important:

- cognitive foundations, which include literacy and numeracy, upon which digital literacy and data literacy can be built
- health foundations, including physical and mental health, and well-being
- social and emotional foundations, including moral and ethics

These core foundations are the building blocks upon which context-specific competencies for 2030, such as financial literacy, global competency or media literacy, can be developed. They also form the basis of transformative competencies, which can be transferred across a wide range of contexts (see [concept note on Transformative Competencies](#)).

Literacy and numeracy remain fundamental

The definition of literacy is complex, and changes with culture and context (Ntiri, 2009^[1]). At its root, literacy is the ability to read, write, speak and listen in a way that lets people communicate effectively and make sense of the world. More specifically, it can be understood to be the ability to comprehend, interpret, use and create textual and visual information in various formats, contexts and for diverse purposes (making meaning based on encoding and decoding signs/sign systems). Literacy therefore underpins human communication, particularly through oral and written language systems.

The concept of numeracy is also subject to interpretation, based on context. Numeracy is “the ability to access, use, interpret and communicate mathematical information and ideas to engage in and manage mathematical demands of a range of situations” (PIAAC Numeracy Expert Group, 2009^[2]). Specifically, numeracy can be understood as the ability to use mathematical tools, reasoning and modelling in everyday life, including in digital environments. In the latter, people draw on combinations of numeracy, data literacy and digital literacy skills. The fundamental importance of developing learners’ literacy and numeracy is underpinned by decades of education research – and common wisdom. To function effectively in modern society, people need to be able to read and write, make meaning out of the many signs – numerical and linguistic – that populate our daily lives, and communicate meaningfully through a variety of media. Literacy and numeracy will be as essential in 2030 (and beyond) as they are today.

But some cognitive core foundations need to be updated

What it means to be literate and numerate in 2030 and beyond will continue to evolve.

Already, personalised health and fitness apps on mobile phones collect real-time data from location services and physical movement; finance and budgeting apps gather data from banking transactions or online accounts. Interactive graphs and charts presented on social media or online news sources, video journals (or “vlogs”), and “smart” home appliances that are networked with personal communication devices have irrevocably changed the nature and density of people’s interactions with the digital world.

Given this expansion of digitalisation into all areas of life, digital and data literacy are already considered to be core foundations. Being literate in this context requires the ability to read, interpret, make meaning of and communicate through digital texts and sources from a variety of online media. It also requires the ability to evaluate critically and filter information that is so easily produced, accessed and made public.

Being numerate requires not just being able to work through mathematical formula in an exercise book, but being proficient in navigating, interpreting and computing diverse data in daily life and professional contexts, and to communicate with data. As the means of communicating information become more diverse, students need to be able to locate, evaluate and interpret a range of digital and printed material (Rouet and Britt, 2012_[3]). **Digital literacy** relies on the same fundamental abilities as “traditional” literacy; but digital literacy is applied in digital contexts and draws on new digital tools and competencies.

With the explosion of data and the advent of “big data”, all children will need to be data literate. **Data literacy** is the ability to derive meaningful information from data, the ability to read, work with, analyse and argue with data, and understand “what data mean, including how to read charts appropriately, draw correct conclusions from data, and recognise when data are being used in misleading or inappropriate ways” (Carlson et al., 2011_[4]).

Data literacy focuses on both the technical and social aspects of data. It encompasses activities related to data management, including data curation, data citation and fostering data quality. When data are processed, interpreted, organised, structured or presented so as to make them meaningful or useful, they are called information. Information in any format is produced to convey a message; it is shared through communication.

In 2012, people generated more data than all of mankind had from the beginning of recorded history to 2010 (Weigend, 2012_[5]). Every minute, YouTube users upload over 48 hours of new video. In 2018, nearly 500 million tweets were posted every day (Omnicores, 2019_[6]); roughly 30 billion pieces of content are shared on Facebook every month (Bhatia, 2019_[7]). Data is being produced at an unprecedented rate and this growth is not only in size but also in number of sources.

Since businesses today need to deal with large amounts of data, the business model of “platforms” is increasingly being used. Platforms are an “efficient way to monopolise, extract, analyse and use the increasingly large amounts of data that [are] being recorded” and have been used in a variety of businesses, such as Google, Uber, Siemens and Monsanto (Srnicek, 2017_[8]).

The explosive growth and influence of big-data industries create vast new opportunities, pressures and ethical challenges and dilemmas. Becoming data literate is essential. Living in a digitalised world requires reconciling tensions, such as the paradox of an increasingly interconnected world, on the one hand, and the rise of social isolation on the other, or the emergence of a “post-truth” culture in an era of a nearly limitless number and scope of media sources.

Health is also a core foundation

Students need to develop good physical and emotional well-being if they are to learn effectively. With health as core foundation, people can understand and act on the knowledge that will keep them well and healthy over their lifetime. This entails people's capacities, skills, knowledge, motivation and confidence to access, understand, appraise and apply health information so that they can form valid judgements and make responsible decisions concerning healthcare, disease prevention and health promotion to improve their quality of life ((HLS-EU) Consortium Health Literacy Project European, 2012_[9]; Zarcadoolas, Pleasant and Greer, 2005_[10]; Kickbusch and Maag, 2008_[11]).

Acute or chronic disruptions to student health not only interrupt students' social and emotional well-being, but can impede their opportunities to learn and progress at school (Aston, 2018_[12]; WHO, 2017_[13]; WHO, 2017_[14]). If students are to develop the cognitive skills of literacy, numeracy, digital literacy and data literacy through sustained learning, they also need to be in good overall health and be able to adapt to evolving health issues. While it is important to have health-literate students, that is, students who have the knowledge, skills, attitudes and values to lead physically active and healthy lives, students should also be able to sustain healthy behaviours. That is why "health", rather than health literacy, is included as a core foundation in the OECD Learning Compass 2030.

Research shows that physical and mental health habits in youth are carried into adult life, and that there is a link between physical activity, which is central to our overall health, and academic achievement (Cook and Kohl, 2013_[15]). Results from the OECD Programme for International Student Assessment (PISA) reveal a positive correlation between the average science performance of an education system and the number of days 15-year-old students in that country engage in moderate physical activity outside of school (OECD, 2017_[16]). As the OECD's 21st-Century Children project finds, "children who exercise regularly, have good nutrition and sleep well are more likely to attend school, and do well at school" (Burns, 2018_[17]). There is also growing evidence that good health habits in youth are associated with the quality of life and social engagement throughout a lifetime (Halfon, Verhoef and Kuo, 2012_[18]; Dietz, 1998_[19]).

But today's children and adolescents report higher levels of stress and less sleep than previous generations (Aston, 2018_[12]). New technologies pose new risks, such as cyberbullying, potentially harmful online behaviours, and less time spent in physical activities (Hooft Graafland, 2018_[20]). However, some studies also suggest that moderate Internet use can lead to positive outcomes, such as greater rapport with peers (Gottschalk, 2019_[21]). More research is needed to understand the impact of technology use on children's health, and how this impact may change, depending on when and why technology is used (Gottschalk, 2019_[21]). In the meantime, it is crucial to encourage students to develop good sleep behaviours and engage in activities associated with healthy development, such as spending quality time with family and peers (Burns and Gottschalk, 2019_[22]).

The capacity to adapt, learn new skills and work with others is built on social and emotional foundations

Social and emotional foundations, which include emotional regulation, collaboration, open-mindedness and engaging with others – affect how well individuals adapt to and engage with their environments, including at home, at school and at work. A growing body of evidence demonstrates the impact of our social and emotional skills on a range of life outcomes, including education, jobs, relationships and even our health (Kankaraš, 2017_[23];

OECD, 2015^[24]; Kautz et al., 2014^[25]). For example, early development of social and emotional skills, such as self-awareness and self-regulation, have a medium to strong long-term predictive power of positive outcomes for children later in their lives (Schoon et al., 2015^[26]).

Social and emotional foundations thus help children and young people meet the challenges of the future. Young people need to be able to adapt constantly, learn new skills, meet and overcome challenges, and work collaboratively to address the big issues confronting our individual and collective lives. The capacity to do so draws on social and emotional skills, such as resilience, self-regulation, trust, empathy and collaboration.

At school, students experience education as a social process: learning is facilitated (or hindered) by their relationships and interactions with other people, including their peers, teachers, parents and the wider community (Zins et al., 2007^[27]). A student who has developed social and emotional foundations will be better placed to navigate the challenges and processes of learning in and outside of school.

Social and emotional foundations are linked to **moral and ethical** foundations, which are defined as “the capacity to make decisions and judgements that are moral (i.e. based on internal principles) and to act in accordance with such judgements” (Kohlberg, 1984^[28]). Such foundations are fundamentally important for solving dilemmas and conflicts through thinking and discussion on the basis of (shared) principles rather than through violence, deceit and abuse of power (Lind, 2015^[29]).

In order for children and young people to navigate through a range of social and emotional situations, to make good personal decisions and avoid risky behaviours, and to protect their own and others’ health and well-being, they will need to develop and internalise moral and pro-social principles and self-regulatory skills and behaviours, such as empathy, acting with honesty, and treating others fairly (Gestsdottir and Lerner, 2008^[30]). It is thus insufficient for students to develop core knowledge and skills; they also need to develop core moral/ethical reasoning – when “I can...” statements are complemented by “Should I...?” moral self-questioning.

These moral and ethical capacities are vital for children and young people to develop so that they can apply the transformative competencies, such as reconciling tensions and dilemmas, and taking responsibility to promote the health, and social and emotional well-being of themselves and others.

While the OECD Learning Compass 2030 recognises the importance of moral and ethical foundations in decision making, self-regulation, and the conduct of self and society, it does not presume to articulate what moral or ethical norms are or should be, as these are contingent upon culture, history, place and society.

School systems around the world are grappling with the challenge of keeping up with social, technological and economic change

Is calculus – which has long been the pinnacle of mathematics curricula – really the most useful goal for mathematics students? Are schools preparing children to address the big issues and global shifts, such as climate change, increasing urbanisation and an ageing population? Which emerging areas of knowledge should schools be including in their curricula to ensure that young learners have many viable choices for post-secondary education and the future job market?

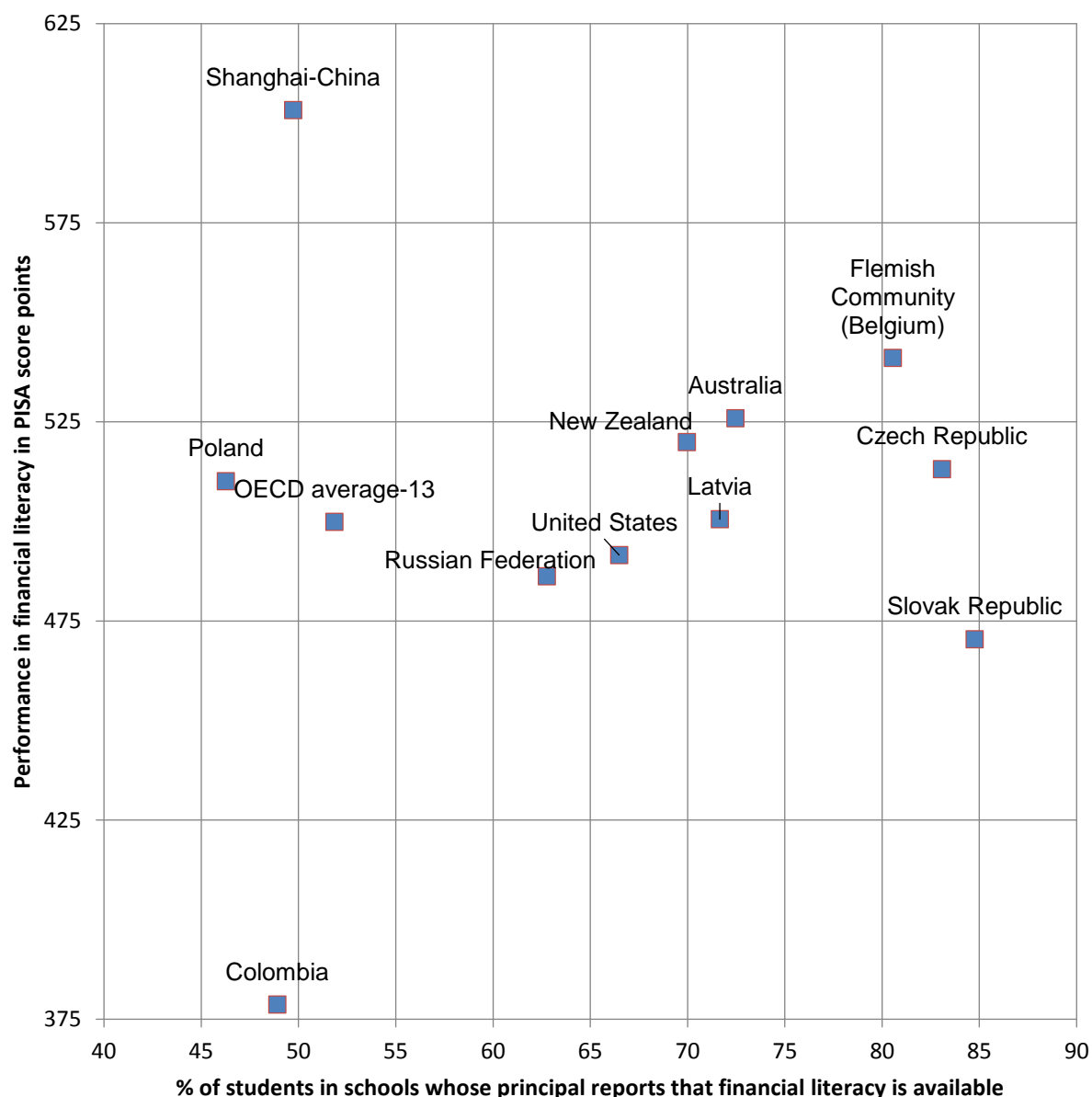
In light of global trends (see the [OECD Future of Education and Skills 2030 project background](#)), schools and school systems are under mounting pressure to modernise their curricula so that students can develop a broader set of knowledge, skills, values and attitudes to help them cope with new realities and new demands. For example, following the global financial crisis in 2008, some sectors of society called for schools to develop students' financial literacy. Similarly, with a growing wave of “fake news” and digital technologies transforming traditional news media, there are growing demands for schools to develop students' media literacy – the ability to derive meaning from and assess the credibility of multiple media sources through critical thinking. With the explosion of “start-up” culture, and the corresponding disruption to traditional workforce models and professional pathways, there are growing calls for students to develop their entrepreneurial skills. And in a world increasingly scarred by terror attacks and threats to civilian life and peace, the need for students to develop global competencies, including empathy, tolerance and respect for others, is urgent. Indeed, promoting peace and sustainable development through education is now enshrined in the United Nations Sustainable Development Goal (SDG) Target 4.7.

All of these “new” competencies draw on the core foundations, although they are applied in different situations and contexts.

But curricula are already overloaded

The curricula taught in schools are traditionally designed around specific disciplines and/or learning areas. Adding new subjects or learning areas can lead to curriculum overload, while embedding them within existing subjects can prove challenging, given the conceptual complexity of some of these competencies. Some evidence suggests that learning context-specific subjects in isolation may not be effective. For example, PISA results (OECD, 2014_[31]) reveal that there is no correlation between exposure to financial literacy programmes at school and scores on the PISA financial literacy test (Figure 1, see next page).

Figure 1. Exposure to financial literacy education at school and performance in financial literacy



Source: OECD, PISA 2012 Database, Table VI.1.1. and Table VI.2.2.

This suggests that one answer may be to embed these newer competencies within the curriculum in a meaningful way that will lead to deep learning experiences for all students, in addition to quality learning in the core foundations. For example, on average across countries that participated in the OECD Future of Education and Skills 2030 Curriculum Content Mapping exercise,¹ financial literacy is usually embedded in such subjects as mathematics, humanities and technologies/home economics. Table 1 (next page) shows how a subject like financial literacy can be “decomposed” into its knowledge, skills, values and attitudes components.

Table 1. Deconstructing financial literacy into knowledge, skills, values and attitudes

	Knowledge		Skills	Attitudes and values
	Disciplinary (“financial literacy” subject)*	Inter-disciplinary/cross curricular (including for example mathematics, social sciences, economics, business, citizenship)*	Cognitive skills	
Money and transactions	Understanding that money can be exchanged for goods or services Being aware that money spent on something is no longer available to be spent on something else	Understanding that money held as cash or in the bank loses value in real terms if there is inflation Being aware of the common forms of money, payment methods and income sources	Being able to recognise and count money (in own and foreign currency) Being able to compare different ways of transferring money, making payments and receiving money Being able to use arithmetic to make choices based on price and quantity, check change and evaluate discounts Being able to read and check financial documents, such as bank statements	Being confident to talk about money matters with family and other trusted adults Being confident to handle money and simple transactions Being confident to make one’s own spending decisions even if peers make different choices Understanding that spending choices can have an ethical component and can impact on others
Planning and managing finances	Knowing the difference between needs and wants Understanding the benefits of planning finances and keeping track of expenses	Understanding the implications of saving and borrowing, and how they are affected by compound interest	(Appreciating the importance of) living within one’s means and paying debt on time Being able to plan ahead for expenses expected to occur in the near future Being able to make informed decisions (possibly with parents) about saving and investment in further education	Being confident to manage personal spending, saving and credit Being motivated to save for a particular item or future event Being prepared to delay gratification in order to gain more in the future
Risk and reward	Understanding that financial products can come with both risks and rewards, and that usually greater rewards are associated with higher risks Understanding the importance of creating financial safety nets	Having basic awareness of how savings and insurance products can help manage risk	Being able to assess the relative risks and rewards of simple financial products, choices or business ventures Being able to make informed decisions about the need for insurance when buying products or services	Being cautious about making financial decisions hastily, or without having access to good-quality information or advice about the risk and rewards. Being confident to take some calculated financial risks
Financial landscape		Being aware of financial regulation Understanding the difference between impartial financial information, and marketing or advertising Having a general understanding of how tax and benefits can affect one’s own spending and saving decisions Understanding how a person’s financial decisions can have consequences for others	Being able to identify and compare information before buying a financial product or service Taking care to keep personal data, passwords and money safe Being able to assess whether financial communication is genuine or potentially fraudulent Being able to make complaints when necessary	Being confident and motivated to apply rights and responsibilities as a consumer

* The distinction between disciplinary and interdisciplinary competencies is not intended in a strict sense, as all of these could be integrated into existing school subjects or could, in principle, be part of a separate “financial literacy” subject.

Source: Monticone (2016^[32]).

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Note

¹ The Curriculum Content Mapping exercise aims to identify the extent to which competencies that meet emerging demands (such as global competencies, digital literacy, collaboration, critical thinking, creativity and empathy) are present in countries’ existing curricula. Doing so will allow policy makers to identify the learning area (including mathematics, natural sciences the arts) in which a given competency (such as creativity) appears most prominently in written curricula. The results will provide important benchmarking and comparative data, which can help future curriculum development.

