How do countries compare?

Countries/jurisdictions experience curriculum overload in a variety of ways depending on their national contexts and circumstances. This section focuses on comparing different country/jurisdiction approaches to accommodate emerging societal needs into the curriculum[1]. It first presents an overview of which cross-curricular themes and competencies are articulated in curricula as well as how countries/jurisdictions make different choices on embedding them in existing learning areas so as to avoid further expanding of the already overcrowded curricula. The section then delves into different country/jurisdiction approaches to structure subject-specific goals in curricula and their potential impact on the content overload as perceived by teachers.

WHAT KINDS OF CROSS-CURRICULAR THEMES DO COUNTRIES/JURISDICTIONS ARTICULATE TO ACCOMMODATE NEW DEMANDS?

Figure 11 provides an overview of the most frequently selected cross-curricular themes across countries/jurisdictions participating in this study.

These themes also reflect the efforts of countries/jurisdictions to refresh their vision of education, echoing the Education 2030 Learning Compass. Some of the most frequent themes, including "**environmental education, sustainability**" and "**local and global citizenship, peace**", reflect efforts to accommodate 21st century challenges in curricula through cross-curricular themes. Cross-curricular themes are also used to promote holistic development of students beyond traditional learning. This is articulated through cross-curricular themes like "**health education, well-being, lifestyle**" or through value-based themes like "**moral/values education**" or "**cultural identity and multiculturalism**".

The granularity of themes included in curricula also varies across countries/jurisdictions. Most countries/jurisdictions include broad themes, such as "**ICT and media**" in Denmark and "**environmental education**" in the Czech Republic. Others complement these with more specific themes, such as "**road/safety education**" in Mexico and "**consumer education**" in Brazil.

There are also differences across countries/jurisdictions in the number of cross-curricular themes that are articulated. British Columbia (Canada), for example, highlights just one cross-curricular theme, that of "Indigenous knowledge and perspectives". Australia articulates three layers of national priorities: "**Aboriginal and Torres Strait Islander histories and cultures**"; "**Asia and Australia's engagement with Asia**"; and"**sustainability**".

Social, cultural and historical contexts are articulated using country-specific themes like: "**Indigenous knowledge and perspectives**" in British Columbia (Canada), "**Cultural identity**" in Estonia, "**Unification education**" in Korea and "**Education on ethnic-racial relations and history and culture of Afro-Brasileira, African and Indigenous peoples**" in Brazil (Table WEB 12[2]).

HOW DO COUNTRIES/JURISDICTIONS EMBED SUCH CROSS-CURRICULAR THEMES INTO EXISTING SUBJECTS?

Countries/jurisdictions vary not only in the type and number of cross-curricular themes that they articulate, but also in how these themes are embedded into existing subjects. The following sections describe how the cross-curricular themes of "**environmental literacy/literacy for sustainable development**", "**physical/health literacy**", "**ICT/digital literacy**", "**computational thinking/ programming/coding**", "**career education/work studies**", and "**media studies**" are embedded into curricula across countries and jurisdictions.

Environmental literacy/literacy for sustainable development

Environmental and sustainability education is found to be one of the most articulated cross-curricular themes as part of the general goals of education (Figure 11). Increasing concerns about climate change and local impacts might also explain why certain countries/jurisdictions have introduced new subjects specifically devoted to sustainable education, as in New Zealand.

Figure 11 **Types of cross-curricular themes reported by countries/jurisdictions**
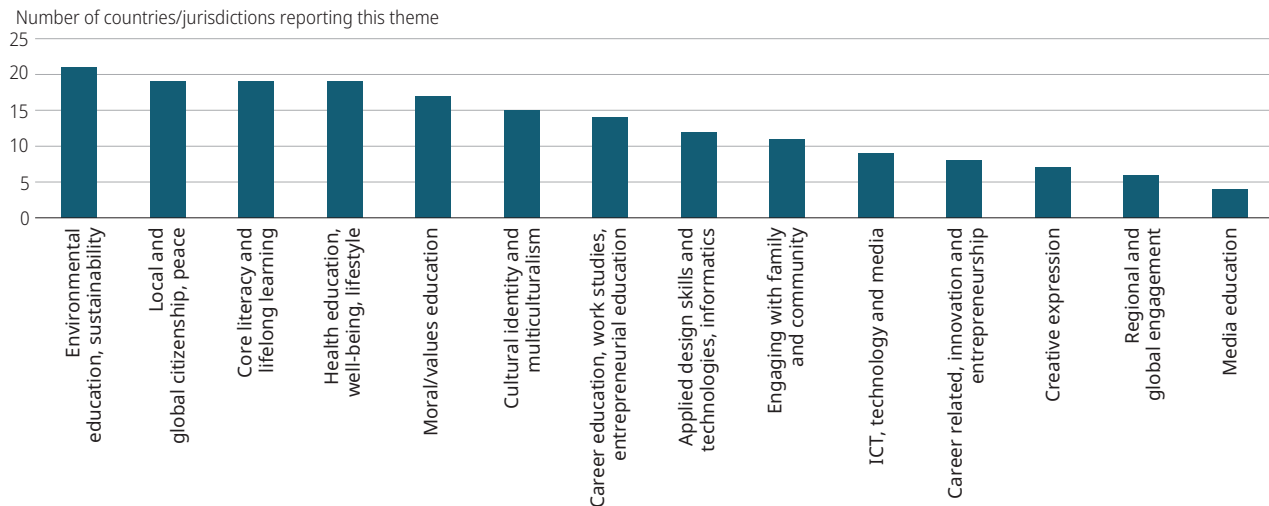
Note: Values displayed include only countries/jurisdictions with responses that could be clearly coded as yes/no. Ordered in descending order of number of countries reporting this theme.
Source: Data from the PQC, item 1.1.2.4.
StatLink https://doi.org/10.1787/888934195815

This focus on sustainable development is echoed in content items within traditional subjects; it is consistently mapped at moderate levels across curricula (Figure 12). Most countries/jurisdictions embed it in more than 20% of the curriculum. China embeds sustainable development in roughly 45% of the mapped curriculum, while Estonia and Japan embed it in nearly 40% of their curriculum.

Sustainable development literacy is found mostly in the areas of humanities, sciences, and technologies/home economics. Israel and Portugal only include sustainable development within the areas of humanities and sciences. Notably, China embeds sustainable development literacy across six out of the seven mapped learning areas.

Physical and health literacy

Nineteen (out of 37 countries) countries/jurisdictions embed health literacy as a cross-curricular theme into existing subjects (Figure 11). In doing so, nearly all countries/jurisdictions, unsurprisingly, predominantly embedded physical/health literacy in the subject of **physical education/health** (e.g. in British Columbia [Canada] and Japan). In Portugal and the Russian Federation, **science** is the subject that carries most of the items related to physical/health literacy. In some countries/jurisdictions including Estonia, Northern Ireland (United Kingdom) and Kazakhstan, physical/health literacy is widely distributed across subjects. (Figure 13)

Hungary and Ireland created a new subject to foster students' ability to maintain and develop their well-being as well as to adopt **a healthy lifestyle**. These subjects might be seen as a potential tool to counterbalance new threats to the health and well-being of the young population, such as increasing stress related to academic performance and risks associated with the widespread use of technologies in social interactions. In other countries, **health education** is not a separate subject but is mainly combined in the curriculum with **physical education**, as in Australia, Chile, Japan, Ontario (Canada), Wales (United Kingdom) and China (OECD, 2019[1]).

Figure 12 **Literacy for sustainable development in curricula**

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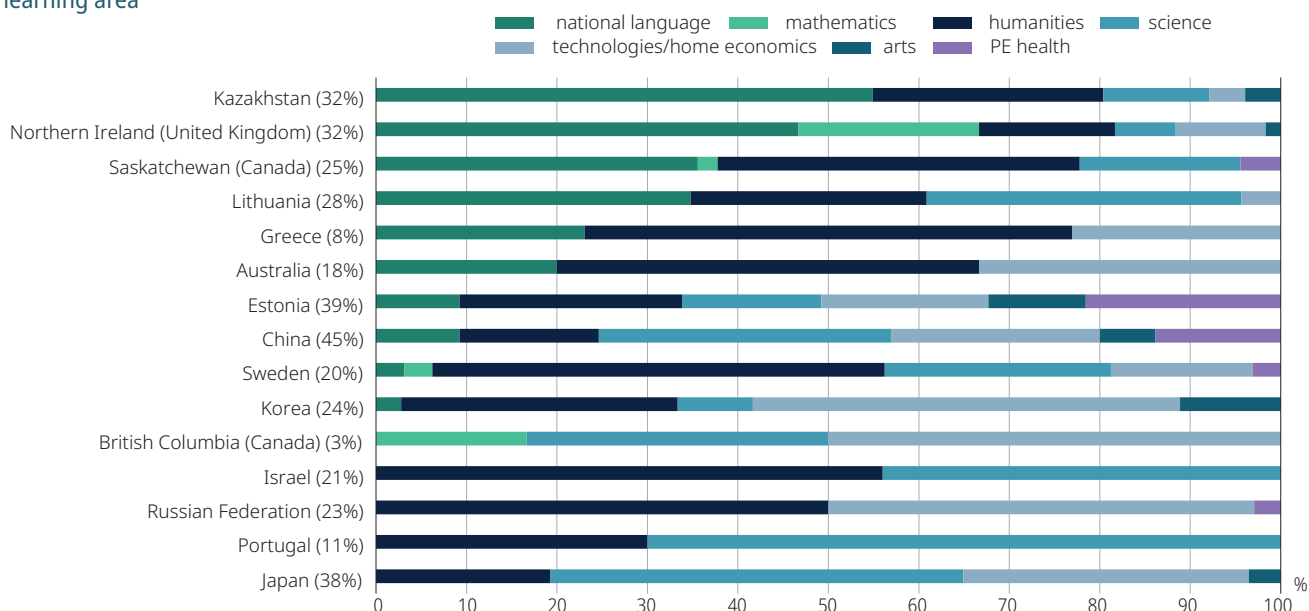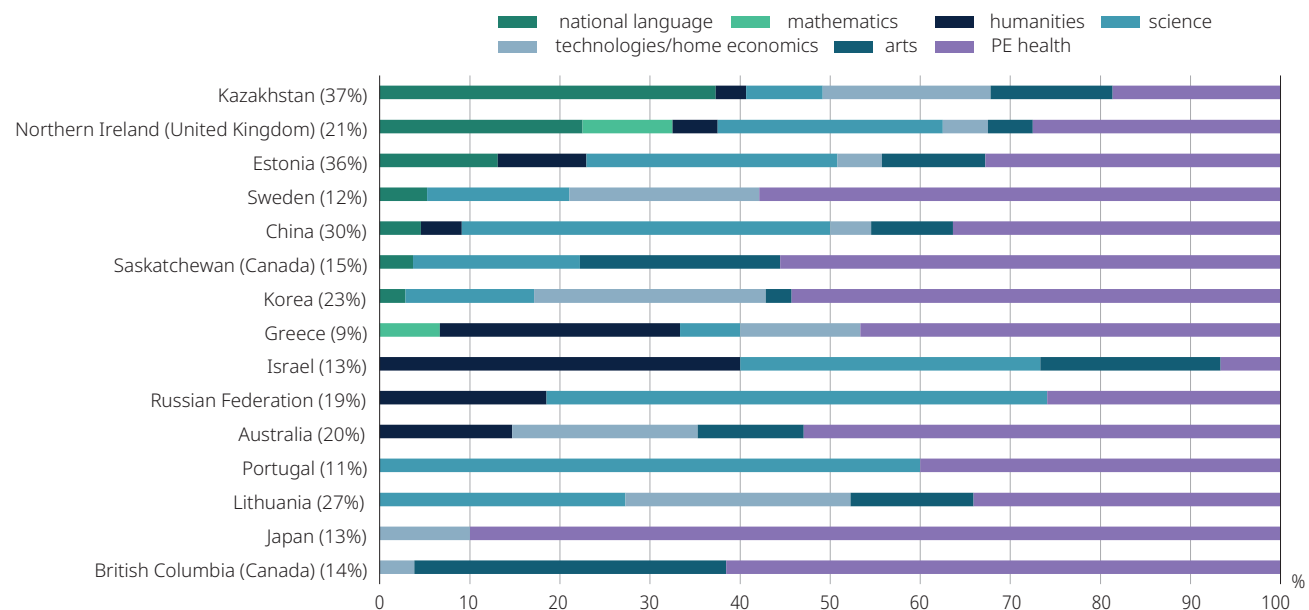

Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.

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

StatLink https://doi.org/10.1787/888934195834

Figure 13 **Physical/health literacy in curricula**

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

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

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

StatLink https://doi.org/10.1787/888934195853

## ICT/digital literacy and technologies, informatics

Nine (out of 37) countries/jurisdictions include it as a cross-curricular theme (Figure 11), and some reflect it in subject-specific content items. ICT/digital literacy is strongly emphasised within the content of mapped curricula. In most countries/jurisdictions, over 30% of the curriculum embeds this competency (Figure 14). Estonia stands out because of the stronger emphasis given to ICT/digital literacy in its curriculum (almost 70% of the mapped curriculum items embed it). In Estonia, science and humanities are the two most highlighted learning areas for the development of ICT/digital literacy. In these areas, ICT literacy is not highlighted as a subject-specific education goal. Yet, it is still embedded in around 20% of the items in each. To reinforce ICT literacy, Estonia adopts a three-sided approach, including it as a cross-curricular competence, a cross-curricular theme and a stand-alone subject.

Korea and Kazakhstan also strongly highlight ICT/digital literacy in their mapped curricula (just below 60% of the items include it). In Kazakhstan, mathematics is particularly highlighted as a space to develop ICT/digital literacy (with just above 30% of the items).

A noticeable pattern across participating countries/jurisdictions is, that ICT/digital literacy is consistently embedded in most of the seven mapped learning areas. In general, countries/jurisdictions take many opportunities to foster ICT competency in their curricula. It is frequently embedded in the domains of both science, technology, engineering and mathematics (STEM) and social sciences (such as humanities and national language). The presence of this competency is less prevalent in some of the mapped areas, notably in physical education/health and arts (with a lower percentage of items incorporating it across countries/jurisdictions).

Figure 14 **ICT/digital literacy in curricula**

Distribution of content items in the mapped curricula targeting ICT/digital literacy (as main or sub target), by learning area
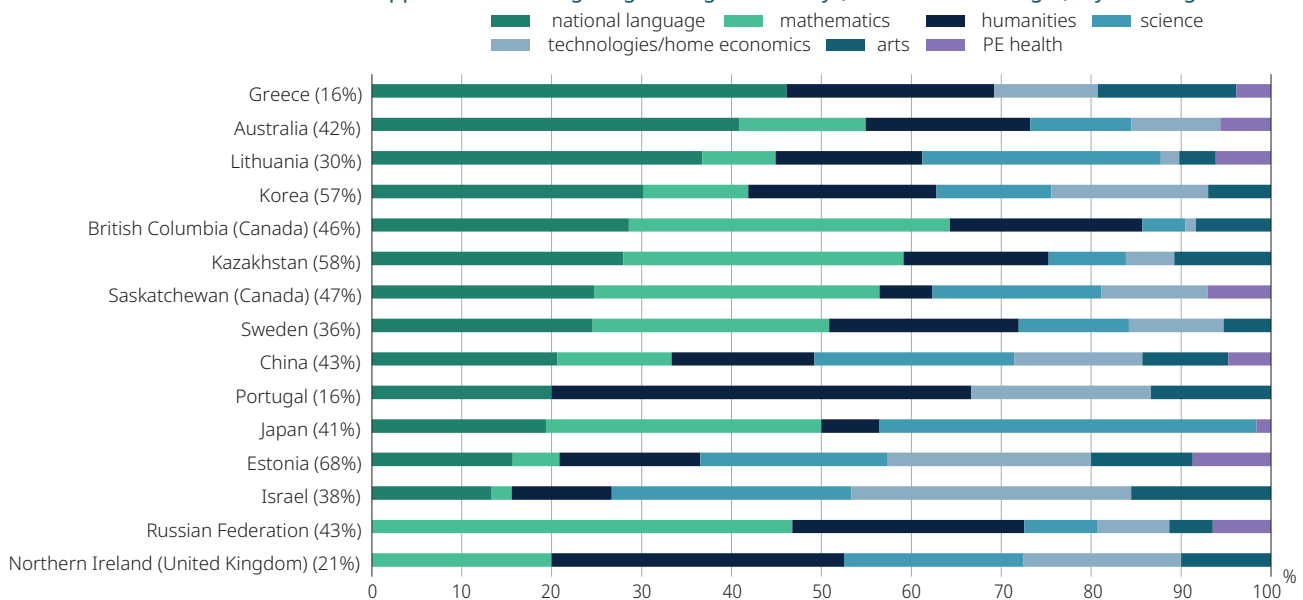
Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that includes the competency. Ordered by decreasing percentage of items mapped in national language.
Source: Data from the Education 2030 Curriculum Content Mapping exercise.
StatLink ᵃᵐˢᴸ https://doi.org/10.1787/888934195872

Computational thinking/programming/coding

With the increasing presence and use of big data, students need not only to be literate in data and technologies but also to be creators, programmers and users of data, consistent with the co-agency model of knowledge creation put forth by the OECD Learning Compass 2030. The European Commission suggests that the demand for workers with specialist digital skills, such as computational thinking, programming and coding is growing by about 4% each year (Berger and Frey, 2015[2]).

Computational thinking/programming/coding is closely linked to ICT/digital literacy. This may explain why only Poland explicitly embeds programming as a cross-curricular competency and theme. In other countries, coding or competency is usually accounted for under broader competencies or themes such as ICT or IT skills.

Figure 15 **Computational thinking/programming/coding in curricula**

Distribution of content items in the mapped curricula targeting literacy for computational thinking/programming/coding (as main or sub target), by learning area
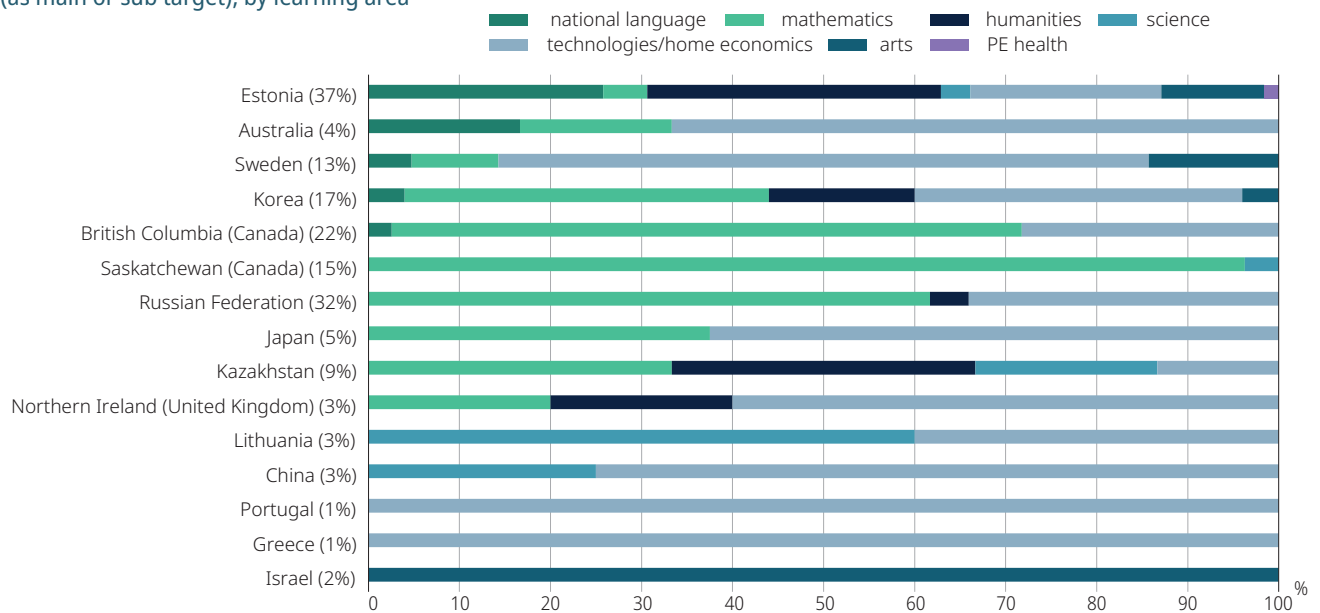
■ national language ■ mathematics ■ humanities ■ science
■ technologies/home economics ■ arts ■ PE health

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

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

StatLink 🖳 https://doi.org/10.1787/888934195891

Coding and computational thinking are not explicitly highlighted as a cross-curricular topic or as a stand-alone subject. While higher than entrepreneurship, computational thinking/programming/coding does not have a large degree of integration into the mapped curriculum (Figure 15).

The majority of countries/jurisdictions have low levels (below 10%) of computational thinking/programming/coding embedded in their curriculum, but the proportion is much higher in Estonia (37%) and the Russian Federation (32%). Estonia has a triple approach for embedding ICT in its curricula, including it as a cross-curricular theme, a competency and a stand-alone subject. This reinforced approach ensures that ICT skills do not get "lost" among other curricular priorities. As a result, even if coding/computational thinking is not explicitly considered a competency or theme, it appears quite frequently across content items in all subjects of the mapped curricula.

Computational thinking/programming/coding is almost exclusively covered in the technology/home economics and mathematics learning areas. However, Israel only includes it in arts, but to a very limited extent.

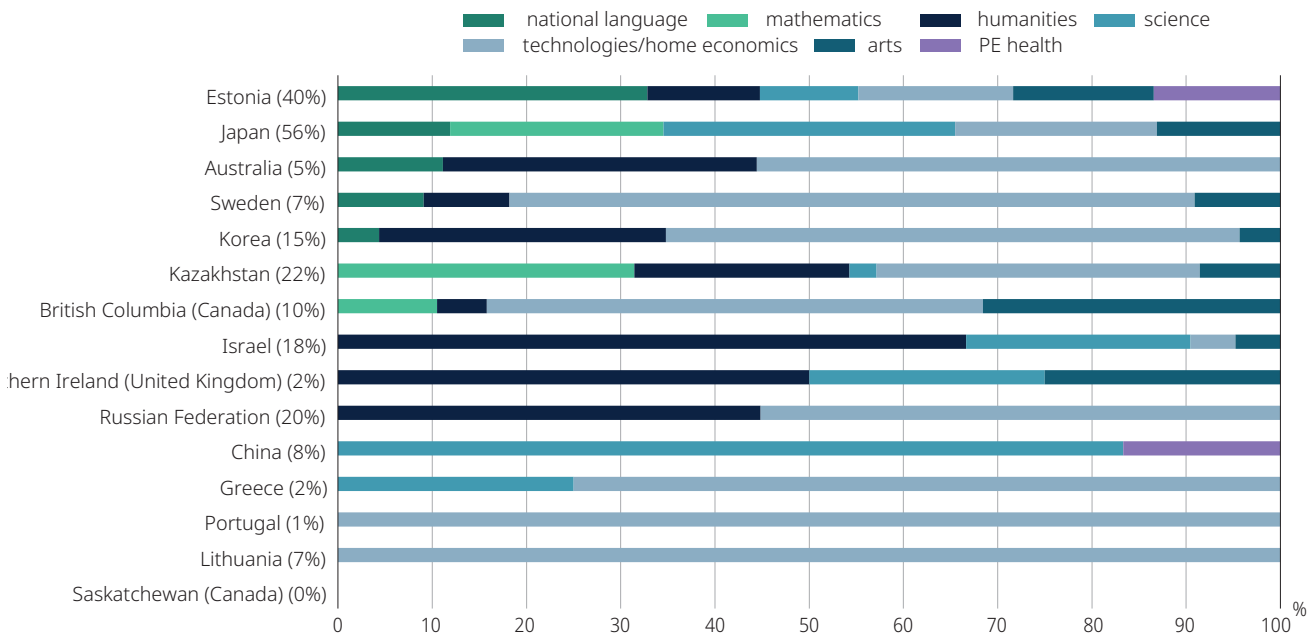## Career education, work studies, entrepreneurial education

Relative to other cross-curricular topics, entrepreneurship is only modestly embedded within traditional subjects in a large set of countries/jurisdictions. Half of those participating in the CCM include this cross-curricular topic in less than 10% of the content items in their mapped curricula. This includes Greece, Lithuania, Northern Ireland (United Kingdom), Portugal, Saskatchewan (Canada), Sweden and China (Figure 16).

Other countries have put emphasis on entrepreneurship and embed it in a much higher proportion of the content items in their mapped curricula, as in Estonia (40%) and Japan (56%). This cross-curricular focus on entrepreneurship is articulated with a holistic approach. Both countries embed entrepreneurship across most learning areas in their curricula, including national language, humanities, science, technologies/home economics and arts. In Estonia, this approach is combined with a specific subject for entrepreneurship, which also exists in other countries, such as Korea.

In nearly all countries/jurisdictions, entrepreneurship is embedded within technologies/home economics. A substantial number also use humanities as a platform to embed entrepreneurship. Yet, countries/jurisdictions do not appear to take every opportunity within curricula to tackle entrepreneurship. Learning areas such as mathematics or science are rarely used to embed entrepreneurship.

Figure 16 **Entrepreneurship in curricula**

- -

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

Legend: national language, mathematics, humanities, science, technologies/home economics, arts, PE health

Estonia (40%)
Japan (56%)
Australia (5%)
Sweden (7%)
Korea (15%)
Kazakhstan (22%)
British Columbia (Canada) (10%)
Israel (18%)
...hern Ireland (United Kingdom) (2%)
Russian Federation (20%)
China (8%)
Greece (2%)
Portugal (1%)
Lithuania (7%)
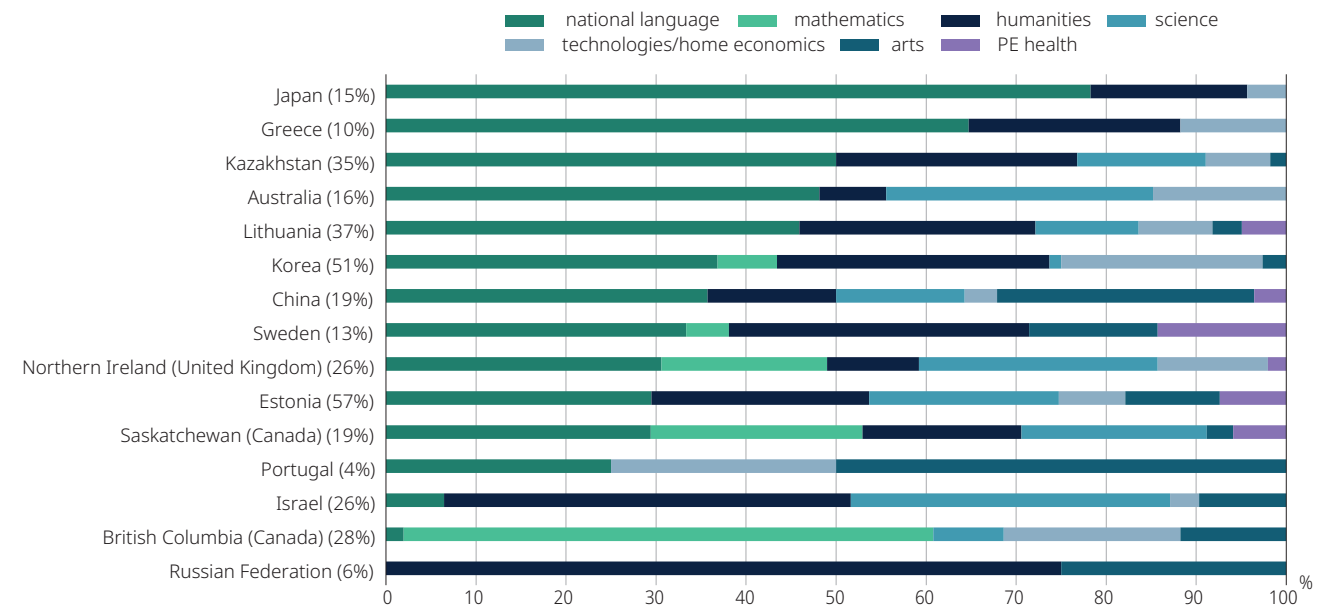Saskatchewan (Canada) (0%)

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

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

StatLink 🔗 https://doi.org/10.1787/888934195910

Figure 17 **Media literacy in curricula**

- -

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

Legend: national language, mathematics, humanities, science, technologies/home economics, arts, PE health

Japan (15%)
Greece (10%)
Kazakhstan (35%)
Australia (16%)
Lithuania (37%)
Korea (51%)
China (19%)
Sweden (13%)
Northern Ireland (United Kingdom) (26%)
Estonia (57%)
Saskatchewan (Canada) (19%)
Portugal (4%)
Israel (26%)
British Columbia (Canada) (28%)
Russian Federation (6%)

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

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

StatLink 🔗 https://doi.org/10.1787/888934195929

Media education

There is a growing need to manage the wave of fake news and digital technologies transforming traditional news media. There are growing demands for schools to develop students' media literacy. The competency of media literacy is defined as the ability to derive meaning from and assess the credibility of multiple media sources through critical thinking (OECD, 2019[3]).

In the countries/jurisdictions that participated in the PQC, media education is not frequently explicitly embedded in curricula, as either a cross-curricular topic or stand-alone subjects. The Czech Republic, Denmark, Quebec (Canada) and Northern Ireland (United Kingdom) embed it as a cross-curricular theme. Northern Ireland (United Kingdom) has introduced media education as a stand-alone subject and in Australia, 'Media Arts' is one of five subjects in the Curriculum for The Arts.

However, media education is usually addressed in traditional subjects in the countries/jurisdictions participating in the CCM. In most other countries/jurisdictions, media literacy is present in about 20% to 30% of their mapped curriculum. Two countries, Korea and Estonia, embed it in more than 50% of the mapped curriculum.

Media literacy is mostly embedded in two or three learning areas, such as national language, humanities or technology/home economics (Figure 17). Notable exceptions are two Canadian jurisdictions (British Columbia and Saskatchewan), which include media literacy in mathematics, and the Russian Federation, which includes media literacy only in humanities and arts.

Media education has been introduced as one of the five subjects of the Curriculum for the Arts in Australia, where 16% the mapped curriculum embeds media literacy, and in Northern Ireland (United Kingdom) (26%) (Figure 17).

WHICH CROSS-CURRICULAR COMPETENCIES DO COUNTRIES/JURISDICTIONS MOST COMMONLY SELECT?

In addition to translating societal needs through cross-curricular themes, as described above, countries/jurisdictions can also take an outcomes-based approach, by focusing on cross-curricular competencies. Figure 18 provides an overview of the main types of cross-curricular competencies that countries/jurisdictions articulate in their curricula. Some of the most frequent competencies, including "**social/civic and global competency**", "**co-operation and collaboration**", and "**communication**" reflect efforts to prepare students to successfully navigate an increasingly globalised world. Less common, however, were the competencies of "**information/data literacy**" and "**literacy for sustainable development**" which will be necessary for confronting major societal changes and global challenges.

Figure 18 **Types of cross-curricular competencies reported by countries/jurisdictions**
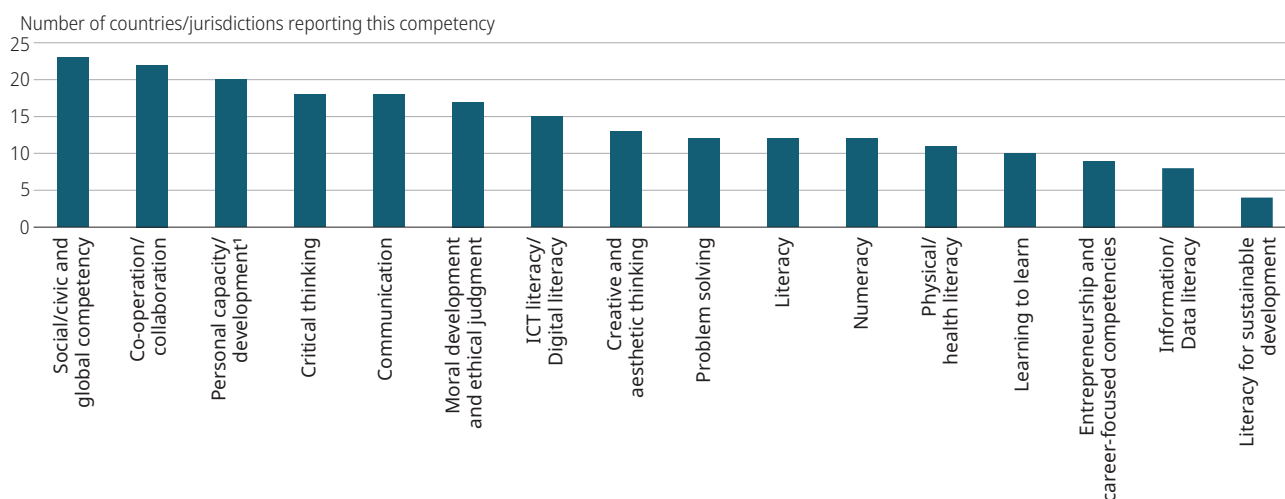
Note: Values displayed include only countries/jurisdictions with responses that could be clearly coded as yes/no. Ordered in descending order of number of countries reporting this competency.

1. Personal capacity/development: i.e. self-regulation/self-control, autonomy

Source: Data from the PQC, item 1.1.2.

StatLink ᵍᵗᵍˢ https://doi.org/10.1787/888934195948

Countries/jurisdictions vary with respect to the number of cross-curricular competencies that they articulate and embed in curriculum, ranging from just three in British Columbia (Canada) ("Communication", "Thinking" and "Personal and social competency"), Denmark ("Understanding of citizenship", "Sustainability" and "Understanding of own and others' cultures) and South Africa ("Personal and social well-being", "Physical education" and "Creative arts") to 21 competencies in Sweden (Table WEB 13[3]).

HOW DO COUNTRIES/JURISDICTIONS EMBED CROSS-CURRICULAR COMPETENCIES INTO EXISTING CURRICULUM?

Countries/jurisdictions vary as to the specific ways in which they embed in their curricula the cross-curricular competencies presented in Figure 18 above. The following sections describe how the cross-curricular competencies of "local and global citizenship/peace", "taking responsibility", "co-operation and collaboration", "reconciling tensions and dilemmas", "creating new value", "data literacy", and "financial literacy are embedded into the curricula of the countries/jurisdictions that participated in the curriculum content mapping exercise.

### Local and global citizenship, peace

Global competency is defined as the capacity to examine local, global and intercultural issues, to understand and appreciate the perspectives and worldviews of others, to engage in open, appropriate and effective interactions with people from different cultures and to act for collective well-being. In a world increasingly scarred by threats to civilian life and peace, there is an urgent need for students to develop global competencies, including empathy, tolerance and respect for others.

Indeed, promoting peace and sustainable development through education is now enshrined in the **United Nations Sustainable Development Goal Target 4**. Global competency is widely recognised as an important tool for navigating the 21st century, and assessment frameworks such as the **PISA global competence framework** have explored to support the quality, equity and effectiveness of educational systems to create a shared respect for human dignity (OECD, 2019[4]).

The degree to which countries/jurisdictions consistently embed these items in traditional subjects (Figure 19) is typically within 20% to 30% of the curriculum areas and ranges from 8% to 57%.

Figure 19 **Global competency in curricula**

Distribution of content items in the mapped curricula targeting global competency (as main or sub target), by learning area
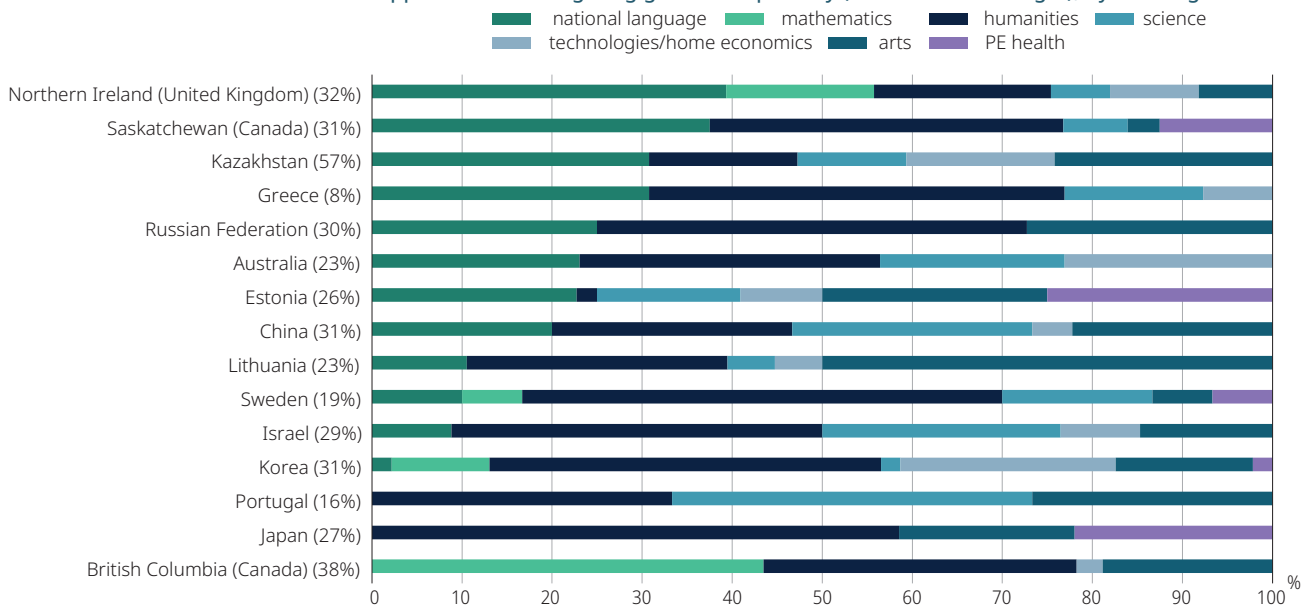
Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.

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

StatLink ᵃˢᵖ https://doi.org/10.1787/888934195967

Global competency is embedded across many of the learning areas, with humanities, national languages, science and the arts being the largest domains. Only Greece (8%), Portugal (16%) and Sweden (19%) have global competency embedded in less than 20% of the mapped curriculum.
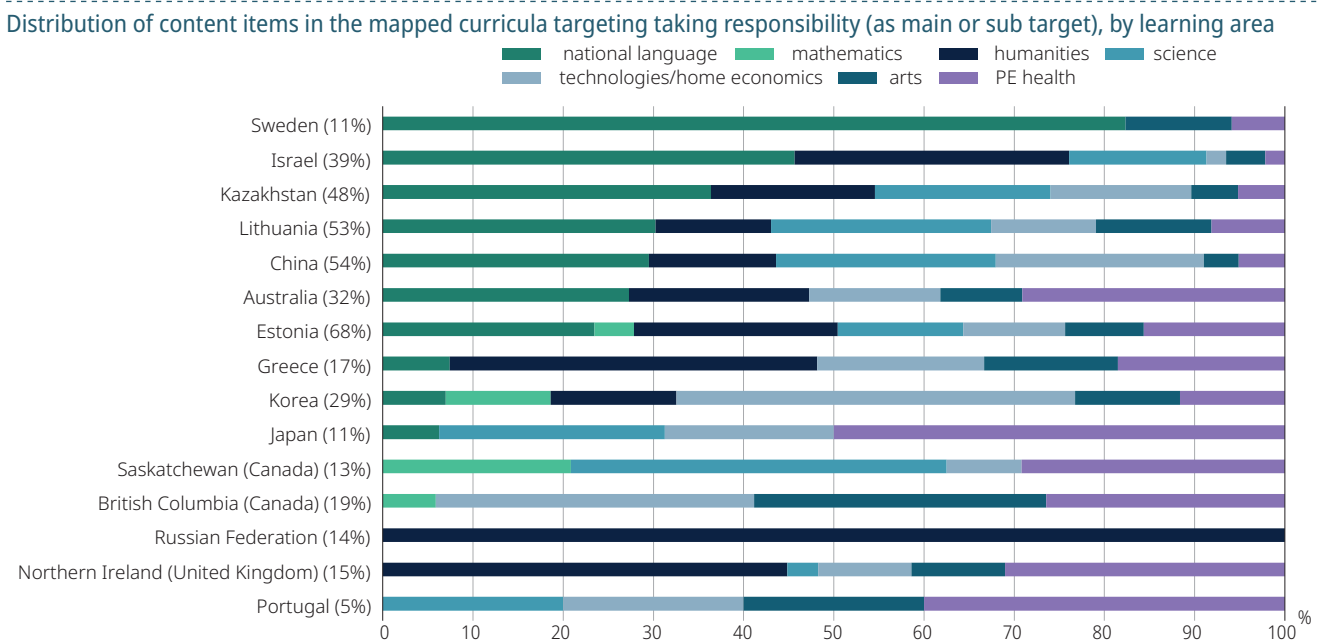
Taking responsibility

As globalisation continues and advances in artificial intelligence change the labour market, people will need to rely even more on their capacity for creativity and take responsibility for their own learning throughout their life. Achievement at school also depends on a number of social and emotional skills, such as responsibility. The concept of "taking responsibility" refers to the ability to act responsibly for a good cause, building on principles and integrity for individual and collective well-being.

The degree of representation of responsibility in national curricula varies among countries/jurisdictions with the highest figures in Estonia (68%) and China (54%) and the lowest in Portugal (5%) (Figure 20). Japan, which already covers this concept in a separate study area (Special studies), still includes it in a total of 11% of content across national language, science, technologies/home economics and physical education/health. Students are also often encouraged to take responsibility through extra-curricular activities, such as clubs or volunteering opportunities.

Other areas that countries/jurisdictions have developed include interdisciplinary courses and activities, such as courses in International co-operation, Social entrepreneurship, and Production and development of commodities and services offered in Norway.

Special activities comprise diverse opportunities for students to actively engage in school life through student council and co-operating in activities such as the preparation of lunches or cleaning of classrooms. Portugal proposes opportunities to learn about institutions and democratic participation, and Kazakhstan includes classes on law at ISCED 3 level. What these subjects have in common is that they often foster collaboration and involve students taking on responsibilities. Some also concern the creation of new value by students or building of trust between students and/or in local and national institutions.

Figure 20 **Taking responsibility in curricula**

Distribution of content items in the mapped curricula targeting taking responsibility (as main or sub target), by learning area

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

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

StatLink 🖳 https://doi.org/10.1787/888934195986

Co-operation/collaboration

Taking responsibility in a class context is also linked to collaborating successfully with others. Collaboration is a strong predictor of overall student well-being and perceptions of success. Students' abilities to collaborate and work well in a team or a group are often deemed character traits and skills, rather than moral values or attitudes, but they are nonetheless malleable and can be fostered in schools. The OECD Study on Social and Emotional Skills also makes an explicit connection to the importance of collaboration for student success and well-being (Kankaraš and Suarez-Alvarez, 2019[5]).

While high degrees of co-operation/collaboration and teamwork are more common in curricula, particularly in Korea (71%) and Northern Ireland (55%) (Figure 21), other countries, such as Norway, have created specific subjects to reinforce, for example, the theoretical underpinnings of international co-operation.

Across all the participating countries/jurisdictions, collaboration is widely and relatively uniformly embedded across multiple learning areas, with the exception of mathematics. Other ways to support collaboration and teamwork in schools lie in the use of more co-operative pedagogies, such as project-based learning, and the provision of extra-curricular opportunities involving collaboration, such as drama clubs.

Figure 21 **Co-operation/collaboration in curricula**

Distribution of content items in the mapped curricula targeting co-operation/collaboration (as main or sub target), by learning area
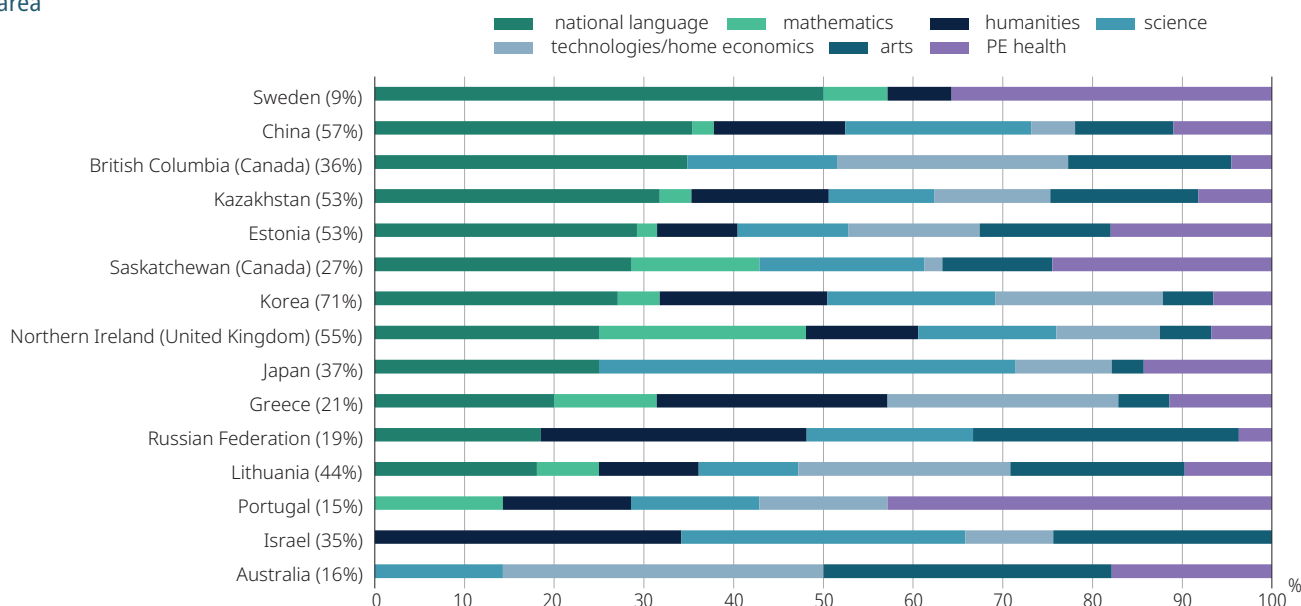
Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.
Source: Data from the Education 2030 Curriculum Content Mapping exercise.
StatLink https://doi.org/10.1787/888934196005

Reconciling tensions and dilemmas

Reconciling tensions and dilemmas means taking into account the many interconnections and inter-relations between seemingly contradictory or incompatible ideas, logics and positions, and considering the results of actions from both short-term and long-term perspectives. Through this process, students acquire a deeper understanding of opposing positions, develop arguments to support their own position and find practical solutions to dilemmas and conflicts. Living in a digitalised world requires reconciling tensions, such as the paradox of a world that is increasingly interconnected and the rise of social isolation, or the emergence of a "post-truth" culture in an era of a nearly limitless media sources.

Relative to other transformative competencies, reconciling tensions and dilemmas is given only a modest focus in curricula. It is represented within only 3% to 33% of content items in the mapped curricula of the countries/jurisdictions (Figure 22).

Dilemmas for which students need to consider competing viewpoints are more frequently presented in curricula within humanities and national language. Mathematics and science, learning areas traditionally regarded as exact, are rarely used in curricula as

platforms for students to reconcile tensions and dilemmas. One exception is the curriculum of Saskatchewan (Canada), where mathematics is frequently used to foster this transformative competency. In some countries/jurisdictions, such as Portugal, science and humanities are used almost equally to encourage students to reconcile tensions and dilemmas.

Figure 22 **Reconciling tensions and dilemmas in curricula**

Distribution of content items in the mapped curricula targeting reconciling tensions and dilemmas (as main or sub target), by learning area
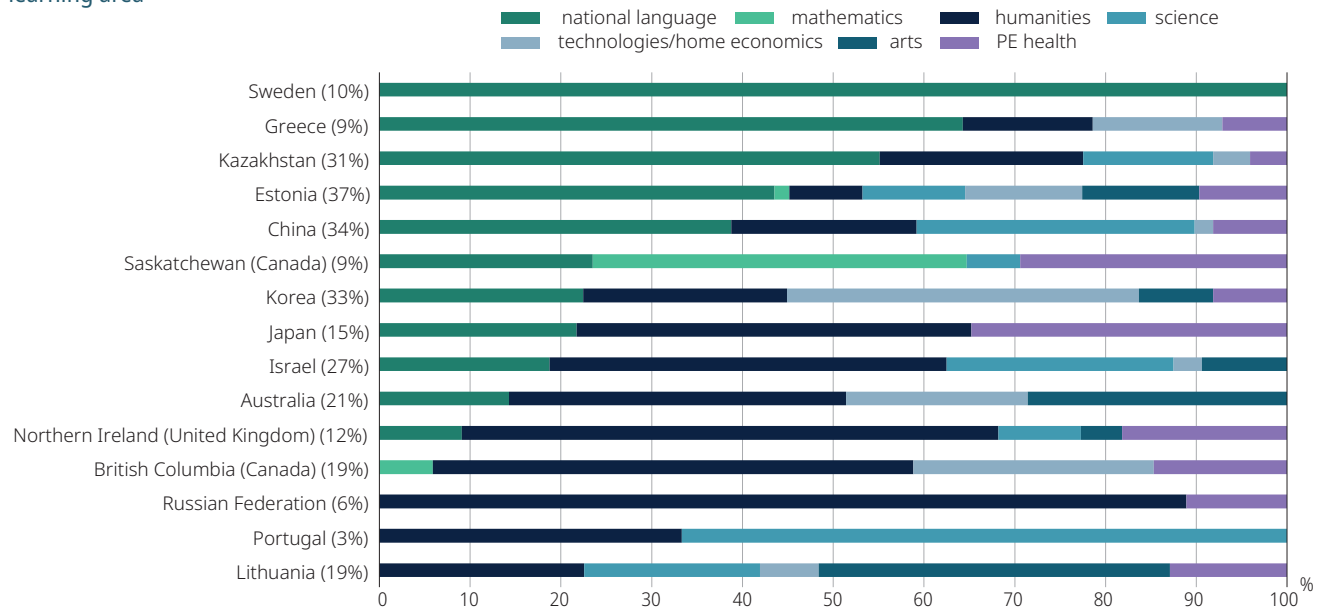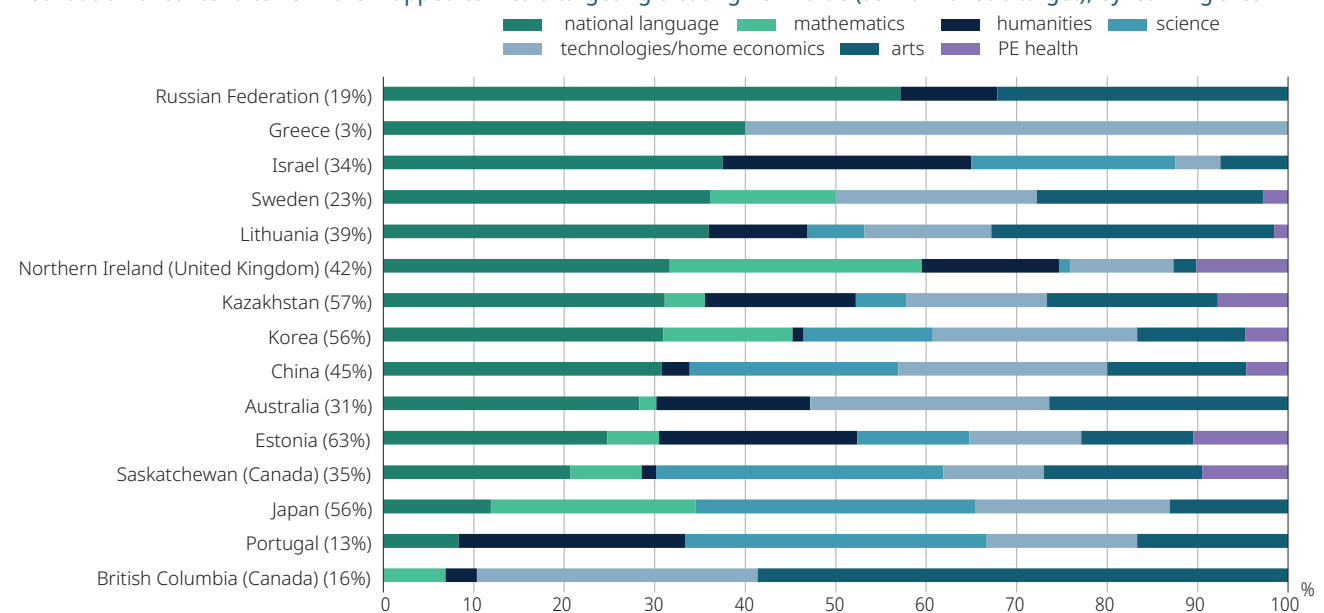

Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.

Source: Data from the E2030 Curriculum Content Mapping exercise.

StatLink 🖳 https://doi.org/10.1787/888934196024

Figure 23 **Creating new value in curricula**

Distribution of content items in the mapped curricula targeting creating new value (as main or sub target), by learning area

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

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

StatLink 🖳 https://doi.org/10.1787/888934196043

Creating new value

The transformative competency of "creating new value" refers to the ability to add value to society by identifying new sources of growth to prepare for 2030, such as developing new solutions, new products and services, new jobs, new processes and methods, new ways of thinking and living, new enterprises, new sectors, new business models and new social models. This competency is necessary in societies that continue to become more diverse and more interdependent, and in economies where the impact of new technologies requires new levels of skills and human understanding. Jobs that require creative intelligence are less likely to be automated in the next couple of decades (Berger and Frey, 2015[2]).

While a majority of countries/jurisdictions recognise the importance of this competency, only some have already acted on it. The degree of mapped curriculum tied to creating new value is typically moderate, ranging from 3% to 63%. Most countries report levels above 30%. Estonia (63%) and Kazakhstan (57%) show the highest occurrence of creating new value across learning areas (Figure 23).

Many countries/jurisdictions embed the competency of creating new value in national languages, technologies/home economics and arts. Norway, for example responds to the need for students to acquire this competency by proposing the subject of "Production and development of commodities and services".

Data literacy

Data literacy is the ability to derive meaningful information from data, to read, work with, analyse and argue with data, and to 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[6]). Data literacy is a part of the core cognitive foundation of the OECD Learning Compass 2030. Data are being produced at unprecedented rates, and learners need the ability to process, interpret and generate data in order to learn and create.

Information/data literacy is explicitly embedded as a cross-curricular competency in Ireland, Korea, Northern Ireland (United Kingdom), Portugal, Poland, Québec (Canada), Sweden and Singapore. No country/jurisdiction participating in the PQC explicitly embedded this topic as a cross-curricular theme or as a stand-alone subject.

Data literacy is consistently present in content items within mapped curricula of countries/jurisdictions participating in CMM (Figure 24). In most of them, it is embedded in almost 20% of the mapped content items, and in Kazakhstan in as much as 70% of the curriculum, followed by Estonia, the Russian Federation and British Columbia (Canada), all with over 50% of the mapped curriculum embedding this competency.

In Kazakhstan, the two most emphasised learning areas for the development of data literacy are mathematics (26% of the items) and national language (18%). In Estonia, the two most prominent areas for data literacy are national language (26%) and science (27%). In the Russian Federation, a single area, mathematics, carries over 40% of the items that foster data literacy. In British Columbia (Canada), mathematics (29%) and humanities (27%) are the areas that play the biggest role in developing data literacy.

In a subset of countries/jurisdictions, one STEM subject is privileged as the main home for data literacy, carrying at least 40% of the items that embed that competency: mathematics in Saskatchewan (Canada), Portugal and Russian Federation; science in China, Israel and Lithuania; and technology/home economics in Greece.

In contrast, in Japan, the strongest role is given to national language, which carries 62% of the items that embed data literacy. This is reflected in subject-specific education goals. In Japan, information management is frequently highlighted as a specific-subject goal in languages.

Financial literacy

In light of global trends, schools 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. Particularly following the global financial crisis in 2008, some sectors of society called for schools to develop students' financial literacy, and it is considered a 21st century skill within the PISA assessment framework (OECD, 2017[7]).

Despite the increasing importance of financial literacy, only Ontario (Canada) reported in PCQ to explicitly embed it as a cross-curricular competency in its curriculum (Table WEB 13)[4]. Mexico, Ontario (Canada) and Argentina reported to include it as a cross-curricular theme (Table WEB 12)[5]. Financial education is rarely a stand-alone mandatory subject as the strategy most often followed by countries who explicitly include it in the curriculum is to embed it into existing subjects (OECD, 2019[8]).

Figure 24 **Data literacy in curricula**

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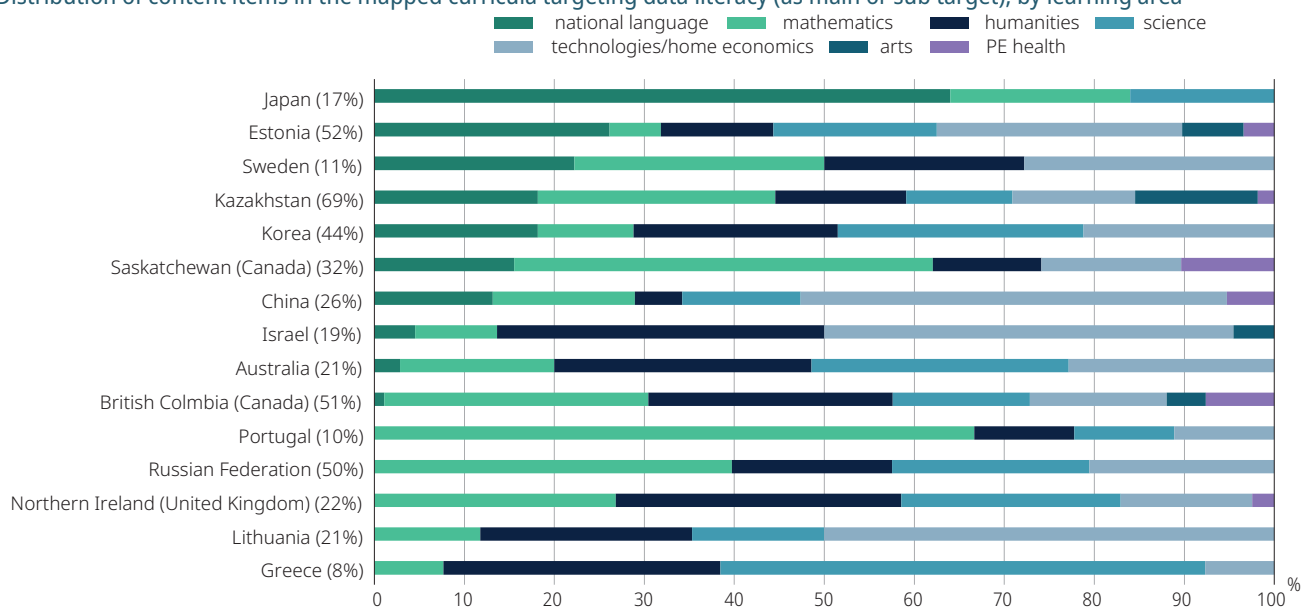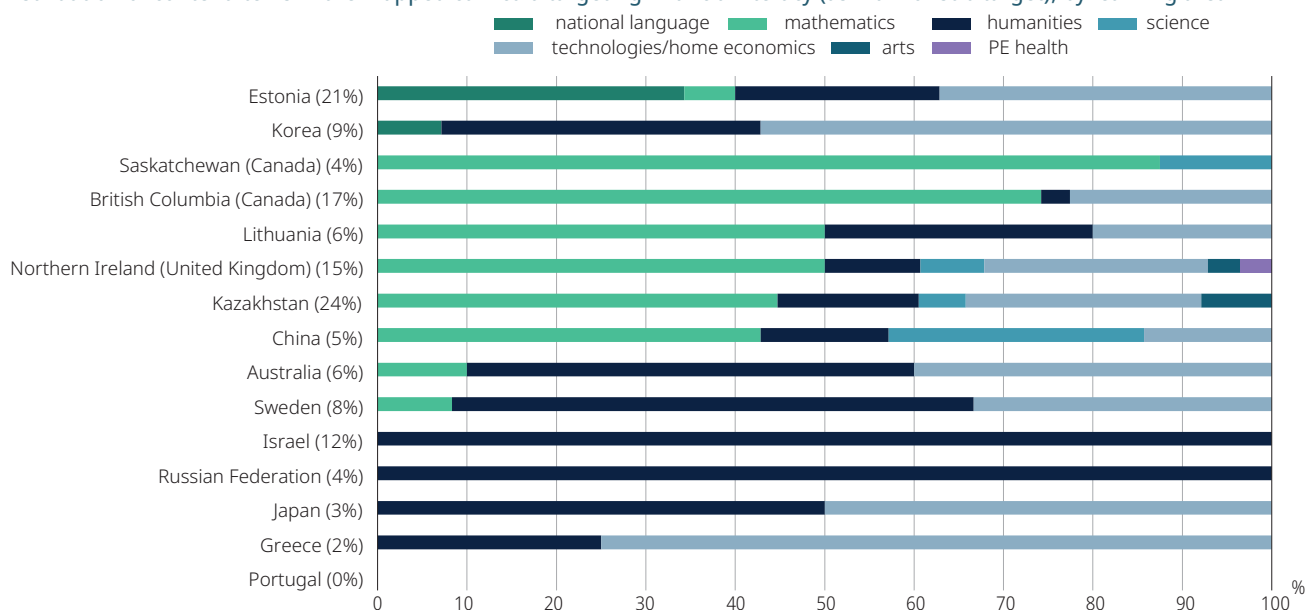

Note: The percentage next to the name of the country/jurisdiction refers to the total percentage of the mapped curriculum that embeds the competency. Ordered by decreasing percentage of items mapped in national language.

Source: Data from the E2030 Curriculum Content Mapping exercise.

StatLink ᵃᵢˢᵖ https://doi.org/10.1787/888934196062

Figure 25 **Financial literacy in curricula**

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

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

Source: Data from the E2030 Curriculum Content Mapping exercise.

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> Box 3 **Effects of a new financial literacy programme on student performance**
>
> The effects of exposing students to new literacies are not always clear-cut. In recent years, different OECD countries have included financial literacy programmes in their schools. However, PISA results reveal that there is no correlation between exposure to financial literacy programmes at school and scores on the PISA financial literacy test (OECD, 2014[9]; OECD, 2019[3]).
>
> What are the possible explanations? In the first place, it may be that governments or schools decide to target financial literacy programmes to schools where financial illiteracy is more common, making comparisons difficult (OECD, 2019[3]). Evidence also suggests that students' performance on financial literacy is associated with a wider set of factors, including their family's socio-economic background or societal habits in the communities where they are raised. Indeed, over seven in eight students in every country/economy participating in PISA reported that they receive financial information from their parents, and over two in three students reported that they talk to their parents about their own spending and saving decisions (OECD, 2019[3]).
>
> The weak association between financial literacy performance and financial education may also stem from gaps in curriculum implementation. Most participating countries/economies have enacted national strategies for financial education, but these strategies often give regions, schools and teachers considerable discretion on whether and how to incorporate financial education into lessons. Indeed, financial literacy has emerged only relatively recently as a relevant skill for students and society at large, and it competes for space in already overcrowded school curricula and student timetables with other important skills, such as global citizenship and critical thinking (OECD, 2019[3]). Integrating it successfully will probably require designing curriculum delivery strategies that account for and balance these competing pressures, together with sound evaluation mechanisms to measure the impact of curriculum redesign on students' performance. However, the PISA analysis suggests that creating a specific programme itself may not necessarily be a silver-bullet solution.

Among the mapped in CCM that are motivated by the challenges and demands of the contemporary world, financial literacy is also one of the least targeted in the mapped curricula (Figure 25). Only two countries, Estonia and Kazakhstan, embed it in more than 20% of the mapped curriculum. In most other countries/jurisdictions, financial literacy is present in less than 10% of the mapped curriculum.

In contrast to ICT/digital literacy, emphasis on financial literacy is limited to a narrower set of learning areas in most countries and jurisdictions. Some include it exclusively in one or two learning areas. In Israel and the Russian Federation, it is exclusively embedded in the humanities. In Saskatchewan (Canada), it is mostly embedded in mathematics, with a small percentage of items in science. In Greece and Japan, it is mostly embedded in humanities and technologies/home economics. There is no clear-cut relationship between the exposure of students to a financial literacy programme and the actual student performance (see Box 3), and therefore curriculum designers can be reminded of the general rule 'the more is not the better'.

HOW DO COUNTRIES/JURISDICTIONS STRUCTURE AND DESCRIBE SUBJECT-SPECIFIC GOALS?

Curriculum misalignment can have a substantial impact on curriculum overload. Lack of clarity regarding curriculum changes and their intentions may cause confusion among teachers about the relationship between traditional and newly introduced components of the curriculum. This confusion can force teachers to prioritise one or the other (Voogt, Nieveen and Klopping, 2017[10]).

One example is the 2007 New Zealand Curriculum, in which teachers did not receive guidance on how to connect 21st century competencies with a subject-based curriculum. They thus perceived it as two separate curricular requirements (Sinnema, 2011[11]; Insook and Kang, 2017[12]; Voogt, Nieveen and Klopping, 2017[10]), which led some teachers to prioritise one aspect over the other, thereby undermining the intent of the curriculum.

How countries structure and describe subject-specific goals can result in content overload. If teachers and school leaders fail to understand the demands of the new curriculum and lack the ability to adapt it to their local context in meaningful ways, students may be left with an unmanageable amount of content to be learned. This is likely to lead to a sense of overload, a lack of purpose and overall dissatisfaction with school life. When subject-specific goals are reinforced by grades, stages as well as achievemet levels, and are described too detailed with too much specifications, teachers may feel the pressure to teach materials that will meet all the goals set out in the curriculum. As a result, students may experience content overload. On the contrary, when goals are specified much less but without clear guidelines nor sufficient support for teachers, they may feel pressured to provide their own specifications, in particular, where from which students may also experience content overload.

The majority of countries and jurisdictions organise subject-specific goals by grades, while several others (e.g. Mexico, Scotland [United Kingdom], Sweden, Singapore and Russian Federation) structure subject goals by achievement levels or benchmarks. Several others combine different approaches. In New Zealand, for example, all learning areas have achievement objectives with the exception of science, which are further differentiated into achievement objectives levels. (Table 5).

While the majority of countries/jurisdictions do not link the objectives with the rubrics/achievement levels, several countries do so. New Zealand, Northern Ireland (United Kingdom), Poland, Sweden, Scotland (United Kingdom), and Russian Federation make these links as a general principle, while others do so rather selectively. For example, Norway chooses to do so for a particular level of education (ISCED 2); Portugal chooses this only for focused learning areas (essential learning); China and Viet Nam for certain subjects.

Across countries/jurisdictions the principles and processes used to set subject-specific achievement objectives vary significantly (Table 6), ranging from holistic statements allowing teachers to further refine objectives in their individual contexts (Australia) to very specific assessment criteria (Finland). Ontario (Canada), for example, sets curriculum expectations, that are designed to be specific, attainable, measurable and relevant. They are measureable based on an achievement chart that includes knowledge and understanding, thinking, communication and application. Achievement of student learning is based on the four levels of the achievement chart, which are then equated to either a letter or a percentage grade.

Some countries/jurisdictions only develop achievement objectives for their core content, as in Chile, Norway, Portugal and Québec (Canada). The objectives are commonly linked in one way or another to national/provincial assessments. Chile, Finland, Ireland, Mexico, Norway and Sweden even emphasise this fact.

Table 5 [1/2] **Structure of subject-specific education goals**

Country/ jurisdiction	By grades	By cycles[2]	By rubrics/ achievement levels
Australia	Yes	Yes, by bands of years	No
British Columbia (Canada)	Yes	No	No
Chile	Yes	Yes, ISCED 1: 1-6, ISCED 2: 7-8, ISCED 3: 1-4 of secondary education	No
Czech Republic	(m)	No	(m)
Denmark	(m)	(m)	(m)
Estonia	Yes	Yes, 1-3, 3-6, 7-9	No
Finland	Yes	No	No
Hungary	Yes	Yes, by stages (primary education: 1-4 and 5-8, secondary: 9-12)	No
Ireland	(m)	Yes, by cycles (Junior Cycle, Senior Cycle, etc.)	(m)
Japan	Yes	No	No
Korea	Yes	No	No
Mexico	No	No	Yes, defined by curriculum standards
Netherlands	Yes, 1-8	No	No
New Zealand	No	Yes	Yes
Northern Ireland (United Kingdom)[1]	Yes	Yes, ISCED 0, ISCED 1: 1-3, 2-5, ISCED 2: 3-7, ISCED 3: GCSE: A-G, Advanced: A-E	Yes
Norway	Yes	Yes, 1-2, 3-4, 5-7, 8-10 (ISCED 1 and 2); at ISCED 3, goals are given at all three years	Yes (for ISCED 2)
Ontario (Canada)	Yes	No	No
Poland	Yes	Yes, by stages (primary 1-3, primary 4-8, general secondary 1-4 or technical secondary 1-5, stage I sectoral vocational 1-3, stage II sectoral vocational 1-2)	Yes, expected at the end of a given stage
Portugal	Yes	No	Subjects with essential learning/core competencies: Yes
Québec (Canada)	Yes, accompanied by progression of learning document	No	No
Scotland (United Kingdom)	No	No	Yes, benchmarks
Sweden	No	No	Yes
Turkey	Yes	Yes, 1-4 (primary), 5-8 (middle), 9-12 (high school)	No
United States[1]	(a)	No	(a)
Wales (United Kingdom)	(m)	No	(m)

Note: 1. Responses for these countries/jurisdictions were submitted by independent researchers, not government administrations.

2. Unless specified otherwise, numbers listed in this column refer to grades.

3. Primary 1 – 3 (lower primary); KS 2: Primary 4 – 6 (upper primary); KS3 : Secondary 1 – 3 (junior secondary); KS4: Secondary 4 – 6 (senior secondary).
Source: Data from the PQC, item 1.1.4.2.

Table 5 [2/2] **Structure of subject-specific education goals**

	Country/ jurisdiction	By grades	By cycles[2]	By rubrics/ achievement levels
Partners	**Argentina**	Yes, 1, 2, 3, 4, 5, 6	No	No
	Brazil[1]	(m)	(m)	(m)
	China (People's Republic of)	English and other foreign languages: Yes	No	Yes
	Hong Kong (China)	No	Yes, by Key Stages[3]	Yes, by learning targets
	Costa Rica	Yes	Yes, by educational cycle (preschool, primary school: I cycle: 1-3, II cycle: 4-6, secondary education: III cycle: 7-9, diversified cycle: 10-11-12)	No
	India[1]	(m)	Yes, by stage	No
	Kazakhstan	Yes	Yes, by ISCED level, vertically coherent	No
	Russian Federation	No	Yes, by stage, primary (1-4, secondary 5-9, high school 10-11)	Yes
	Singapore	No	Yes, by key stage (primary, secondary)	Yes
	South Africa	Yes	Yes, by phase	No
	Viet Nam	Yes	Yes, by stage	Yes, depending on subject

Note: 1. Responses for these countries/jurisdictions were submitted by independent researchers, not government administrations.

2. Unless specified otherwise, numbers listed in this column refer to grades.

3. Primary 1 – 3 (lower primary); KS 2: Primary 4 – 6 (upper primary); KS3 : Secondary 1 – 3 (junior secondary); KS4: Secondary 4 – 6 (senior secondary).

Source: Data from the PQC, item 1.1.4.2.

Table 6 [1/2] **Principles and processes for setting subject-specific achievement objectives**

Country/ jurisdiction	Principles and processes for setting objectives
OECD	
Australia	Describe what students are typically able to understand and do by the end of each year or band of years. Holistic statements that assist teachers to make balanced judgments about the extent and quality of each student's achievement. Aligned to content and validated as part of curriculum development.
British Columbia (Canada)	They are not directly taught or assessed but used to inform the topics chosen. They link back to the goals of the curriculum for each subject area.
Chile	* structured by actionable contents, skills and attitudes * refer to knowledge, skills and attitudes that allow students to advance in their integral development, by understanding their environment and generating the necessary tools to participate actively, responsibly and critically in it * focus on essential aspects of the subjects * accompanied by "assessment indicators" (conceived as observable aspects of learning) to evaluate the performance of the student * each learning objective has several indicators, since there are multiple performances that can demonstrate that a learning has been developed * indicators are a suggestion, so teachers can choose to modify or complement them
Czech Republic	(m)
Denmark	(m)
Estonia	(m)
Finland	Subject-specific achievement objectives are assessment criteria.
Hungary	The framework curricula defines the expected learning outcomes in two-grade cycles. SMART objectives are not given.
Ireland	"Expectations for students" are included in the assessment guidelines that accompany each specification. "Expectations for students" is an umbrella term that links learning outcomes with annotated examples of student work in the subject or short course specification. When teachers, students or parents looking at the online specifications scroll through the learning outcomes, a link will sometimes be available to examples of work associated with a specific learning outcome or with a group of learning outcomes. The examples will include work that is in line with expectations, above expectations or exceptional. The purpose of the examples of student work is to show the extent to which the learning outcomes are being realised in actual cases. Examples of students' work are selected to illustrate expectations and will have been annotated by teachers.
Japan	The achievement objectives are not stipulated clearly, but competencies to be fostered are stipulated in the goals of each subject.
Korea	Korea adopts the grade cluster system, which has been established in order to break from the rigidity of curriculum organisation and implementation and provide flexibility in organising and implementing the curriculum through interactive connection and collaboration between grade levels. The subject-specific education goals in Korea are structured according to the grade clusters. So the subject-specific education goals are same throughout middle school period. The Ministry of Education begins the process of developing evaluation standards according to the new curriculum. A research and development team comprised of subject experts writes the first draft which goes through numerous reviews and a consultation process before being finalised.
Mexico	Curriculum standards are designed to assume the complexity and graduality of learning, define what students will demonstrate at the end of a school term, as referenced to national and international assessments. They are designed using international standards as a reference.
Netherlands	(a)
New Zealand	NZC: All learning areas have achievement objectives (AOs) in eight levels on fold-out charts at the back of the document. NB: Organisation is slightly different in the online version with each set of AOs being included with the learning area statements. TMOA: The achievement objectives successfully identify the skills and knowledge needed to progress learning. The achievement objectives follow the essence statements in each of the learning areas.
Northern Ireland (United Kingdom)[1]	Relate to the development, application and demonstration of cross-curricular and thinking skills and personal capabilities within and across subjects
Norway	At ISCED 2 for core subjects: They describe the quality of competence in a subject and are based on subject-specific competence aims as described in subject curricula. They are designed to function as a support for teachers in the final assessment of their students and to provide a common national framework for assessment work.

Note 1. Responses for these countries/jurisdictions were submitted by independent researchers, not government administrations.

2. In Hong Kong (China), there are curriculum aims/objectives of each of Key Learning Areas/subjects, not limited to "core contents", but these aims and objectives are linked to national assessments for only some of the Key Learning Areas/subjects (English Language, Chinese Language, Mathematics), and at some Key Stages only (i.e. Key Stage 1 – 3). But for Key Stage 4, the curriculum aims/objectives are linked to the national assessment in all subjects. The nature of the national assessments for Key Stage 1 – 3 (mainly for formative assessment for schools' use) is different from that of Key Stage 4 (which includes a university admissions purpose).

Source: Data from the PQC, item 1.1.4.2.

Table 6 [2/2] **Principles and processes for setting subject-specific achievement objectives**

Country/ jurisdiction	Principles and processes for setting objectives
OECD	
Ontario (Canada)	The curriculum expectations are designed to be specific, attainable, measurable, relevant. Expectations are measureable based on an achievement chart which includes knowledge and understanding, thinking, communication and application. Achievement of student learning is based on the achievement chart and the four levels which are then equated to either a letter or a percentage grade.
Poland	(m)
Portugal	They exist mainly the subjects with essential learning.
Québec (Canada)	Define essential knowledge students must acquire and be able to use by the end of each academic year/cycle in terms of subject-specific and cross-curricular competencies. They are set out in the progression of learning document accompanying each secondary school subject.
Scotland (United Kingdom)	(m)
Sweden	Must be clear and distinctly designed so that they contribute to an equal assessment. Should be concrete and evaluable but not designed in such a way that they micromanage schools and teachers or restrict teachers' educational freedom. The level of ambition of the knowledge requirements must be adapted to what is realistic within the framework of the total teaching time. The knowledge requirements are based on the long-term goals of the subjects and describe observable performances corresponding with the abilities stated in the goals.
Turkey	Achievements consist of content dimension and skill dimension. While the achievements are structured, attention has been paid to ensuring that they are as clear as possible (to be understood by everyone alike), a precise and clear single judgment (skill), accessibility, age level, observability and measurability. It includes explanations of the products which are expected to be put forward by the suggestions on the methods and techniques that can be used and on the achievements of the products.
United States[1]	(m)
Wales (United Kingdom)	(m)
Partner	
Argentina	(a)
Brazil[1]	(m)
China (People's Republic of)	(a)
Hong Kong (China)[2]	The process of developing the whole-school as well as KLA and subject curriculum aims, broad learning outcomes and assessment objectives rests with the CDC and its sub-committees for the different KLAs, and for the senior secondary level also with the **Hong Kong** Examinations and Assessment Authority (HKEAA). In the process, feedback is collected from different stakeholders, including education professionals and the general public.
Costa Rica	Specify 13 skills that students must develop in the educational process according to the educational cycles. They are specified in the Education Policy "Educating for a New Citizenship" (2015).
India[1]	(m)
Kazakhstan	Expected outcomes allow learners to define their individual development pathways considering their individual skills. The expected outcomes are classified and systematised by taxonomy levels ("knows", "understands", "applies", "analyses", "synthesises", "evaluates") to ensure the integration of research, cognitive, practical and emotional-aesthetic ways of exploring the world.
Russian Federation	* Cross-curricular results presuppose that students are familiar with interdisciplinary notions and universal educational actions (regulatory, learning and communicative) and acquire the ability to use them in learning and social practices. Besides, students should be able to plan and carry out their learning process independently as well as to collaborate with teachers and peers. * Curricular results presuppose that students have specific skills to each subject knowledge, are aware of types of activities aimed at gaining new knowledge within the subject and able to use this knowledge in learning and project activities. Learning should contribute to development of academic thinking skills, introduce students to major theories, develop students' ability to use academic terminology.
Singapore	Subject-specific goals are based on the disciplinary intent, and reviewed every six years to ensure that the goals are relevant, appropriately sized and meet the needs of students.
South Africa	(m)
Viet Nam	(m)

Note: 1. Responses for these countries/jurisdictions were submitted by independent researchers, not government administrations.

2. In Hong Kong (China), there are curriculum aims/objectives of each of Key Learning Areas/subjects, not limited to "core contents", but these aims and objectives are linked to national assessments for only some of the Key Learning Areas/subjects (English Language, Chinese Language, Mathematics), and at some Key Stages only (i.e. Key Stage 1 – 3). But for Key Stage 4, the curriculum aims/objectives are linked to the national assessment in all subjects. The nature of the national assessments for Key Stage 1 – 3 (mainly for formative assessment for schools' use) is different from that of Key Stage 4 (which includes a university admissions purpose).
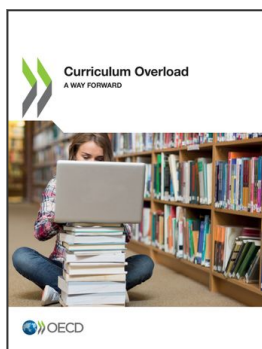
Source: Data from the PQC, item 1.1.4.2.

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Notes

1. The section compares available OECD data and data collected through the OECD Future of Education and Skills 2030 Policy Questionnaire on Curriculum Redesign (PQC) and Curriculum Content Mapping (CCM) exercises on all four dimensions of curriculum overload. This international comparative data can be a starting point for policy makers to inform their efforts in curriculum design and redesign.

2. Table WEB 12. Cross-curricular themes reported by countries/jurisdictions, StatLink: https://doi.org/10.1787/888934196100.

3. Table WEB 13. Cross-curricular competencies reported by countries/jurisdictions, StatLink: https://doi.org/10.1787/888934196119.

4. Table WEB 13. Cross-curricular competencies reported by countries/jurisdictions, StatLink: https://doi.org/10.1787/888934196119.

5. Table WEB 12. Cross-curricular themes reported by countries/jurisdictions, StatLink: https://doi.org/10.1787/888934196100.

References

Berger, T. and C. Frey (2015), *Future Shocks and Shifts: Challenges for the Global Workforce and Skills Development*, OECD Publishing, Paris, http://www.oecd.org/education/2030-project/about/documents/Future-Shocks-and-Shifts-Challenges-for-the-Global-Workforce-and-Skills-Development.pdf (accessed on 3 November 2020). [2]

Carlson, J. et al. (2011), "Determining data information literacy needs: A study of students and research faculty", *portal: Libraries and the Acade*my, Vol. 11/2, pp. 629-657, http://dx.doi.org/10.1353/pla.2011.0022. [6]

Insook, C. and H. Kang (2017), "Embedding key competencies in schooling using the new approaches of competency-based curriculum in New Zealand", *Secondary Education Research*, Vol. 65/3, pp. 601-631, http://dx.doi.org/10.25152/ser.2017.65.3.601. [12]

Kankaraš, M. and J. Suarez-Alvarez (2019), "Assessment framework of the OECD Study on Social and Emotional Skills", *OECD Education Working Papers*, No. 207, OECD Publishing, Paris, https://dx.doi.org/10.1787/5007adef-en. [5]

OECD (2019), *OECD Future of Education 2030: Making Physical Education Dynamic and Inclusive for 2030. International curriculum analysis*, OECD, Paris, https://www.oecd.org/education/2030-project/contact/OECD_FUTURE_OF_EDUCATION_2030_MAKING_PHYSICAL_DYNAMIC_AND_INCLUSIVE_FOR_2030.pdf. [1]

OECD (2019), *OECD Future of Education and Skills: Concept Note Core Foundations for 2030*, OECD, Paris, https://www.oecd.org/education/2030-project/teaching-and-learning/learning/core-foundations/Core_Foundations_for_2030_concept_note.pdf. [3]

OECD (2019), *PISA 2018 Assessment and Analytical Framework*, PISA, OECD Publishing, Paris, https://dx.doi.org/10.1787/b25efab8-en. [4]

OECD (2019), *Policy Handbook on Financial Education for Young People in the Commonwealth of Independent States*, OECD Publishing, Paris, www.oecd.org/daf/fin/financial-education/financial-education.htm. [8]

OECD (2017), *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematic, Financial Literacy and Collaborative Problem Solving*, Revised edition, OECD Publishing, Paris, https://doi.org/10.1787/9789264281820-en. [8]

OECD (2014), *PISA 2012 Results: Students and Money (Volume VI)*, Organisation for Economic Co-operation and Development, Paris, http://www.oecd-ilibrary.org/content/book/9789264208094-en. [9]

Sinnema, C. (2011), *Monitoring and Evaluating Curriculum Implementation: Final Evaluation Report on the Implementation of the New Zealand Curriculum 2008-2009*, Ministry of Education. [11]

Voogt, J., N. Nieveen and S. Klopping (2017), *Curriculum Overload: A Literature Study*, Unpublished OECD Reference Document, https://thehub.swa.govt.nz/assets/documents/42417_Monitoring-Evaluating-web-06042011_0.pdf. [10]