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DIRECTORATE FOR EDUCATION AND SKILLS
EDUCATION POLICY COMMITTEE

Future of Education and Skills 2030:

Draft concept note on Megatrends, Learning Compass 2030 and Student Agency/ Co-agency

8th Informal Working Group (IWG) Meeting
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The working group members who contributed to the draft from the working groups on Future We Want, Student Agency/ Teacher Agency/ Co-agency include: Ingrid Schoon, Vishal Talreja, Yuhyun park, Namji Steinemann, Archana Iyer, Katariina Salmela-Aro, Charles Leadbeater, Abiko Tadahiko, Ruben Laukonnen.

This is still a "working document" to be discussed and refined during the during the 8th IWG meeting on 29 October 2018. For ACTION: participants are invited to:

SUGGEST which figures/ visuals are worth keeping, SUGGEST figures/=visuals you find powerful to be added SUGGEST figures/ visuals you find powerful to be added on the section "mega trends".

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- Mega trends towards 2030 and demands analysis

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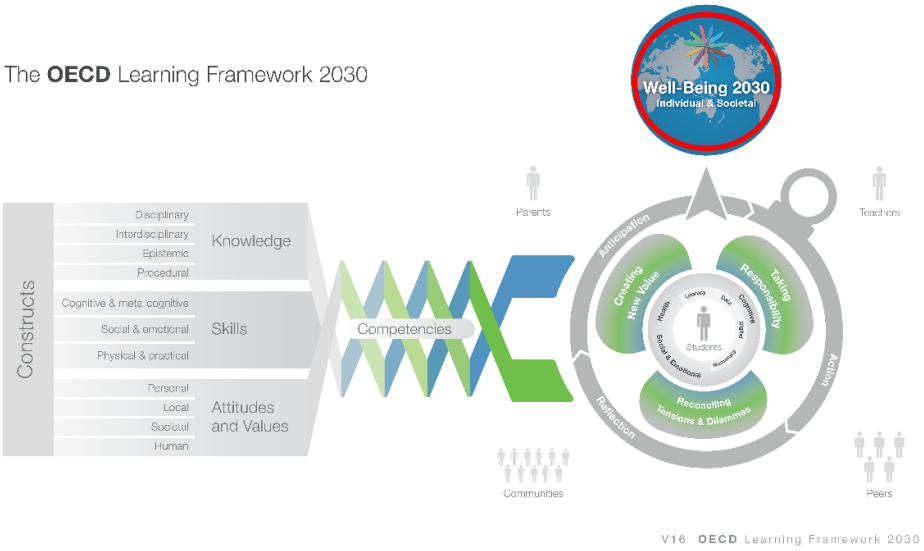
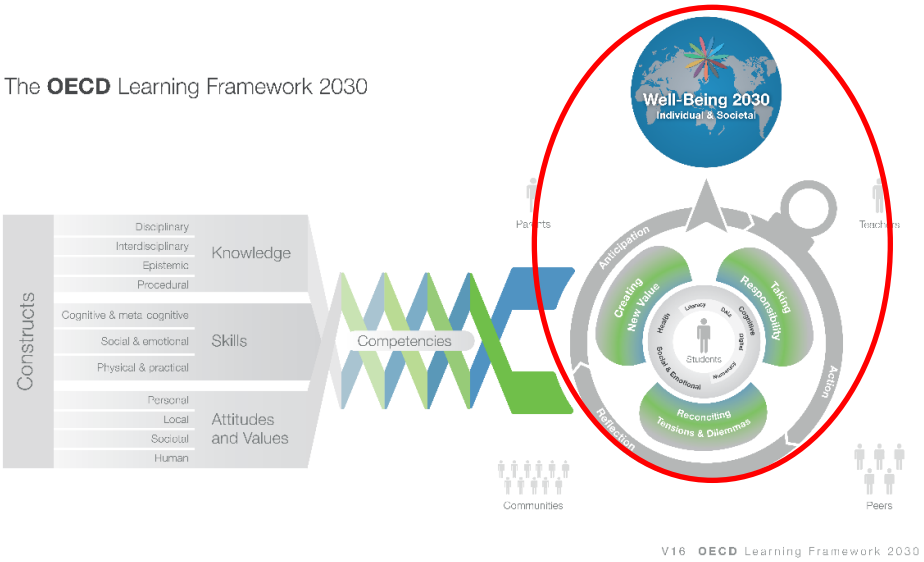


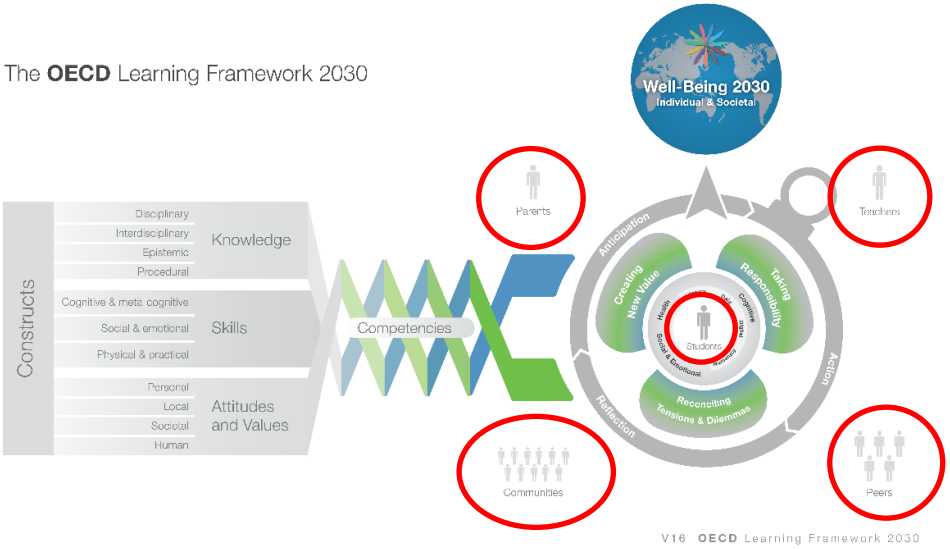
- The Learning Compass 2030

Figure 2. The Learning Compass 2030



- Student Agency and Co-Agency

Figure 3. Student Agency and Co-Agency



Mega trends towards 2030

Contexts and scope

The world is evolving at an incredible speed. Mega trends refer to the current trends that predict what the world in 2030 would look like, such as globalisation, technological and climate change, which create numerous challenges and opportunities. The pace at which these changes are happening makes the world more and more volatile (liable to change rapidly and unpredictably, especially for the worse), uncertain (not known or definite), complex (consisting of many different and connected parts) and ambiguous (open to more than one interpretation). They will tune and shape the way education should be delivered for the most efficient results by 2030.

Some of the key mega trends are presented in line with the 11 areas of the OECD Well-being Framework, which includes: jobs, income, housing, work-life balance, safety, life satisfaction, health, civic engagement, environment, education and community.

Figure 4. The OECD's Better Life Index

Note to the reader: the figures presented in the section are currently under review if they are useful and powerful to be included in this concept note. The participants are invited to:

- SUGGEST which figures/ visuals are worth keeping
- SUGGEST figures/ visuals you find powerful to be added

Box. Key messages on mega trends

In each area of the OECD Well-being Framework

- Jobs: due to digitalisation and automation of tasks, some sectors are likely to lose jobs, replaced by machines.
- Income: the income gap between rich and poor is getting wider and wider.
- Housing: living in a secured place with decent conditions is getting harder and harder.
- Work-Life Balance: although people spend more and more time at work, they still value quality leisure time.
- Safety: threats such as safety walking at night or terrorism, as well as emerging threats such as cyber-bullying both make the world more VUCA.
- Life satisfaction: the advancement of technology contributes to life satisfaction.
- Health: although children's health is affected by obesity, teenage suicide rate has decreased.
- Civic engagement: there is low confidence in national governments.
- Environment: water quality, air pollution and biodiversity have emerged as relevant challenges.
- Education: advancement of technology creates important changes in education.
- Community gets more diverse.

Demands analysis

- Employers' demands on students competencies include: human and meta skills in time of automation and digitalization; core concept in modern disciples, such as entrepreneurship and wellness, taught in a modern way, for example using an interdisciplinary approach. with essential content so as to understand the world; skills to manage themselves including reskilling and upskilling for life-long learning; knowledge to use AI to make the most out of it; skills for non-routine interpersonal and non-routine analytic jobs.
- Teachers' demands on students competencies include: disciplinary knowledge so that they are equipped with the basic knowledge; management skills such as cognitive and meta-cognitive skills, social and emotional skills, and physical and practical skills, which are more and more needed in society and in the workforce; attitudes and values such as tolerance and good behaviour towards the other.
- Parents' demands on students competencies include: learning academic knowledge and traditional core subjects such as math, reading, writing, and sciences to thrive in their workplace, management skills such as technology skills, cognitive and social-emotional skills; attitudes and values such as respect for self and others, honesty, compassion, love for one another, tolerance, global awareness and perspective, cultural sensitivity and the pursuit for life satisfaction through the sense of agency.

- Students present different needs, focus and interests depending on different stages of their development and education. At a young age, they want education to be fun, social, practical and a place where they can learn a variety of knowledge. In secondary education, they want education to be career focused and in post-secondary education, they want education to be job market oriented in order to facilitate their integration on the job market.
- In comparison across different demands, parents, students and faculty rank the ability to adaptive thinking skills, to convey thoughts effectively and being emotionally well as their top priority of what they see as critical for the future.
- In comparison between teachers and students, they have different skills priorities. Teachers value fundamental skills whereas students want to learn more hands-on and related to employability skills.

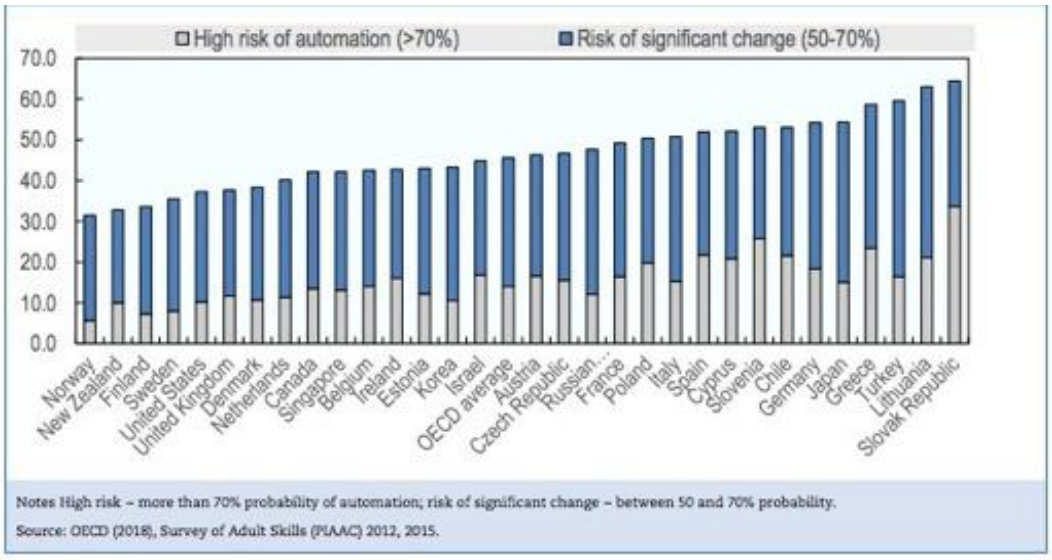
Jobs: due to digitalisation and automation of tasks, some sectors are likely to lose jobs, replaced by machines.

Having a job highly contributes to a person's well-being as it not only brings financial stability and economic benefits, but also enables a person to build skills and competencies, stay connected with society and develop confidence.

Jobs involving laborious and repetitive tasks get automated.

There are many countries where a large proportion of jobs are at risk of being automated. In other words, there is a risk of high unemployment especially among low-skilled workers. Although technological changes can improve workers life and perform laborious tasks, in the manufacturing sector especially, being replaced by digital devices and software still create volatility and uncertainty for people who are traditionally part of that workforce.

Figure 5. Large Shares of Jobs are at risk of automation or significant change



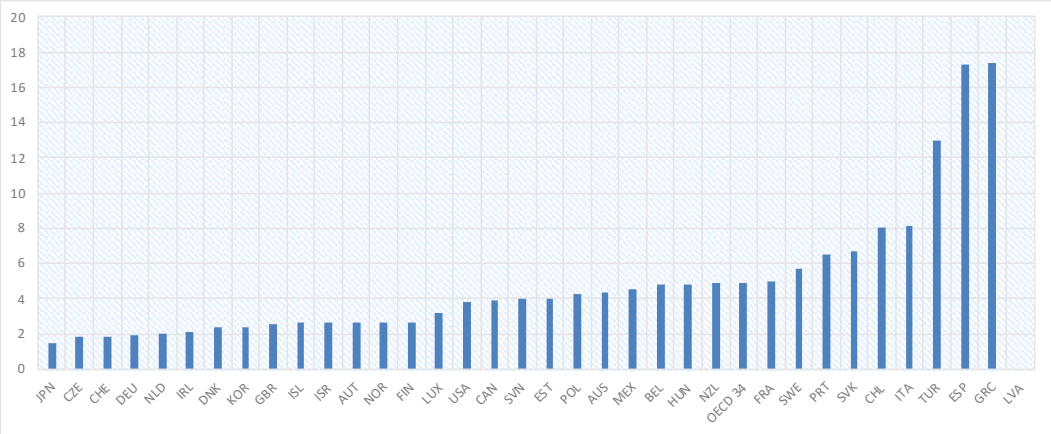
The OECD survey shows that the risk of automation is less important in countries with high-skilled workers, such as Norway, Finland and Sweden, where the risk of having an automation risk of more than 70% is some of the lowest (less than 10%). However, Slovak Republic and Slovenia have some of the highest risk of automation, which can go up to 30% and present very risks of unemployment.

Since the risk of unemployment is getting higher, people need to learn skills such as computer and digital skills.

Partly due to the digitalisation of tasks, the labour market security got worse in most OECD countries. This reflects a substantially higher risk of unemployment. The situation in Greece and Spain are particularly alarming as their job market insecurity reaches almost 18%.

Figure 6. Labour market insecurity

Average expected monetary loss associated with becoming and staying unemployed, as a share of previous earnings



Note: The OECD average is population-weighted; its time series excludes Chile, Korea, Latvia, Portugal, the Slovak Republic and Sweden, due to incomplete time series. The OECD average for the latest available year excludes Latvia. Source: OECD Job quality (database), http://dotstat.oecd.org/Index.aspx?DataSetCode=JOBQ

Unemployment touches industries as broad as manufacturing transport and financial services (Richard Dobbs, James Manyika, and Jonathan Woetzel, 2015[1]) and has kept on fluctuating since the financial crash in 2008. However, the major trend is not unemployment but under-employment. There is less and less job security since the gig economy and "flexible economy" appeared (OECD, 2015[2]). The share of productivity on a global scale produced not by technology but human labour has gone down (Loukas Karabarbounis and Brent Neiman, 2013[3]).

Although technology advancement makes the labour market unstable and uncertain, the probability that many existing jobs would disappear is very high. In addition to this, the jobs that will replace them would require high technological literacy and low human interactions. Therefore, developing digital and computer skills is necessary to thrive in today's technology-driven society.

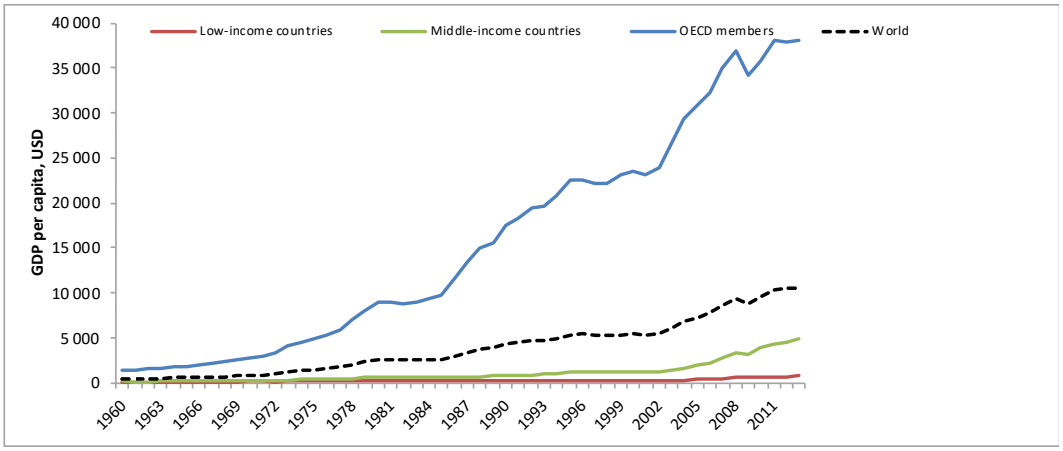
Income: the income gap between rich and poor is getting wider and wider.

Although money might not buy happiness, it stays an important aspect of life and well-being. Higher income leads to better living conditions, and thus to greater well-being.

The growing income inequality is partly due to the rise of developing countries, such as China.

Figure 7. Gap between richer and poorer regions widens

GDP per capita by national income level and OECD member countries, 1960-2014



Note: GDP per capita is gross domestic product divided by midyear population. Data are in current US dollars.
Source: World Bank (2015), "GDP per capita", *World Development indicators*

During the past years, the income gap between the poor and the rich has become wider (Piketty, T. and Goldhammer, A, 2014[4]). Branco Milanovic, the expert in globalisation, found in 2016 that one of the reasons of the global inequality trend was due to the rise of China, which the wealth of eight of their richest men equals the one of 3.6 billion people all together (Ratcliff, 2017[5]). Income inequalities also tend to be higher in large cities, raising the possibility that compact cities may benefit some residents, will disadvantaging others (OECD, 2016[6]).

In 2014, there is almost a USD 40,000 gap between OECD countries and the low-income countries. Whereas between the middle-income and low-income countries, there is a gap of ten times less, USD 4,000.

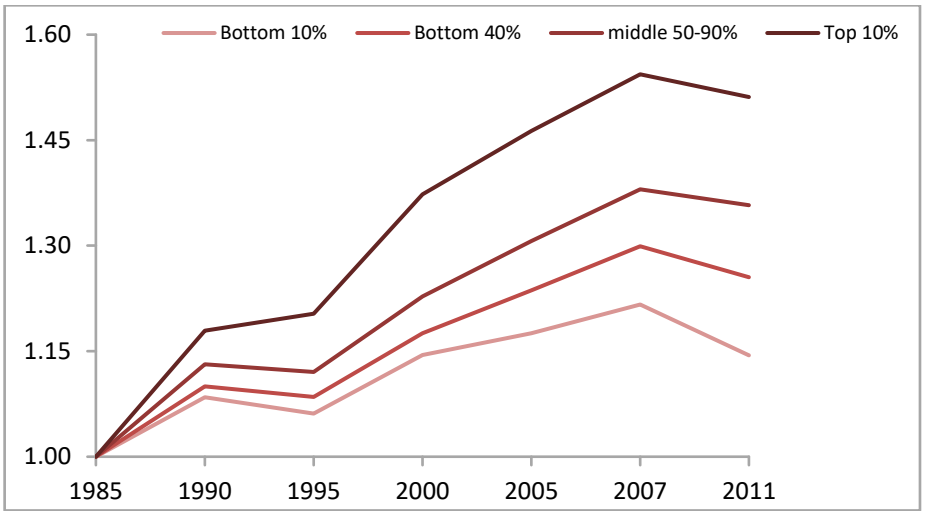
Relative poverty is increasing in many OECD countries, which can have dangerous consequences.

Relative poverty is the condition in which people lack the minimum amount of income needed in order to maintain the average standard of living in the society in which they live (OECD, 2015[7]). In many OECD countries relative poverty is on the rise, creating greater inequality and uncertainty for large parts of the population.

According to data from 2011, although general trends in real household incomes are declining, the gap between the bottom 10% and top 10% gets wider.

Figure 8. The gap between highest and lowest incomes are getting increasingly wider

Trends in real household incomes at the bottom, the middle and the top quartiles, OECD average, 1985-2011



Note: Income refers to disposable household income, corrected for household size. OECD is the unweighted average of 17 countries (Canada, Germany, Denmark, Finland, France, United Kingdom, Greece, Israel, Italy, Japan, Luxembourg, Mexico, Netherlands, Norway, New Zealand, Sweden and United States). Information on data for Israel: http://dx.doi.org/10.1787/888932315602.
Source: OECD (2015), In It Together – Why Less Inequality Benefits All, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264235120-en

If such income inequality keeps growing, dangerous consequences can occur. The world's poorest population will get poorer and governments will have to provide social securities in order to avoid political or civil conflicts. If countries transform their structures and policies to enable inclusive economic growth, they will not only experience more substantial growth but will also have much more income flowing in the economy to secure the public.

Note to readers: implications for education will be added / elaborated.

Housing: living in a secured place with decent conditions is getting harder and harder.

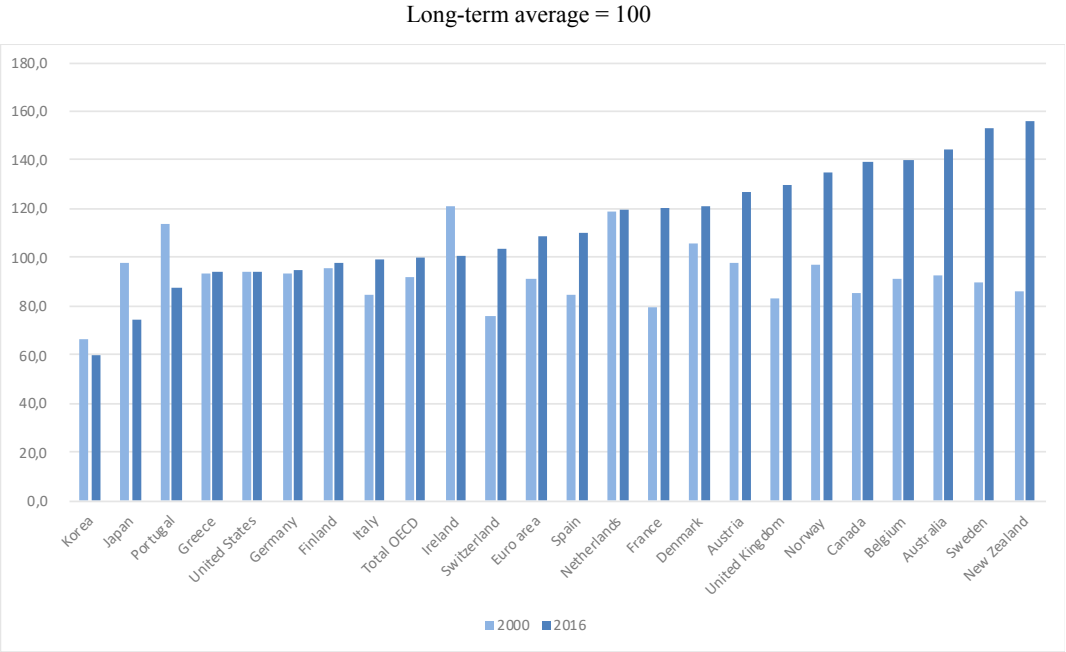
Securing a place to live has a direct impact on well-being. This is a basic need that goes beyond having a roof and four walls, it must be a place where people can rest, feel safe, have personal space and are able to raise a family.

The house price-to-income ratio raises in many OECD countries.

House prices have grown faster than incomes in many countries. In other words, it has become more and more difficult to become a home owner. As a renter, it is almost impossible to plan ahead and moving places is very often the only solution, which creates a great deal of uncertainty (Bullard and Pierre-Louis, 2017[8]). This is supported by recent

data suggesting an increase in the house price-to-income ratio of most OECD countries and the ratio almost doubled in New Zealand from 2000 to 2016.

Figure 9. House price-to-income ratio in 2000 and 2016



Source: (OECD Stat, 2018[9])

The next generations need to prepare for the rise of Megacities.

The majority of the world's population now lives in urban areas, and urbanization is expected to increase in coming years. In 1970, 36% of people in the world lived in cities and, in a bit less than a century, 70% of the world population is expected to live in urban areas. The impact of this increase can be consequential if the future generations and cities are not well prepared to receive and accommodate 6.4 billion people (IOM, 2015[10]).

Figure 10. More and more people live in cities

Percentage of the world population living in urban areas

Source: OECD (2016), OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris. http://dx.doi.org/10.1787/sti_in_outlook-2016-en

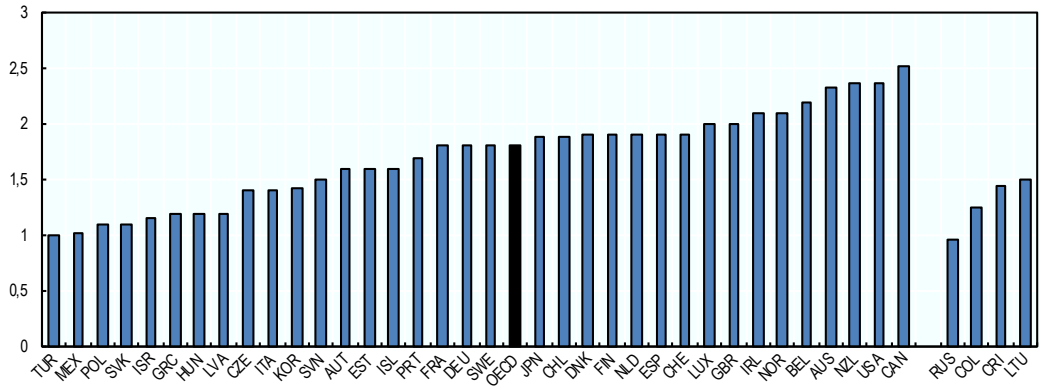
Each person has at least one room and the majority of the world population has dwellings with basic facilities.

When looking at housing, it is important to examine living conditions, such as the average number of rooms shared per person and whether dwellings have access to basic facilities. The number of rooms in a dwelling, divided by the number of people living there, indicates whether residents are living in crowded conditions. Overcrowded housing may have a negative impact on physical and mental health, relations with others, and children's development (Better Life Index, 2018[11]).

This survey shows that all OECD countries have at least one room per person, such as in Turkey and Mexico, and almost a third of the countries own two rooms or more per person. For example, people living in Canada, USA, New Zealand and Australia own about 2.5 rooms per person.

Figure 11. Rooms per person

Average number, 2015 or latest available year

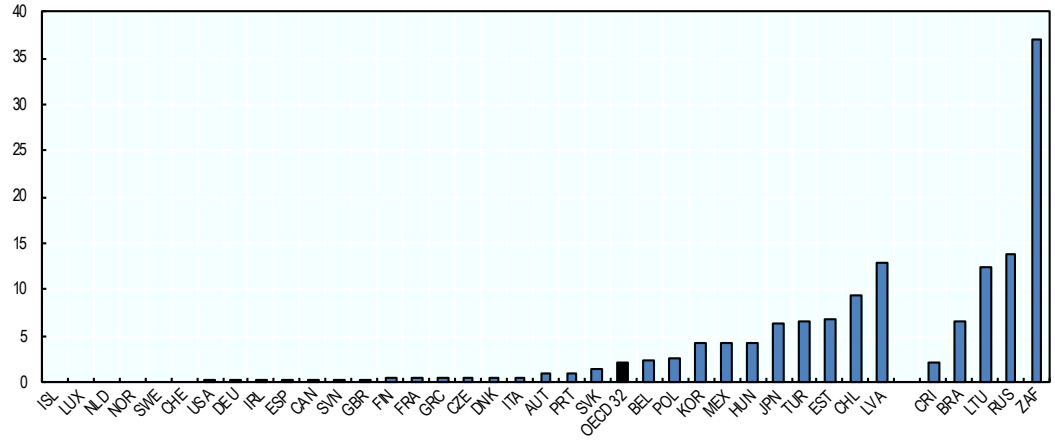


Note: The latest available year is 2016 for Colombia, Costa Rica, Finland, Hungary, Latvia and Lithuania; 2014 for Israel and Switzerland; 2013 for Japan, New Zealand, Turkey; 2011 for Australia, Canada; and 2010 for Korea. Values for Australia, Canada, Chile, Israel, Mexico, New Zealand and the United States are OECD calculations based on national data. The OECD average is population-weighted.
Sources: European Union Statistics on Income and Living Conditions (EU-SILC), http://ec.europa.eu/eurostat/web/incomeand-living-conditions/overview for EU countries, Norway, Switzerland and Turkey; ABS Census of Population and Housing for Australia; Canadian National Household Survey for Canada; INE Censo for Chile; Labour Force Survey (GEIH) for Colombia; Household and Multiple Purpose Survey of Costa Rica for data before 2010 and National Household Survey from 2010; Israeli Household Expenditure Survey for Israel; Housing and Land Survey of Japan for Japan; Population and Housing Census of Korea for Korea; INEGI Censo de Población y Vivienda and Encuesta Intercensal 2015 for Mexico; Census of New Zealand for New Zealand; ROSSTAT Income, Expenditure and Consumption of Households statistical report for the Russian Federation Population; and American Community Survey for the United States.

Besides this, dense living conditions are often a sign of inadequate water and sewage supply. In terms of basic facilities, 97.9% of people across the OECD live in dwellings with private access to an indoor flushing toilet (Better Life Index, 2018[11]).

Figure 12. Dwellings without basic sanitary facilities

Percentage of people living in dwellings without an indoor flushing toilet for the sole use of their household, 2015 or latest available year



Note: The latest available year is 2016 for Costa Rica, Finland, Hungary, Latvia, Lithuania and South Africa; 2014 for the Russian Federation; 2013 for the United States; 2010 for Korea and Mexico; 2001 for Chile; and 1997 for Canada. The OECD average is population-weighted and excludes Australia, Israel and New Zealand
Sources: European Union Statistics on Income and Living Conditions (EU-SILC) http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc for EU countries, Norway and Switzerland; Universo do Censo Demográfico 2010 of Brazil; Canadian Household Facilities and Equipment Survey for Canada; INE Censo 2002 for Chile; Household and Multiple Purpose Survey of Costa Rica for data before 2010 and National Household Survey from 2010 for Costa Rica; Housing and Land Survey for Japan; Population and Housing Census for Korea; INEGI Censo de Población y Vivienda 2010 for Mexico; ROSSTAT Income, Expenditure and Consumption of Households statistical report for the Russian Federation; Turkish Income and Living Conditions survey for Turkey; and American Housing Survey for the United States.

Note to readers: implications for education will be added / elaborated.

Work-Life Balance: although people spend more and more time at work, they still value quality leisure time.

Finding an appropriate division between professional and personal life highly contributes not only to the well-being of an individual but also to the well-being of an entire household.

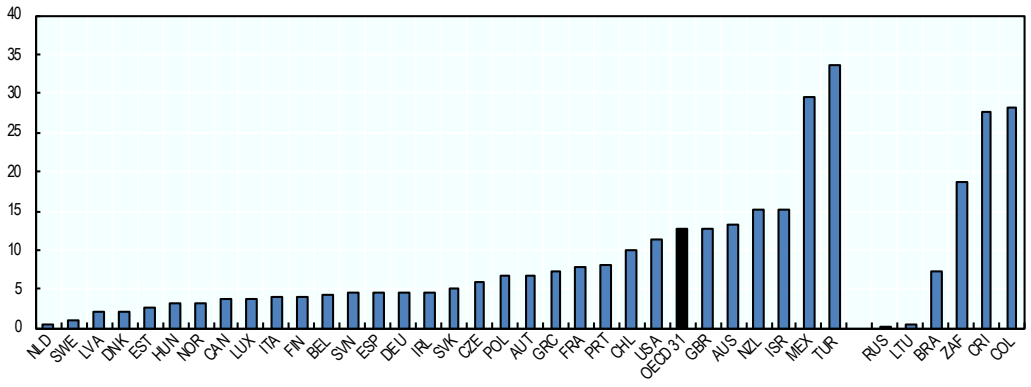
Employees work long hours, and men generally work longer hours than women

An important aspect of work-life balance is the amount of time a person spends at work. Evidence suggests that long work hours may impair personal health, jeopardise safety and increase stress. 1 in every 8 employees in the OECD works 50 hours or more per week (Better Life Index, 2018[12]).

Turkey is by far the country with the highest proportion of people working very long hours, with 34%, followed by Mexico with nearly 30% and Israel and New Zealand both with 15% of employees. Overall, more men work very long hours; the percentage of male employees working very long hours across OECD countries is over 16%, compared with nearly 8% for women (Better Life Index, 2018[12]).

Figure 13. Employees working very long hours

Percentage of employees usually working 50 hours or more per week, 2016 or latest available year



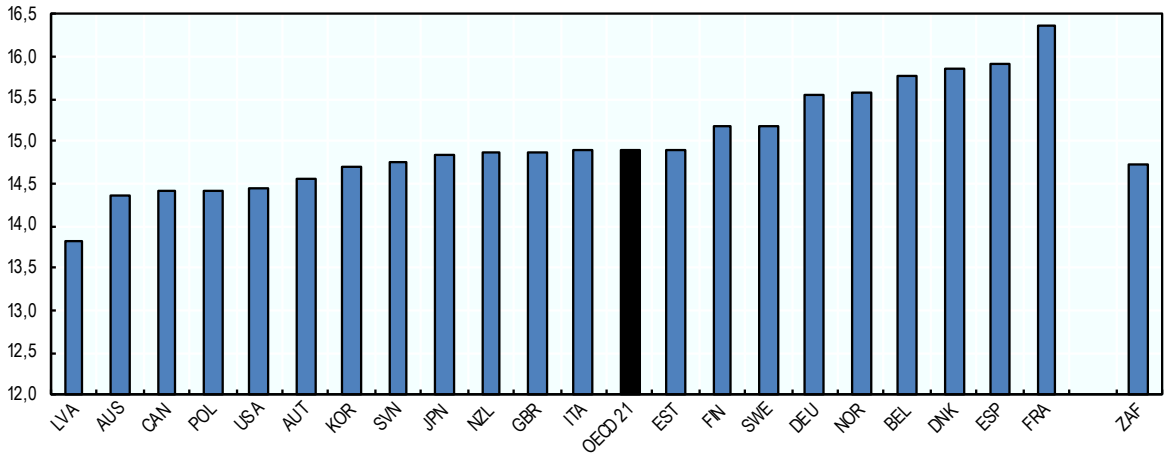
Note: Data refer to the percentage of all employees usually working 50 hours or more per week, except for the Russian Federation for which data refer to people who worked 51 hours or more. The jobs covered are the main job for Canada, Chile, Colombia, Costa Rica, the Czech Republic, Finland, Hungary, Latvia, Mexico, Portugal, the Slovak Republic, Sweden and Turkey; and all jobs for all the other countries. Employees whose weekly usual hours worked vary from one week to another are excluded. Extra hours worked are not included in Canada, Chile, Hungary and Norway if they are not contractual; while they are included only if regular in Australia, Mexico, New Zealand, the Russian Federation, Sweden, Switzerland, Turkey and the United States. The main meal break is excluded for Austria, Belgium, Denmark, Estonia, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, the Slovak Republic, Slovenia, Spain and the United Kingdom. Details are not available for Brazil. The latest available year is 2015 for Brazil. The OECD average is population weighted and excludes Iceland, Japan, Korea and Switzerland.
Source: OECD calculations based on "Labour Force Statistics", OECD Employment and Labour Market Statistics (database), http://dx.doi.org/10.1787/lfs-lfs-data-en.

Time devoted to leisure and personal care is on average about 15 hours

The amount and quality of leisure time is important for people's overall well-being and can bring additional physical and mental health benefits. A full-time worker in the OECD devotes 62% of the day on average, or close to 15 hours, to personal care (eating, sleeping, etc.) and leisure (socialising with friends and family, hobbies, games, computer and television use, etc.) (Better Life Index, 2018[12]).

Figure 14. Time devoted to leisure and personal care

Hours per day, people in full-time employment, latest available year



Note: Data refer to 2016 for the United States; 2014-15 for the United Kingdom; 2011 for Japan; 2010 for Canada, Norway and South Africa; 2009-10 for Estonia, Finland, France, New Zealand, Spain; 2009 for Korea; 2008-09 for Austria and Italy; 2006 for Australia; 2005 for Belgium; 2003-04 for Poland; 2001-02 for Germany; 2001 for Denmark; and 2000-01 for Slovenia and Sweden. Data have been normalised to 1440 minutes per day: in other words, for those countries for which the time use did not sum up to 1440 minutes, the missing or extra minutes (around 30-40 minutes usually) were proportionally distributed across all activities. Data for Hungary, Ireland, Portugal, Turkey and South Africa were excluded as they also include part-time workers. Survey samples include people aged 12 or more in New Zealand; 15 or more in Austria, Canada, Denmark, Finland, France, Italy, Japan, Spain and the United States; 20 to 74 years old in Belgium, Germany, Norway, Poland, Slovenia, Sweden; and 20 or more in Korea. As there is no specific question in the survey to identify full-time employed people in Canada, Japan, Korea and the United States, they have been defined on the basis of the minimum number of hours worked per week, which is set at 30, 35, 36 and 35 respectively. The OECD average is population-weighted; it excludes Chile, the Czech Republic, Greece, Hungary, Iceland, Ireland, Israel, Luxembourg, Mexico, the Netherlands, Portugal, the Slovak Republic, Switzerland and Turkey.
Source: OECD calculations based on the Harmonised European Time Use Survey web application for European countries (www.tus.scb.se); Eurostat database, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=tus_00selfstat&lang=en; and public-use time use survey micro-data and tabulations from National Statistical Offices for non-European countries.

Note to readers: implications for education will be added / elaborated.

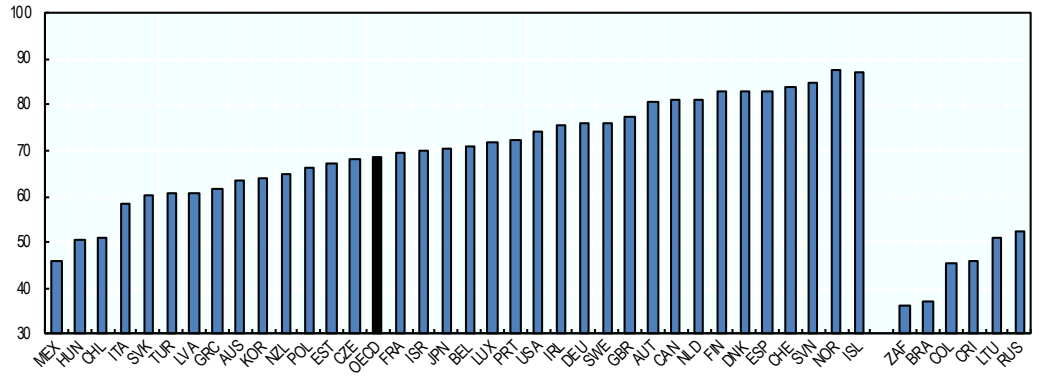
Safety: threats such as safety walking at night or terrorism, as well as emerging threats such as cyber-bullying both make the world more VUCA.

Personal security is a core element for the well-being of individuals, and includes the risks of people being physically assaulted or falling victim to other types of crime. Crime may lead to loss of life and property, as well as physical pain, post-traumatic stress and anxiety. One of the biggest impacts of crime on people's well-being appears to be through the feeling of vulnerability that it causes (Better Index Life, 2018[13]).

The feeling of safety walking home at night is about 70% in average in OECD countries.

Safety and crime rates in a society reflect to what extent people feel that their freedom of movement and their property are protected. A high level of personal safety can promote openness, social contact and cohesion. Feeling safe while walking alone at night is generally strong, with more than 85%, in the Nordic countries such as Norway and Iceland, but also in Switzerland and Slovenia where similar levels have been recorded. However, Chili and Hungary are slightly above 50%, followed by Brazil with 46%. The OECD average is about 69% and Czech Republic is the closest to it.

Figure 15. Feelings of safety when walking alone at night



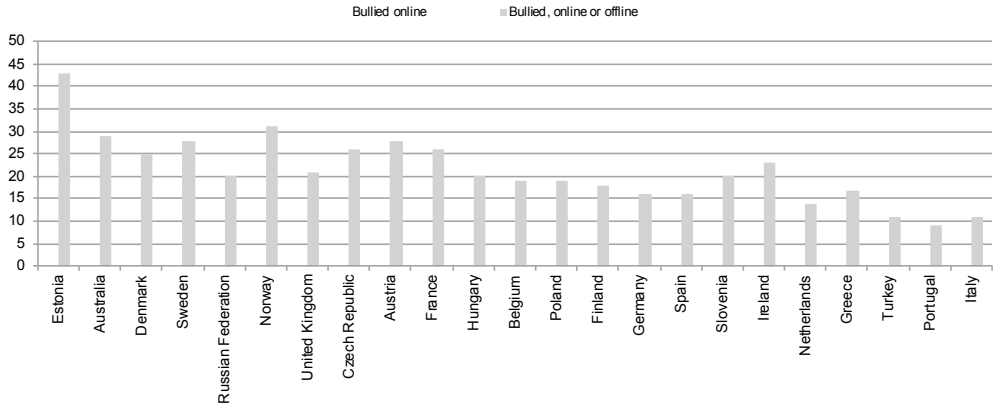
Note: The OECD average is population-weighted.
Source: OECD calculations based on Gallup World Poll, www.gallup.com/services/170945/world-poll.aspx.

Cyber-bullying is an emerging and troubling challenge

Today's students are exposed to new dangers of a global online world. In 2010, more than 10% of children reported to have been bullied online in Estonia, Australia, Denmark, Sweden and Russian Federation. This tendency of online bullying leads to greater volatility and requires reflection on how our societies handle online security and protection. Due to the rapid growth of technology, many security concerns have been raised. The likelihood of technology related security trends emerging in the near future is very high.

Figure 16. Cyber bullying: An emerging and troubling challenge

Percentage of children surveyed reporting being bullied online and offline, in 2010

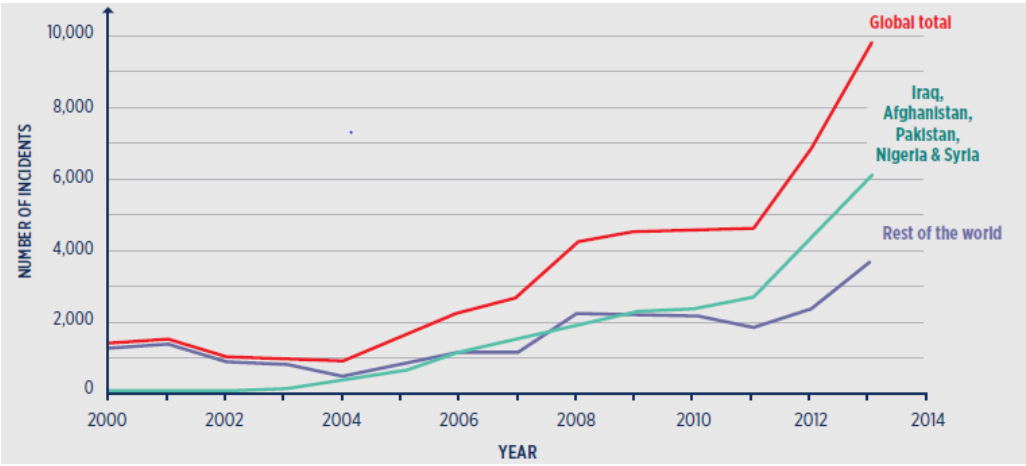


Source: Livingstone, S., L. Haddon, A. Görzig, and K. Ólafsson (2011), EU Kids Online September 2011, London School of Economics and Policial Science, co-funded by the European Union.

Global increase of terrorist incidents

In 2013, 60 per cent of all terrorist attacks occurred in five countries; Iraq, Afghanistan, Pakistan, Nigeria and Syria. However the rest of the world suffered a 54 per cent increase in terrorist incidents in 2013.

Figure 17. Global terrorist incidents increase overtime



Source: Global Terrorism Index, 2014

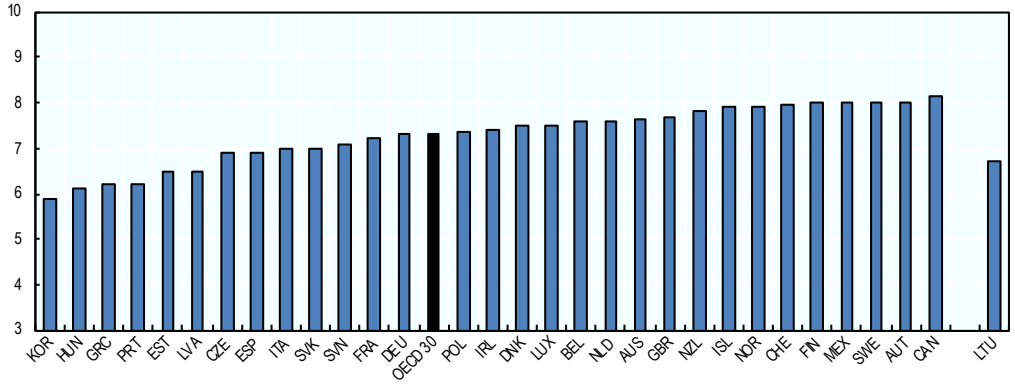
Note to readers: implications for education will be added / elaborated.

Life satisfaction: the advancement of technology contributes to life satisfaction.

Life satisfaction measures how people evaluate their life as a whole rather than their current feelings (Better Life Index, 2018[14]). People across OECD countries were asked to rate their life satisfaction from 0 to 10. Although the average is at 7.3, the results are relatively spread. Countries such as Korea, Hungary, Greece and Portugal gave a rating as low as 6. Whereas Finland, Mexico, Sweden, Austria and Canada's scores were at 8 out 10.

Figure 18. Life satisfaction

Mean values on a 0-10 scale, 2013 or latest available year



Note: Data refer to 2016 for Austria, Hungary, Italy, Korea, the Netherlands, New Zealand, Slovenia and the United Kingdom; to 2015 for Canada, Denmark, France, Poland and Switzerland; and to 2014 for Australia and Mexico. The OECD average is population-weighted and excludes Chile, Israel, Japan, Turkey and the United States.

Source: European Union Statistics on Income and Living Conditions (EU-SILC), http://ec.europa.eu/eurostat/web/incomeand-living-conditions/overview for EU countries, except for Austria, Hungary, Poland, Slovenia and Switzerland for which the National SILC is considered and except for Denmark, France, Italy for which the national social survey is considered, due to an higher survey frequency; Australian Bureau of Statistics, 2014 General Social Survey, www.abs.gov.au/ausstats/abs@.nsf/mf/4159.0#Anchor3 for Australia; Statistics Canada, 2015 Community Health Survey (CCHS) for Canada; Danmark Statistik, Danish Quality of Life Survey 2015 for Denmark; INSEE, Statistiques sur les resources et conditions de vie, https://www.insee.fr/fr/metadonnees/source/s1220#consulter for France; ISTAT, Multipurpose survey on households 2016 for Italy; Korean Institute of Public Administration, 2016 Korea Social Integration Survey for Korea; INEGI, the National Survey of Household Expenditure (BIARE-ENGASTO) 2014, www.inegi.org.mx/inegi/contenidos/investigacion/Experimentales/Bienestar/default.aspx for Mexico; Statistics Netherlands, 2016 Survey on social cohesion and wellbeing for the Netherlands; Statistics New Zealand, 2016 General Social Survey, www.stats.govt.nz/browse_for_stats/people_and_communities/Households/nzgss_HOTP2014/Tables.aspx for New Zealand; and ONS Annual Population Survey 2016 for the United Kingdom.

The shared economy is seen as contributing to people's life satisfaction because, while money may not buy happiness, this new system introduces experiences at a more affordable price. This enables low and middle-income families to have better access to goods and services (OECD, 2011[15]). Similarly, inclusive growth is also an important factor to fulfilment of life. When a country experience inclusive growth, the overall well-being of it entire population will positively increase.

While technology advances impact positively on life satisfaction, where laborious work is being digitalised and operating much faster and more efficiently, other emerging trends

such as big data make people feel insecure about the access to data about them, which deeply affects their online experience and thus their life satisfaction.

Note to readers: implications for education will be added / elaborated.

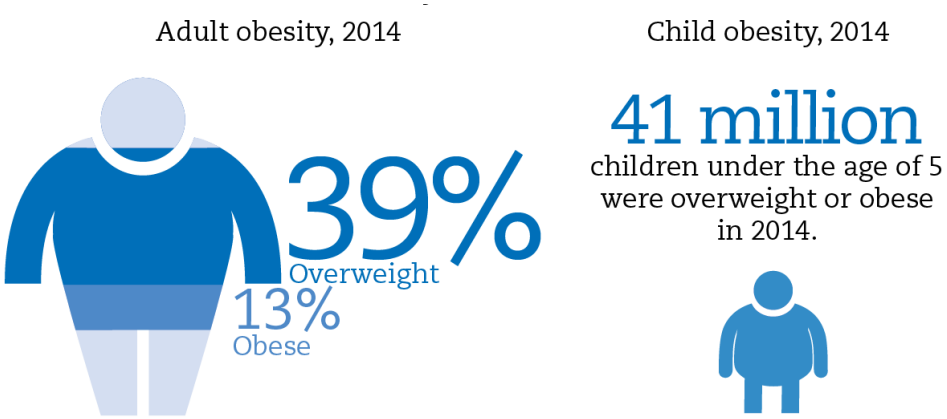
Health: although children's health is affected by obesity, teenage suicide rate has decreased.

Good health is an essential condition for a person to carry on with life. This gives access to education, the job market and social activities, increases productivity and decreases healthcare cost, which all together impact on one's well-being.

Obesity among children is on the rise

Demography and lifestyle changes have profound effects on people's **health**. Excessive weight problems in childhood are associated with an increased risk of being obese as an adult, at which point cardiovascular disease, diabetes, certain forms of cancer, osteoarthritis, a reduced quality of life and premature death become health concerns. The World Health Organisation (WHO) reported that worldwide obesity has tripled since 1975. In children between 5 and 19 years old, 4% were overweight or obese in 1975, whereas 18% of them are overweight or obese in 2016. (World Health Organisation, 2016[16]). The number has nearly quintupled. In the world, 41 million children under the age of 5 were overweight or obese in 2014.

Figure 19. Obesity on the rise

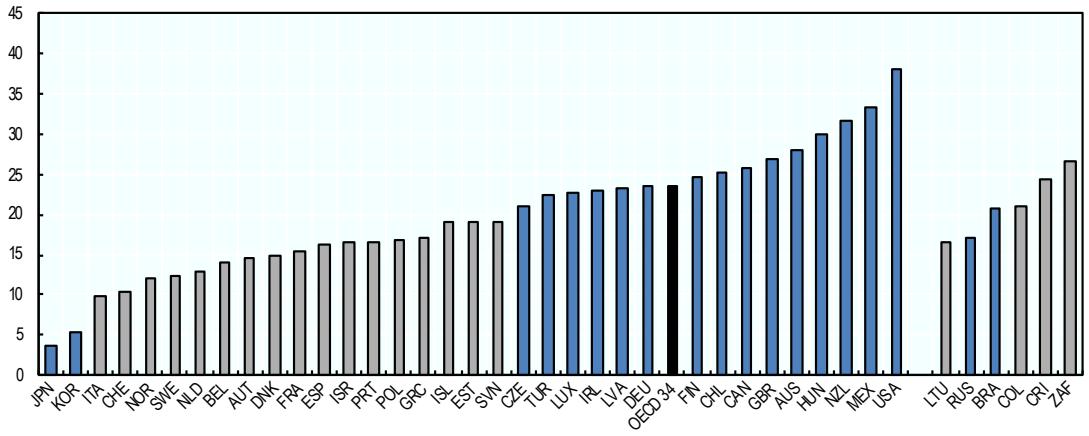


Source: OECD (2016), OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris. http://dx.doi.org/10.1787/sti_in_outlook-2016-en

Evidence suggests that people are now more at risk from obesity than starvation in both low and high-income countries (Hannon, 2017[17]). According to recent data, 24% of the OECD countries' population from 15 years-old suffer from obesity in average. The range goes from Japan and Korea with about 5% or less to the USA with 38% of its adult population being obese.

Figure 20. Obesity prevalence

Percentage of the population aged 15 and older, 2016 or latest available year



Source: STEVENS, Gretchen et al (2012), "National, regional and global trends in adult overweight and obesity prevalences", Population Health Metrics 2012, 10:22

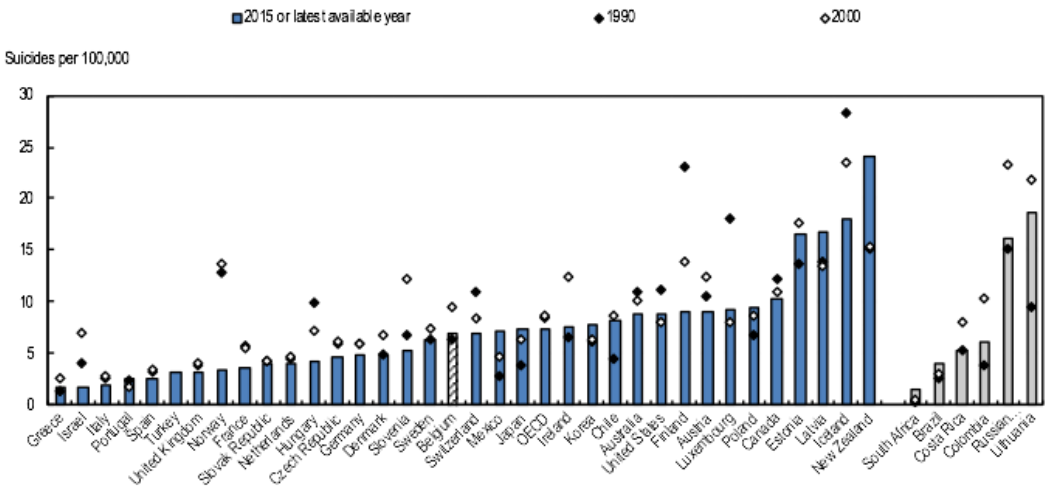
Teenage suicide rate is declining in most OECD countries

Teenage suicide rates are calculated as the total number of deaths due to 'intentional self-harm' among the population aged 15-19 years old in a given year, divided by the total population of 15-19 years old that year, and multiplied by a factor of 100 000. The result is expressed in units of suicides per 100 000 individuals (aged 15-19) per year.

Data show that teenage suicide has decreased over time in most countries, such as Finland, Iceland, Norway, but has almost doubled from 1990-2000 to 2015 in New Zealand.

Figure 21. Teenage suicides, 1990a, 2000b and 2015c or latest available year

Suicides by people aged 15-19 per 100,000 people aged 15-19



Source: WHO (2017). WHO Mortality Database.

Note to readers: implications for education will be added / elaborated.

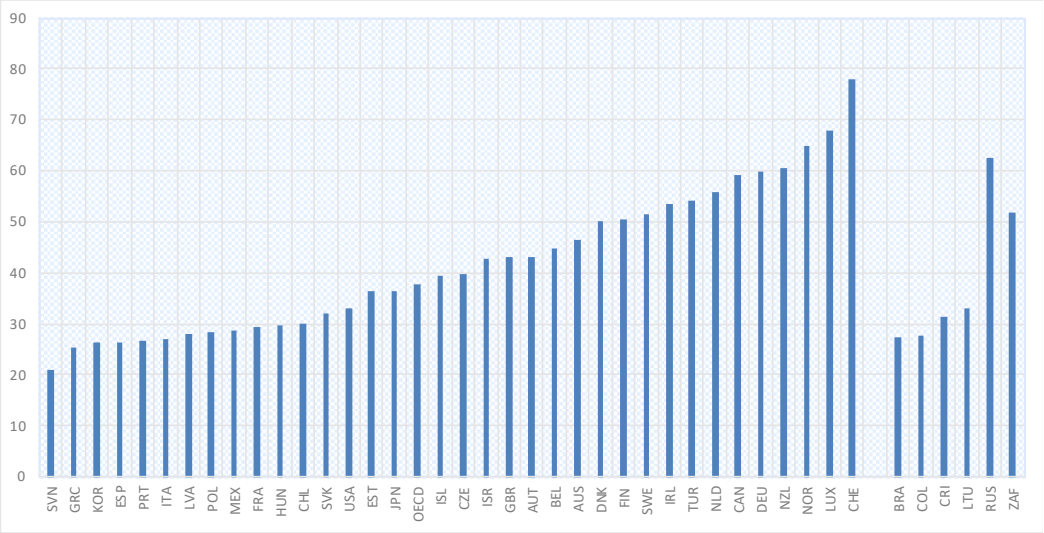
Civic engagement: there is low confidence in national governments

Trust in government is essential for social cohesion and well-being. Today, more than ever, citizens demand greater transparency from their governments. Information on the who, why and how of decision making is essential to hold government to account, maintain confidence in public institutions and support a level playing field for business. Greater transparency is not only key to upholding integrity in the public sector; it also contributes to better governance. Indeed, openness and transparency can ultimately improve public services by minimising the risk of fraud, corruption and mismanagement of public funds (Better Life Index, 2018[18]).

There is a general decrease in levels of confidence in national government after the financial crisis and large differences between countries. The loss of trust matters because it leads to reduced compliance with laws and increased risk aversion (International IDEA, 2016[19]). In most of the OECD countries, half of the population answered negatively to the question about confidence in their national government. The OECD average drops below 40%.

Figure 22. Trust in the national government is declining

Proportion of the population responding "yes" to a question about confidence in the national government



Note: The OECD average is population-weighted; its times series excludes Iceland and Luxembourg for all other years, due to incomplete time series for these countries. For the latest available year, the OECD average considers all OECD countries.
Source: OECD calculations based on Gallup World Poll, www.gallup.com/services/170945/world-poll.aspx.

Environment: water quality, air pollution and biodiversity have emerged as relevant challenges.

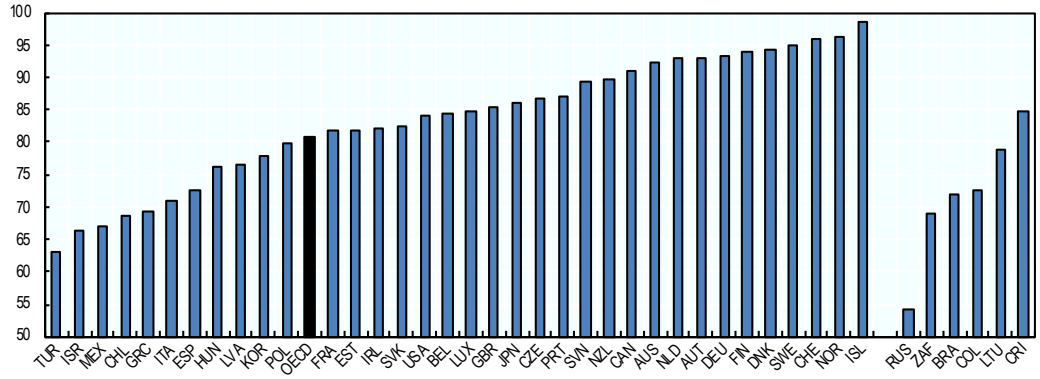
The quality of local living environments has a direct impact on our health and well-being. An unspoiled environment is a source of satisfaction, improves mental well-being, allows people to recover from the stress of everyday life and to perform physical activity. Having access to green spaces for example, is an essential part of quality of life. Also, our economies rely not only on healthy and productive workers but also on natural resources such as water, timber, fisheries, plants and crops. Protecting the environment and natural resources therefore remains a long-term priority for both the current and future generation (Better Life Index, 2018[20]).

Maintaining water quality is becoming an issue

Access to clean water is fundamental to human well-being. Managing water to meet that need is a major – and growing – challenge in many parts of the world. Many people are suffering from inadequate quantity and quality of water. Despite significant progress in OECD countries in reducing water pollution, from fixed sources such as industrial and municipal wastewater treatment plants, diffuse pollution from agriculture and urban run-offs remains a challenge, and improvements in freshwater quality are not always easy to discern. On average, almost 81% of people in OECD countries say they are satisfied with water quality (Better Life Index, 2018[20]).

Figure 23. Satisfaction with water quality

Percentage of satisfied people in the overall population, 2014-16 average



Note: The OECD average is population-weighted.
Source: OECD calculations based on Gallup World Poll, www.gallup.com/services/170945/world-poll.aspx.

Air pollution becomes difficult to regulate

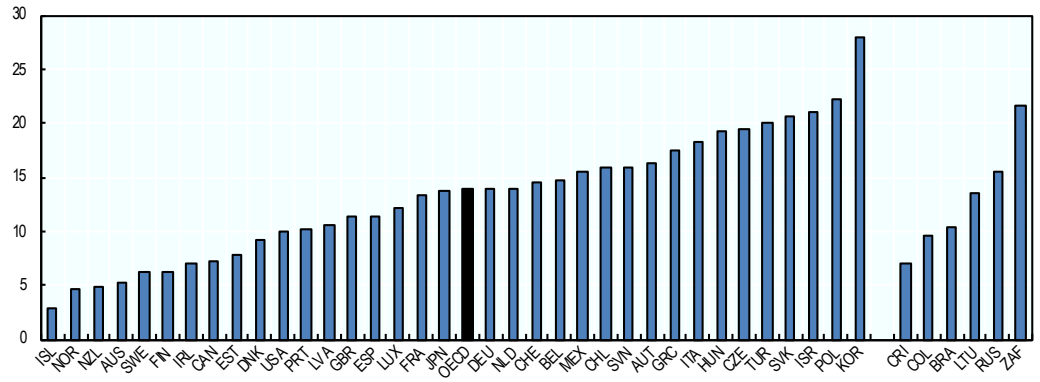
Outdoor air pollution is one important environmental issue that directly affects the quality of people's lives. Despite national and international interventions and decreases in major pollutant emissions, globally the health impacts of urban air pollution continue to worsen, with air pollution set to become the top environmental cause of premature mortality by 2050. Air pollution in urban centres, often caused by transport and the use of small-scale burning of wood or coal, is linked to a range of health problems, from minor eye irritation to upper respiratory symptoms in the short term and chronic respiratory diseases such as asthma, cardiovascular diseases and lung cancer in the long term. Some of these complications require hospital treatment, and may be fatal. Children and the elderly may be particularly vulnerable (Better Life Index, 2018[20]).

PM2.5 – tiny particulate matter small enough to be inhaled into the deepest part of the lung – is monitored in OECD countries because it can harm human health and reduce life expectancy. In several OECD countries the share of the population exposed to PM2.5 has dropped. However, in about half of the countries, more than 90% of the population is still exposed to concentrations above the World Health Organization guideline limit of 10 micrograms per cubic meter (Better Life Index, 2018[20]).

On average, PM2.5 concentrations are at around 13.9 micrograms per cubic meter in OECD countries. The OECD Environmental Outlook to 2050 projects the number of premature deaths associated with exposure to PM10 and PM2.5 to increase from just over 1 million worldwide in 2000 to about 3.5 million in 2050.

Figure 24. Population exposure to outdoor air pollution by fine particulate matter (PM2.5)

Population-weighted exposure to PM2.5 concentrations, micrograms per cubic metre, 3-year moving average, 2013



Note: The 2013 moving averages are interpolated from 2012, 2013 and 2015, as estimates for 2014 are not available. The OECD average is population-weighted.
Source: OECD calculations based on OECD Exposure to air pollution (database), http://dotstat.oecd.org/Index.aspx?DataSetCode=EXP_PM2_5.

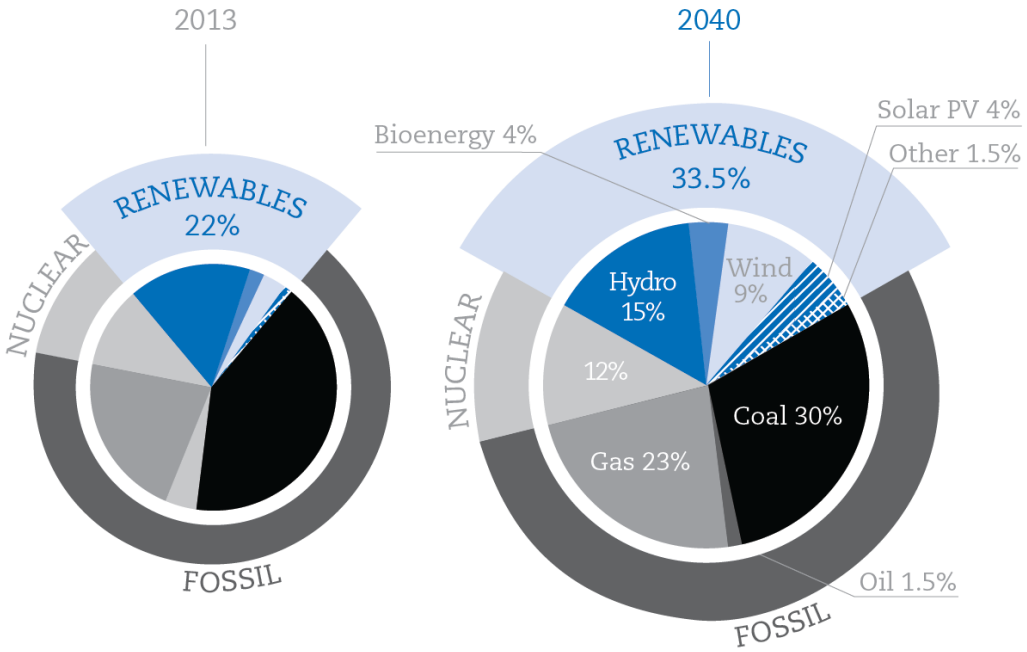
Energy supply will be mainly relaying on wind and solar energy.

Growing population coupled with economic growth will place a considerable burden on natural resources. Severe water and air quality stress are likely in many parts of the world, energy consumption will not only rise, but also shift to other means, which will contribute to further climate change.

The OECD STI report estimates that energy supply will be composed of 33.5% of renewable energy, including a growing use of wind and solar energy by 2040. Onshore wind and solar photovoltaics are ready to be mainstreamed, but high levels of deployment will require further innovation in energy storage and smart grid infrastructure to increase their adaptability to weather variability (OECD, 2016[21]).

Figure 25. New markets for renewables

Energy supply mix (% of electricity generation)



Source: OECD (2016), OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris. http://dx.doi.org/10.1787/sti_in_outlook-2016-en

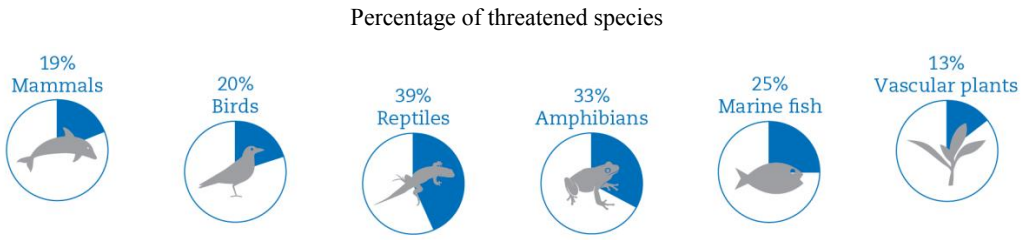
Global biodiversity is threatened

Global biodiversity will come under increasing threat, especially in densely populated poorer countries. Studies suggest that 60% of the world's biocapacity is held by only ten countries that suffer most from heavy land and forest degradation and 10% of terrestrial biodiversity loss by 2050 are concentrated in Asia, Europe, and southern Africa (OECD, 2016[21]).

The challenge exists because biodiversity is linked to economic activities. Thus, to ensure that economic development is sustainable, it will require satisfying human needs and wants in such a way that valuable biodiversity and ecosystem functions are not lost, in particular as many of these ecosystem functions (OECD, 2008[22]).

Recent data show that 39% of reptiles, followed by 33% of amphibians and 25% of marine fishes are considered as threatened species.

Figure 26. OECD biodiversity is at threat



Source: OECD (2016), OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris. http://dx.doi.org/10.1787/sti_in_outlook-2016-en

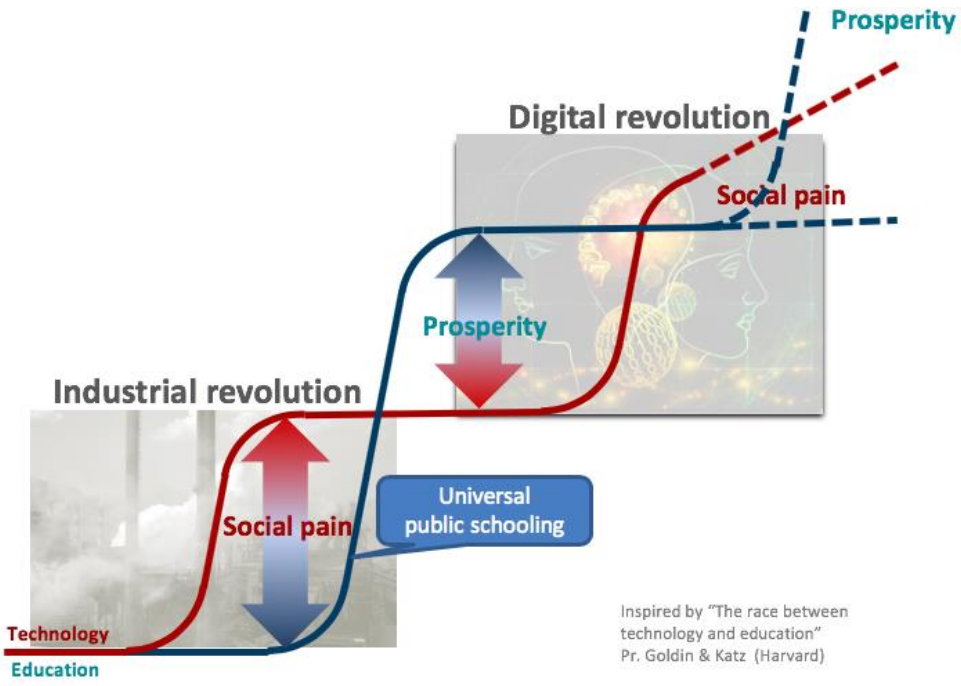
Note to readers: implications for education will be added / elaborated.

Education: advancement of technology creates important changes in education

Education is key to well-being as it provides knowledge, skills, attitudes and values to enable future generations to thrive in the fast-changing society. A well-educated person will be able to better overcome challenges, secure a job, participate in society more effectively, commit fewer crime and less likely to rely on social assistance.

The race between technology and education gets increasingly tougher

Figure 27. The race between technology and education



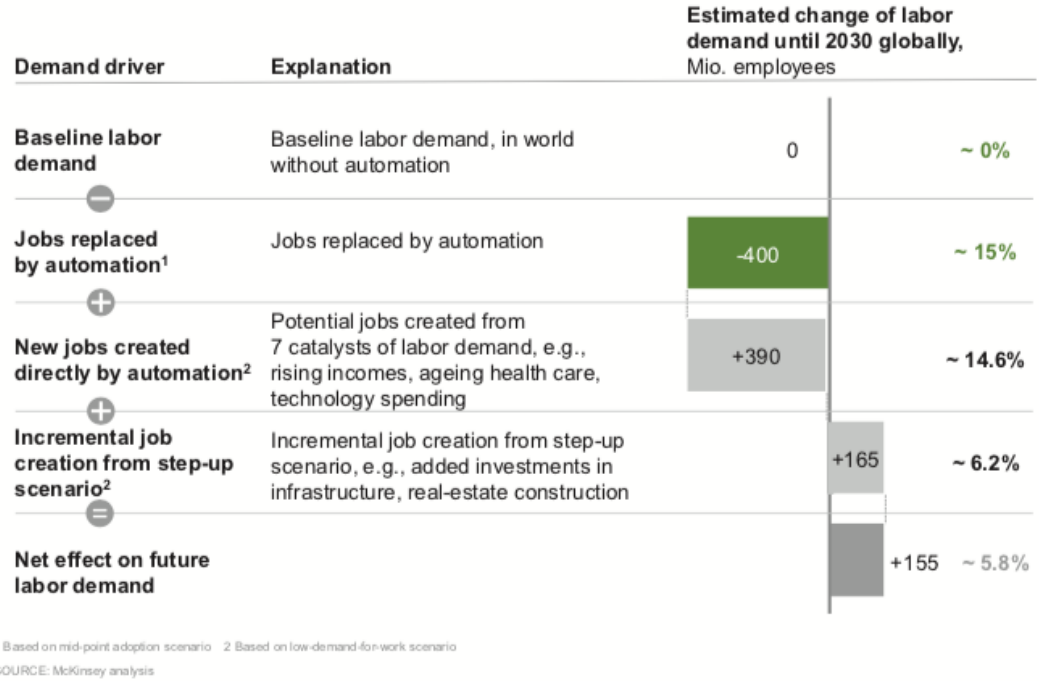
After recovering from 2008's financial crisis, more and more countries start investing in social services such as education (OECD, 2017[23]). The funding will mainly help to fight the social pain caused by the growing gap between technology advancement and school curriculums. The digital revolution is currently happening faster than schools can align their education programmes to. In other words, educators have limited time to re-shape their school curriculums that they need to readjust again.

However, technology and education can also go hand in hand together. Technological innovation creates more and more opportunities for improvement, teaching and learning environments become more efficient and enjoyable.

Skills gap is more and more obvious as many job will disappear and new jobs will emerge

Within 20 years, technology improvements will enable half of the current jobs to be automated. According to a study led by McKinsey Global Institute, 15% of jobs performed by humans can be automated with the technology currently known. Then, the remaining 35% will also be automated, but this will take longer time as it will need people with new skills to fit new jobs. This means that many jobs will disappear, but more jobs will be created due to a better productivity (McKinsey Global Institute, 2017[24]).

Figure 28. Estimated change of Labour demand



Note: While many jobs will become obsolete, automation and the resulting increase in productivity will create new jobs
Source: (Ashoka Germany and McKinsey & Company, Inc., 2018[25])

Although more jobs will be available on the labour market, many employers are concerned with the skills gap between the old and new jobs. McKinsey's latest report "Future of Organizations and Work" determines that 3 to 14% of the global workers, which is equivalent to 75 to 275 million people, will have to change professions. For example, Germany will see 32% of their workforce change professions by 2030 (McKinsey Global Institute, 2017[26]).

Note to readers: implications for education will be added / elaborated.

Community gets more diverse

Having satisfactory quantity and quality relationships with surrounding people is a fundamental point for well-being. Studies show that time spent with friends is associated with a higher average level of positive feelings and a lower average level of negative feelings than time spent in other ways (Better Life Index, 2018[27]).

The changes in immigration impact our communities, which are becoming more diverse and multicultural. Classrooms are becoming more ethnically, culturally, and linguistically diverse. However, increased diversity in the classroom poses a question about language instruction and effective integration of all students into the school community.

The results from the OECD Survey of Adult Skills (PIAAC), which measures adults' proficiency in different areas (literacy, numeracy and problem-solving in technology-rich environments) show that foreign-born people whose first or second language is not the same as the language of the assessment have lower literacy scores than the native-born in every country. By contrast, migrants who speak the native language of the host country (i.e. as a first or second language) sometimes perform as well as (or even better than) native-born, native-tongue speakers, as seen in the Flanders region of Belgium, Austria, Greece, England, Ireland and New Zealand (OECD, 2017[23]).

Note to readers: implications for education will be added / elaborated.

Demand Analysis: knowledge, skills, attitudes and values are no longer the same for 2030 as they are today.

Due to the fast-changing society and megatrends among the 11 indicators of well-being, education needs to adapt accordingly in order to prepare future generations with the most appropriate skills to the future work place. Future generations are now expected to be equipped with new competencies, knowledge, skills, attitudes and values to lead a successful life and contribute to a well-functioning society.

Students present different needs, focus and interests depending on different stages of their development and education, which go from fun to social-emotional skills.

Their approach into developing an understanding and engaging with an increasingly volatile, uncertain, complex and ambiguous society changes from primary education, lower secondary education, upper secondary education and post-secondary education.

In primary and lower secondary education, students value social, variety of knowledge, fun and practical knowledge

In primary education and lower secondary education, students do not have specific subjects or classes in which they are particularly interested in developing. They mostly describe school and classes as social, variety, fun and practical (Li, 2016[28]).

Students from a young age classify group work and collaboration as an enjoyable skill to have. Interaction with people increases happiness. Getting along or being able to work with others, especially with those from different or diverse backgrounds is a recurring theme in many countries (Children's Rights Alliance for England, 2008[29]). Therefore, students in primary education value socialising and collaborating with others.

Students at this education stage also seek for a variety of knowledge and fun. They prefer learning about different subjects and avoid routines because they find learning "more fun" and more engaging. Over all students show satisfaction when they get to learn music, drama, art, computers, health, another language, career education and physical education (Li, 2016[28]). This is why students from a young age enjoy learning languages.

A study conducted by Sevillano found that the main reasons of studying a foreign language mentioned by young foreign language learners from seven different countries in Europe were that "they learn new things, the activities and that it is fun" (Sevillano, 2011[30]). Students also express their interest in learning Chinese, Latin, Greek, and Arabic, to Spanish, Japanese, Russian, Romanian, French, Italian, and German (Li, 2016[28]).

In addition to the fun aspect of learning, student also share their need of practical learning. Most students state their enjoyment into being an active learner and taking part in hands-on activities (Hopkins, 2008[31]). They prefer learning through practical investigation, working and learning from others and resolving problems (Children's Rights Alliance for England, 2008[29]). Thus, students in primary education look for group interactions, a large variety of knowledge, fun and hands-on learning.

During upper secondary education, students become career focused.

Students in upper-secondary education are career-focused. Since upper-secondary education offer multiple choices, students start identifying three types of career-focused needs in terms of college-bound knowledge, challenge focus needs and, realistic and financial needs.

Students in the EU and in the US value college-bound knowledge because they believe a college degree and employment are highly related. They are willing to take more advanced and specific classes to achieve their goals of getting a job such as higher math, more advanced classes, engineering and business (Children's Rights Alliance for England, 2008[29]). This shows that college-bound knowledge students highly focus on knowledge acquired during their education at university.

Whereas Chinese students are focused on challenge focus needs because they are concerned about future obstacles they may face. Up to now, a study done with students in Guangzhou and Hong Kong are not satisfied with their current curriculum, which they find too college-bound (Yuan, 1999[32]). They prefer to develop skills and knowledge that will help them cope with future challenges and needs, such as English literacy, social skills, knowledge on technology, use of Mandarin, persuasive ability, independent thinking ability, computer skill, strong adaptation ability, and leadership (Yuan, 1999[32]). These are also known as practical knowledge enabling them to survive in the real world.

Some other students are career-focused in terms of realistic and financial needs. A study in Tanzania shows that students choose the subject they want to learn according to the current job market. Tanzanian students linked science streams with after-school opportunities such as employment, higher education loans and further education (Kinyota, 2013[33]). Therefore, Tanzanian students are more likely to major in science. This discloses that some upper secondary students are focused on knowledge that they believe will help them stand out in the job market, some other students rely on their college degree, which they see as an entry ticket to the working world and some choose their orientation depending on knowledge that are most likely to help them face future challenges.

In post-secondary education, students turn to the job market needs.

Post-secondary students are driven by job-market needs. They put great emphasis on practical knowledge and skills, for example computer sciences and knowledge on market economics, which are considered as the most important issue to meet with the challenge in 21st century society (Yuan, 1999[32]).

Social-emotional skills are also major to them. Post-secondary students are aware that these skills provide them the flexibility and perspective to function in a changing, uncertain and agile world. Studies show that 50% of students rank social-emotional skills as their top 5 priority (Microsoft Education, 2017[34]).

Post-secondary students also highlight the importance of extracurricular activities, internships and work placement opportunities, and they want "courses to engage with employability issues" (Kandiko, C. B. & Mawer, M., 2013[35]). Students believe extracurricular activities were important for employability development: diversifying and strengthening students' CVs with experience and skills not easily garnered through degree studies. Gaining on-the-field experience has been proved to ease the access to the labour market by employers as well, especially if done in culturally diverse contexts (Crossman and Clarke, 2009[36]). This shows that practical knowledge and skills, as well as experience, are important.

Parents expect their children to earn different KSAV along their education, including disciplinary knowledge, technology skills and having good moral.

Parents' expectations differ at different levels of education. In terms of knowledge, parents want their children to develop basic Knowledge, Skills, Attitudes and Values (KSAV), such as counting, reading, shapes, taking orders from adults at primary school. At secondary school, parents emphasize more on learning academic knowledge and traditional core subjects such as math, reading, writing, and sciences. At college, they expect their children to be equipped with the appropriate KSAV to thrive in their workplace (Project Tomorrow, 2008[37]).

In terms of skills, parents expect their children to be computer literate. Approximately 67% of parents mentioned "using technology to conduct research, organize information and create oral or written reports"; followed by "summarizing research, using technology and digital content responsibly" and "ability to think critically about the relevance, authenticity, and the credibility of the resources they use" (Project Tomorrow, 2008[37]). As for US parents, digital skills are the most widely appreciated practical skills, followed by balancing a check-book or writing a resume (Public Agenda, 1998[38]).

Cognitive and social-emotional skills are important skills in parents' point of view, which includes problem solving skills, critical thinking skills and creativity. In multiple reports

from several countries, problem-solving are considered as the most important skills for students' future. However, creativity was less frequently mentioned in these reports (The Economist Intelligence Unit Limited, 2015[39]) (HSBC, 2014[40]). Parents also value collaborating and working with other people, especially with people from diverse background (ref.). This is one of the social-emotional skills that parents find most important.

Parents across all geographical scope want their children to learn attitudes and values which lie within respect for self and others, honesty, compassion, love for one another, tolerance, global awareness and perspective, cultural sensitivity (Denis Muller & Associates, 2007[41]). Parents want their children to become "decent human beings" who are tolerant and able to "relate effectively to a wide range of their fellow citizens" (Family-School & Community Partnerships Bureau, 2011[42]). This is key because it increases their sense of belonging to a community, and thus their well-being.

Parents are also aware that life satisfaction comes with a "strong sense of agency" and "a love for learning". They believe that these mind-sets can equip and empower their children in pursuing their life goals and overcoming challenges. Parents want their children to be able to take initiatives, be confident and optimistic (Family-School & Community Partnership Bureau, 2011[43]). These attitudes and values greatly affect one's well-being.

In addition to the same KSAV as parents expect for their children, teachers emphasize on physical skills, tolerance and the behaviour towards the other.

Teachers play an important role in equipping students with the right Knowledge, Skills, Attitudes and Values to succeed in the current volatile and complex world. They place disciplinary knowledge, such as reading, writing, maths and social sciences, as well as practical skills and knowledge, such as information technology knowledge and skills at the top of their priority in terms of knowledge (Planning Branch Corporate, 2015[44]).

As for skills, teachers perceive cognitive and meta-cognitive skills, social and emotional skills, and physical and practical skills as key. Regarding cognitive and meta-cognitive skills, teachers want students to develop "problem-solving (35%), and analytical thinking (32%)" as they most value these skills (HSBC, 2014[40]). Reports revealed the satisfaction of teachers in contributing to the development of abilities such as thinking and solving problems (96%) or making fair decisions (95%) (Greenberg, A. D. & Nilssen, A. H., 2014[45]) (Planning Branch Corporate, 2015[44]).

In terms of social-emotional skills, teachers put value on communication, collaboration and adaptability (Children's Rights Alliance for England, 2008[29]). The Albert Education Report showed that teachers value the ability to communicate (93%), ability to be adaptable (91%), ability to work with others towards a common goal (96%), ability to lead a group or a team (85%), ability to participate and contribute in projects and tasks (97%) (Planning Branch Corporate, 2015[44]). In order words, they believe exchanging, working and learning from others, and be flexible depending on situations are important skills to have. Nevertheless, 40% of teachers expressed that due to "the lack of time and support, as well as rigidly standardised curricula" (Microsoft Education, 2017[34]), integrating social-emotional skills to the classroom program is a challenging task.

Teachers also find physical abilities important to students. They want students to learn about the importance of staying healthy (Planning Branch Corporate, 2015[44]).

In terms of attitudes and values, teachers' expectations are very specific and lies within student's attitudes and values towards other people. They of course value basic and good moral attitudes and values, such as following rules, being punctual, being honest, respect others and taking responsibility (Planning Branch Corporate, 2015[44]). However, in addition to taking responsibility for others, they also refer to taking responsibility for students' own actions, self-control and self-discipline. Teacher find being tolerant and kind to newcomers important as well (Li, 2016[46]). This shows that they value how students treat others and think this is key part to students' development.

Employers rank digital skills, cognitive, meta-cognitive and social-emotional skills, and flexibility highly.

Employers expect students to enter the job market not only with practical skills such as computer literacy, digital skills and mathematical skills, which are vital practical skills in the technology-driven society, but also with cognitive skills and meta-cognitive skills, which includes problem solving skills, critical thinking skills and creativity, and socio-emotional skills.

Digitalization does not mean that jobs will become entirely "digital", cognitive and meta-cognitive skills will stay as equally important (Ashoka Germany and McKinsey & Company, Inc., 2018[25]).

"While we don't know what skills will be required for the human-centric jobs of the future," said Julian Alssid, vice president of workforce development, Community College of Rhode Island, "we do know that these jobs will require a highly adaptable workforce that can think critically, creatively, and work collaboratively to find solutions to rapidly developing, complex problems."

Computer literacy, digital skills and mathematical skills are important

Computer literacy is particularly important especially if employers are transforming their business models and adapting their global strategies. In the study "Global Talent 2021", digital skills are considered to be among the most important skills towards 2021 and particularly important for future employability (Oxford Economics, 2012[47]) ((n.a.), 2002[48]) ((n.a.), 2003[49]).

However, digital skills cannot be developed without mathematical skills, which makes mathematical skills even more valuable competencies. They are key to statistics, programming, critical reasoning, translating complex real world problems to data science problems, communicating mathematical concepts and results, understanding limitations of (real world) data as well as other subjects (ref. ppt math workshop).

These skills are able to contribute to great evolution, such as implementing artificial intelligence in the medical field and making healthcare more personalised and efficient. A etter focus on mathematical skills in school curriculum lead to better and more solid digital skills set, thus a faster improvement in emerging technologies (ref. ppt math workshop). Doctors interact more with continuously learning system. Healthcare is more likely to become decentralised from a physical location and accessible from data portals or the cloud. Healthcare is also more customised, preventive and continuous. Consequently, more patients feel empowered and more patients are treated.

Cognitive skills, meta-cognitive skills and social-emotional skills are also highly valued by employers

From an employable perspective, cognitive skills and meta-cognitive skills are also highly valued. Problem-solving and critical thinking are mentioned in 86% of the investigated surveys and studies across all the geographical scopes. Among those papers, 46% of them consider this construct very important, 38% consider it moderately important, whilst the rest consider it barely important.

Creativity was less frequently mentioned in these reports. It is mentioned in 66% among all investigated papers. 30% consider it highly important. 40% of them consider it moderately important and 30% consider it as less important (ref.).

Similarly, social-emotional values and skills, such as collaboration skills and respect are emphasized by employers. They are considered critical to student success in school, work, and life. However, several thousand employers pointed in a survey that 58% of graduate students lack social-emotional skills (Microsoft Education, 2017[34]).

Employers seek flexibility and agility in their employees

Employers place relatively more importance on flexibility, responsibility and integrity (all having 25% of frequency across the sample) with respect to other competencies available from the sample. Some papers highlight the importance of attitude and value attributes such as adaptability, integrity and cross-cultural sensitivity. These are deemed highly important (40%) in the corporate context for mid-level positions, as well as in European countries (Graduate Management Admission Council, 2017[50]). Indeed, adaptability, flexibility, adjustment, agility and their synonyms stand out as especially valuable characteristics towards employability.

Parents, students and faculty rank the ability to adaptive thinking skills, to convey thoughts effectively and being emotionally well as their top priority of what they see as critical for the future.

The survey shows that adaptive thinking abilities are most important in parents' point of view as they rank first among parents with 71 votes out of 271 (26%), second among students with 46 votes out of 324 (14%) and third among faculty with 82 votes out of 111 (73%). The ability to communicate orally and in writing effectively is as important to both parents (24%) and faculty (74%) as it came second place in both of their rankings. However, this same skill does not appear in students' top three priorities.

For students, they see the ability to have a global mindset as being most critical for the future. Whereas, 77% of faculty members value emotional well-being the most.

Although parents, students and faculty prioritise adaptive thinking skills, communication skills and emotional well-being differently, these skills remain critical to them for the future and thus need to be implemented in school curriculum.

Figure 29. Skills valued by parents, students and faculty

2018	Parents	Students	Faculty
Total Respondents	271	324	111
Adaptive thinking abilities to respond to changing environments and situations	71	46	82
Ability to effectively communicate orally and in writing	66	36	83
Emotional well-being	60	44	86
Ability to have a global mindset/have a world view	52	47	77
Ability to integrate conclusions and thinking across subject areas	47	23	57
Emphasis on how exponential technologies will be changing our world	44	30	42
Academic rigor in core subject areas	26	16	26
Successful high school transcripts to maximize top college entry opportunities	19	37	5

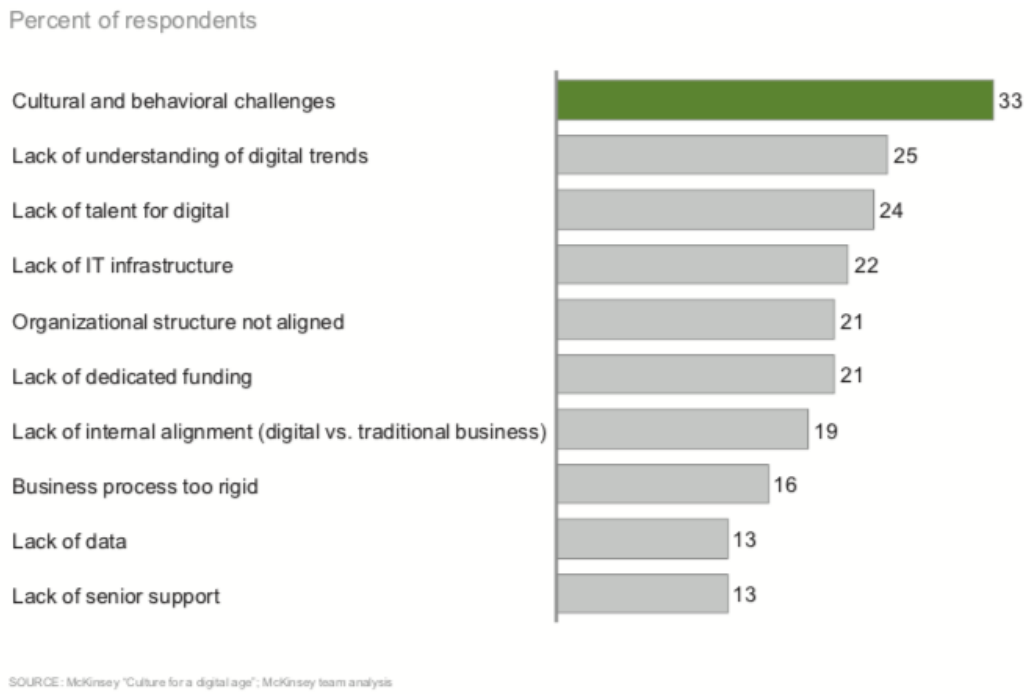
Source: 2018 Survey of La Jolla Country Day School Populations

In time of automation and digitalisation, human and meta skills are valuable for employers.

Digitalisation does not mean that jobs will become entirely "digital". Digital skills can be producing IT products and services such as programming, developing applications and managing networks. Human skills (cognitive skills such as problem solving, critical thinking and creativity) and meta skills (taking initiatives and leadership skills) will stay equally as important.

The following McKinsey survey reveals that "culture and behavioral challenges" are the most difficult to face while meeting digital priorities in an organization. It is ranked top before digital skills with 33%, then comes the lack of understanding of digital trends with 25% and the lack of IT structures with 24% (Ashoka Germany and McKinsey & Company, Inc., 2018[25]).

Figure 30. The most significant challenges to meeting digital priorities in organisations



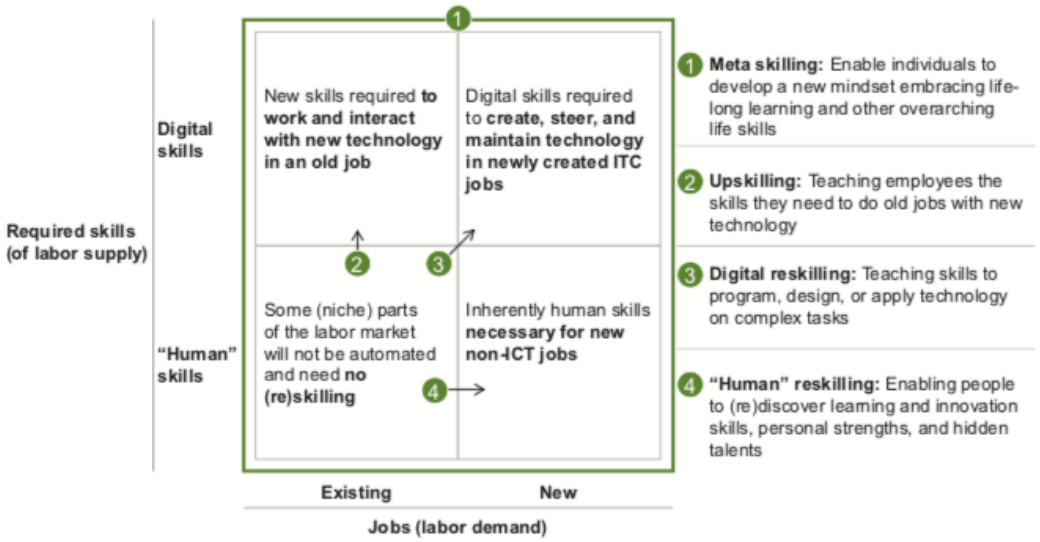
Source: (Ashoka Germany and McKinsey & Company, Inc., 2018[25])

Companies seek to empower their employees to manage themselves and want them to develop meta skills, including reskilling and upskilling.

Although the digital culture of a company is unique and defined by each of them, employers specifically value the agile way of working and the awareness of lifelong learning. In other words, companies see today the importance of teaching employees to be agile and flexible, and to learn by themselves.

Traditionally, decisions of what skills employees should develop used to come from the top management. However, with the agile way of working, organisations' structures become flatter and people will have to learn to adapt faster and better. The McKinsey survey discovers different type of skilling: meta skilling acts as an umbrella, which covers reskilling and upskilling (Ashoka Germany and McKinsey & Company, Inc., 2018[25]).

Figure 31. Different type of skilling



Source: (Ashoka Germany and McKinsey & Company, Inc., 2018[25])

Meta skills refer to "the skills needed to thrive in this new environment that has evolved beyond repetitive work and predictable career paths" (Ashoka Germany and McKinsey & Company, Inc., 2018[25]). The McKinsey report discloses that most young people do not consider these meta skills as most important. All individuals will need them in order to not only lead a satisfying personal and professional life, but also stay employable, as they show "by far the most long-term value for employability" (Ashoka Germany and McKinsey & Company, Inc., 2018[25]).

Whereas upskilling and reskilling are short-term solutions in order to follow a specific technical trend. Upskilling is acquiring additional digital skills for jobs which are replaced by machines. An example can be, checkout clerks learning how to guide customers in their usage of checkout machines and how to maintain them in case of technical issues.

In terms of reskilling, there are two types: digital reskilling and human reskilling. Digital reskilling is learning new skills for information technology jobs, such as robot manufacturing, cloud computing and data engineering. Regarding human reskilling, it is about developing skills for a job, which particularly requires human skills. Namely jobs where advising and understanding customers are needed, such as customer service and customer care (Ashoka Germany and McKinsey & Company, Inc., 2018[25]).

Social emotional skills are more and more needed in society and in the workforce. Teachers and school leaders need to help students develop stronger social-emotional skills.

Although studies show that they are considered critical to student success in school, work, and life, several thousand employers noticed that 58% of graduate students lack social-emotional skills (Microsoft Education, 2017[34]).

Figure 32. Social emotional skills of graduate students perceived by employers

Note: In a survey of several thousand employers, 58 percent said new college graduates are not adequately prepared for today's workforce, noting a particular gap in social- emotional skills.
Source: (Microsoft Education, 2017[34])

A Microsoft research emphasized the differences between how students perceive social-emotional skills delivered to them and how well-equipped teachers feel they are to teach these skills. While the study used feedback to measure these skills across four sample countries (US, UK, Canada and Singapore), results show that 30 to 40% of students perceived feedback on social emotional skills, whereas 60% of teachers reported they did.

Figure 33. Social emotional skills perceived by students and teacher

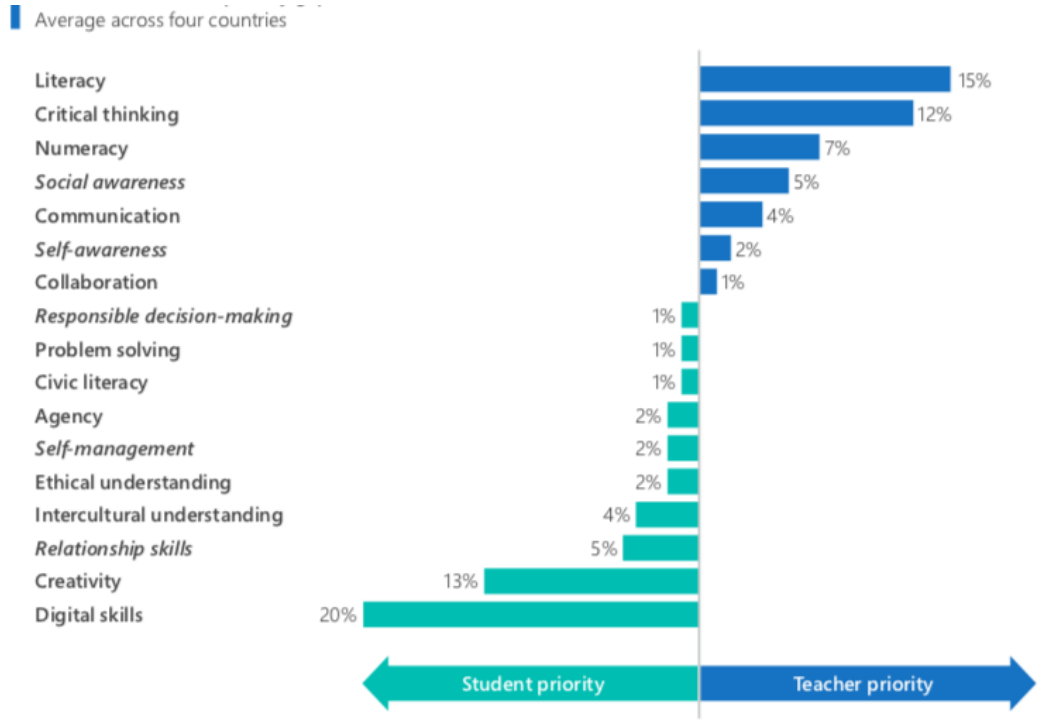
Note: These figures show the perception of reception and integration of social-emotional skills through feedback by teachers and students.
Source: (Microsoft Education, 2017[34])

The study also reveals that students value social-emotional skills more than teachers do. Half of students ranked social-emotional skills as one of their first 5 priorities, whereas 30% of teachers reported so (Microsoft Education, 2017[34]).

Teachers and students have different skills priorities. Teachers value fundamental skills whereas students want to learn more hands-on and related to employability skills.

The following graph illustrates the skill priority gap between teachers and students, based on an average across the four studied countries: US, UK, Canada and Singapore. Teachers want students to learn how to read and write, think critically, use numbers as well as mathematical approaches. However, students expect to learn digital skill, develop their creativity and relationship skill at school, which shows that teachers and students have different learning priorities (Microsoft Education, 2017[34]).

Figure 34. Teacher – student skill priority gap



Note: This chart shows the percentage point difference between teachers and students on the skills they prioritize most, based on the average priorities for each group across the four countries in the study.
Source: (Microsoft Education, 2017[34])

At school, students need to be taught core concept along with essential content because it makes students more aware and better equipped to understand the world. For this, they need to learn not only modern disciples, such as entrepreneurship and wellness, but also in a modern way, for example using an interdisciplinary approach.

Research demonstrates that for students to understand content, it should be connected to concept, so that students can make meaning out of it. Content should be modernized and it can be done in two ways, implement modern disciplines and modern ways of teaching. Modern disciplines refer to: media, people need to know how to use media in a proper and healthy way; technology and engineering, students need to have basic knowledge of coding,

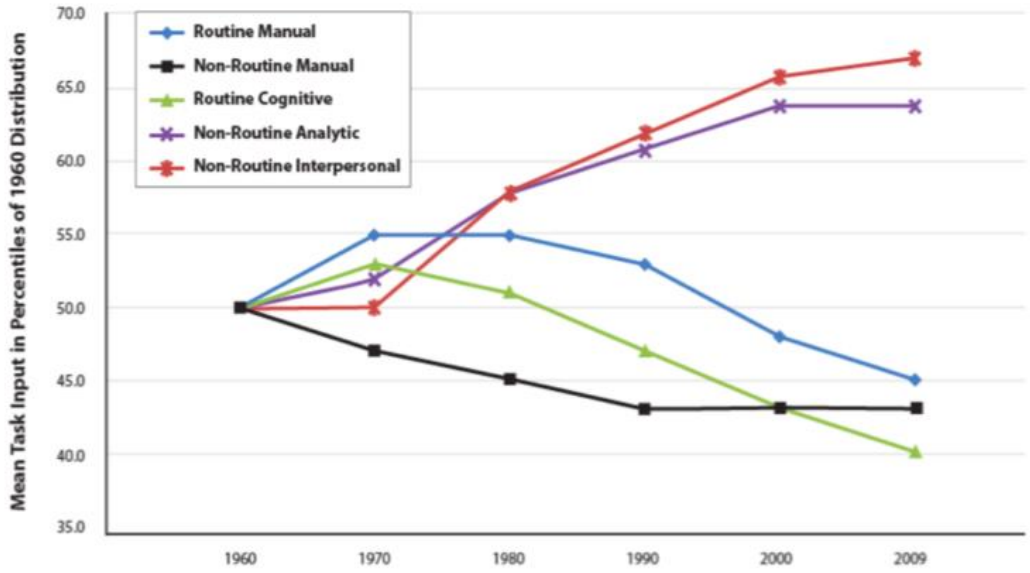
robotics and artificial intelligence; business and entrepreneurship, students need to know how to benefit from each opportunity they encounter in their life; personal finance, individuals need to know how to manage their finances; wellness, students need to know how to take care of themselves physically and mentally; and finally social sciences, students should be introduced to more social sciences courses such as psychology and political science, as it has been shown to be beneficial in professions that deal with humans (Bialik and Fadel, 2018[51]).

In order to complement modern disciplines, modern ways of approach are also needed. Since knowledge has more meaning and is more likely to be remembered when it is connected to another knowledge and disciplines, an interdisciplinary approach will be needed. Research shows that the more relationships are created across disciplines, the easier it is to strengthen concept models and content. For example, the Center of Curriculum Design gave the following example: "exponentials" (from mathematics) can be taught alongside "compound interest" (from finance) and "financial bubbles" (history, sociology), as well as "bacterial growth" (biology) and "resource exhaustion" (environmental literacy) (Bialik and Fadel, 2018[51]). This way, students get exposed to more discipline knowledge and career paths options, which will help them make better decisions.

Since more and more jobs are likely to be replaced by machines, which can only produce repeatable tasks, young people need to focus on non-routine interpersonal and non-routine analytic jobs.

The graph below shows that automation impacts on jobs differently. Routine manual jobs (i.e. factory jobs) and routine cognitive jobs (i.e. filling paper) decrease over time since these jobs are being gradually replaced by machines. Non-routine manual jobs (i.e. plumber) first decreased, then becomes constant as there is still a need for them. Whereas non-routine interpersonal (i.e. consultant) and non-routine analytics (i.e. engineer) are the types of job that keep increasing over the fifty years.

Figure 35. Changing prevalence of types of tasks required for work over time



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

The combination human-computer has been proven to be stronger than either one alone, so students need to be well-trained to use AI in order to make the most out of it.

The advancement of AI often causes confusions and debates among experts regarding the fine line between human tasks and computer tasks. In 1997, IBM created the computer Deep Blue, which beat the world chess champion Garry Kasparov. Although this example seems that humans are losing to machines, humans in fact finds opportunities to use algorithms to improve what they do best. For example, calculators do not replace mathematicians but instead lift their abilities; word processors do not replace writer but make their life easier. While it is true that changes being brought by AI are likely to be more impactful than the previous examples, if students are trained to make the best use of AI, it can also serve as a tool (Bialik and Fadel, 2018[51]).

Figure 36. Comparison of computers humans, and human-computer teams

Entity	Advantage	However…
Computer	Fast generation and testing in big search space of solutions Fast processing over big data	Solution generator is incomplete in the open world Data not a full representation of the open world
Human team	Life experience in the open world Diverse experience of cross-disciplinary teams in multiple domains	There are coordination costs
Human Computer team: (Highest performance)	Complementary kinds of cognition compensate for each other's failure modes and enhance performance	We need a better theory and practices for building human-computer teams

Source: Kefik, Mark (2017) "Half-Human, Half-Computer? Meet the Modern Centaur" PARC Blog

The Learning Compass 2030

Definitions and scope

The OECD uses the Learning compass to guide learners in their future, give them a firm foundation as well as help them to navigate the as-yet-unknown, whilst rooting them in cultural and individual identities.

The definitions and scope will be refined.

"Well-being" as the future vision towards 2030

Until now, the demands on education systems have focused on equipping students with the knowledge and skills for economic growth (often represented by macro-economic statistics such as GDP), productivity and efficiency (OECD, 2001[52]). Today, there is an increasing recognition that an economic narrative is not sufficient.

The OECD is redefining its growth narrative from "economic growth" to "inclusive growth"

In response to this, the OECD is committed to redefine the growth narrative to put "well-being" at the centre of their efforts (Gurria, 2015[53]). The OECD's Better Life Initiative: Measuring Well-Being and Progress presents 11 dimensions of individual well-being, Including housing, income, jobs, community, education, environment, civic engagement, health, life satisfaction, safety and work-life balance that contribute to societal developments, including economic capital, human capital, social capital and natural capital. These societal resources will also return to and contribute to individual well-being.

To achieve "inclusive growth", we need to recognise that humans are part of the larger eco-system

The concept of 'inclusive growth' (which highlights the issue of inequality) may need to be further developed to factor in the forms of growth that contribute to both a thriving planet and to the continued existence of bio-diversity. The latter is under threat in the course of the 'Sixth Great Extinction'. It is anticipated that the continued extinction of other species, due to human action, will markedly impact the quality of human life. The concept of 'well-being' therefore may need to be expanded to embrace a holistic view, recognising the complexity of the eco-system of which humans are a part (Kolert, 2014[54]).

Examples to illustrate the "Future We Want"

In the digital version of the publication, for each petal or indicator clicked, the following narrative will show up.

Figure 37. The OECD's Better Life Index

1. Jobs: Text narrative of a student in Hong Kong on the "Future We Want" (Box 1)

Box 1. Illustration of Future We Want - Jobs

Student from Hong Kong

The future we want is that the satisfaction of job is associated with our passion. For instance, we can pursue to be a singer without worrying that we cannot earn a living. Everyone can freely choose their dream job despite of the financial concern, in particularly the stable salaries. The future we don't want is that everyone is only aiming for the highly paid job without thinking what they really want to do or become. They blindly follow the trend and work like machines. They are not even having the motivation to work.

In Hong Kong, most graduates are aiming for jobs about finance, as it is with high rewards. However, some people might not be suited for the job or they might hate it. I plan to do advocacy, pitching the organisation doing great work to treat their employees better. However, I have seen some difficulties in the way that, usually good jobs do not attract great income by itself (e.g. humanitarian work). Yet, I wrote a letter to my school department, sharing my view on the non-paid humanitarian internship. I truly believe that good work should be promoted

2. Work Life Balance: Text narrative of a student in Hong Kong on the "Future We Want" (Box 2)

Box 2. Illustration of Future We Want – Work Life Balance

Student from Hong Kong

The future I want in Work-life balance would look like everyone could find joy and meaning in doing work more than monetary value.

Because dozens of employees are not feeling satisfied with their work, long working hours hampering relationship, lack of fulfilment and purpose. While artificial intelligence is taking off, hopefully the future workplace that we all dream, will be a more inclusive, happier, with purpose and love.

3. Safety: Text narrative of a student in Hong Kong on the "Future We Want" (Box 3)

Box 3. Illustration of Future We Want - Safety

Student from Hong Kong

The future I envision is a future where all of our women are safe on the streets, irrespective of time. What people wear is irrelevant to their human right to a safe travel home no matter the time. The world is facing a paradigm shift in issues concerning sexual harassment and mistreatment of women in the workplace with the #metoo and #timesup movements. I wish for all of my female friends and relatives to someday not have to think twice about going where they want to go, meeting who they want to meet, hanging out at whatever time they wish to, and wearing whatever makes them comfortable and happy.

4. Life satisfaction: Text narrative of a student in Portugal on the "Future We Want" (Box 4)

Box 4. Illustration of Future We Want – Life Satisfaction

Student from Portugal

My life as a student is rich in highs and lows. I didn't like school; I didn't like rules. I just wanted to walk around in the wind and do silly things. My life changed in 2014 when I decided to become a priest and began Catholic seminary school. As a part of our training, there was a rule we all had to follow - read the newspaper every day. As seminarians, we were called to love the world, and to do that, we had to grow in our understanding of the world and learn to love the people in it.

I didn't like that rule, I came from a poor family and spending money every day on a newspaper was going to cost me a lot. I decided if I had to do this I would make sure I got my money's worth and I read each newspaper from beginning to end. When I read something I did not understand, I would search through the encyclopedias in my Catholic seminary school. I didn't have the option to look it up on mobile phones or social networks, but the truth is, this process shifted my way of looking at the world and how I saw my place in it. The world became so interesting after that, I realized there was so much I didn't know, and I had so many ideas in my mind. There arose a desire in me to serve the world as best as I could. Not from a passive position, but to work in a way that was concrete, in a way that could make it better. I wanted my passage through this world to transform it into something better. So after three productive years of learning, I decided to leave seminary school and joined a project called ComParte.

ComParte is a project in Portugal that brings the voices of students and their experiences to the attention of decision makers. Through ComParte I have worked on many projects, and it has been amazing to see our work grow into an instrument of transformation within my country. Last year, together with nine other students, we collected the stories of 2,643 students from North and South Portugal and brought their voices directly to the Portuguese Government. As a result of my work for students, I was invited to attend the October 2017 OECD International Working Group in Paris France. It has been an honour and a privilege to participate in the construction of a more democratic future, and give instruments to students so they can thrive in that future with more freedom, more justice, and more truth.

5. Civic Engagement: Text narrative of a student in the Netherlands on the “Future We Want” (Box 5)

Box 5. Illustration of Future We Want – Civic Engagement

Student from the Netherlands

"I think students should be encouraged to be engaged in their community so they grow up to become active citizens who care about the people around them. A voluntary exchange will help both the local community and the student to grow as an individual. Students shouldn't learn that success is just about their academic achievements. I believe that there are more things outside academia that give students a sense of achievement and purpose.

Every Wednesday morning I volunteer with a few classmates at the local homeless shelter for 3 hours. We have learned a lot by talking to the homeless and other volunteers. This activity provides us with a balance between academic pressure and a hands-on engagement in our local community. I would like to see teenagers more engaged in their local communities. I dream of all students having the same extra-curricular opportunities provided by their schools as mine has at the moment. I hope to change this in the future. For now, I am planning on organizing a human library event for my local community.”.

6. Environment: Text narrative of a student in the Philippines and a student from Australia on the “Future We Want” (Box 6)

Box 6. Illustration of Future We Want - Environment

Student from the Philippines

"The Philippines has been blessed with such beautiful biodiversity and landscapes to the point where you can somehow call it paradise. But instead of seeing paradise in our country, most of what is left in our environment is garbage, dirty water and deforested areas. Thinking of how we wasted what was given to us and how we took them for granted really alarmed me. Specially seeing some families who drink water from dirty rivers and looking for food in garbage dumps ignited something within me to take action.

I have a concrete vision of how I want my future to look like: My vision is that people in my community and country will treasure and revive the beautiful waters, hills, landscapes that we have. That they will think of how their actions can affect others and actually give some of their time to contribute to solving environmental and health issues in their own ways. Honestly, I know that we have a long way to go in terms of realizing this dream, but I am positive that through collective efforts that encourage young people to take action, nothing is impossible.

The project that we worked on for the International Student Innovation Forum 2017 is a portable biofilter which treats greywater from the sink before it is discharged to the sewers. We did this project because in our country, most households or institutions directly discharge their wastewater without knowing that it can have harmful effects to aquatic life and to neighboring communities. People don't find it important to actually look into this issue and do something about it since they think that they have bigger problems to focus on."

Student from Australia

"Lives of happiness, contentment and connection with the world around us is the future we want to see. Leaders and systems that move us towards a future of connection with the planet and ourselves will ensure a balance of humans and life, instead of its' exploitation... we are the planet. We don't want a future of capitalist-focussed living, which will not solve the environmental crisis, and will only move us further into mind-set that disconnects us from our earth. Continuing to stick to the linear system of consumerism is the future we don't want to see.

I am an Australian living in Bali, Indonesia attending Green School. The school is set in the middle of the Balinese jungle, made from bamboo, and hosts hundreds of nature-loving families and students. The High School classes focus on solving real-world problems and integrated learning, and helps me continue my passion work for the environment.

I have begun living as a minimalist with zero-waste, and blog my experiences and advice on my own website in hopes of inspiring others to start implementing those ideals into their lives. After a year of immersing myself in this lifestyle, I decided to create a product that would make zero-waste, sustainable living more accessible for my school community - the THINK kit. I plan on extending this enterprise beyond the island of Bali in hopes of changing other western habits (especially in my hometown of Melbourne). It's all about changing myself to align with what I believe and helping others to do the same - because if everyone did that, the systems will begin to change for the better!

In the future, I plan to be a leader in the climate movement, as a policy maker, activist or change making entrepreneur. To make these changes happen, I have to start local and speak up for those who need the most help. Steps I have already taken are connecting with activists across the globe, Indigenous groups in Indonesia, and collaborating with Australian youth in the climate movement. The next step is action!"

7. Environment: Video narrative from students in Mexico and Australia on the "Future We Want" (to be presented at the IWG)

8. Education: Text narrative of a CEO and Founder of Mobile micro-learning platform, three students in Hong Kong on the "Future We Want" (Box 7)

Box 7. Illustration of Future We Want - Education

CEO and Founder of Mobile micro-learning platform

"I think for me, the future that I imagine is that everyone human being in the world is empowered to be part of their educational experience, and they are constantly learning and being empowered to take that learning and actually enrich their lives. And so I think everyone should first have access to great quality content, but also be empowered to create content. Because I believe in a world where we all have something to learn from each other. And so I guess my vision and dream would be that people feel self-worth, and feel empowered to basically contribute to other people's learning experiences, because I think that life is about life-long learning. And I guess my plan for doing that is through the work with mobile, because I think that's the device at the moment [...] that will actually have the potential to really reach billions of people around the world, whether you're in the outskirts

of Africa, or in a village in South America, to be able to provide tools in order to really empower and enrich the lives of billions of people: from older people who continuously still learn, but also down to children. So that's really my hope, and I believe that it's a future that's possible and that it's really achievable, and it will only work through collaboration with many different people. And I think we need to work with educators, with companies, with governments, with platforms and technologies, in order to make this come to reality."

Student from Hong Kong

The future I want in education is that students learn for the sake of obtaining knowledge and growing holistically, rather than for producing outstanding academic results. I hope that students will be able to enjoy learning and will not equate education with stress. Students should not be pressured into committing suicide due to the current high academic stress levels. There must be change in Hong Kong education.

Student from Hong Kong

The future I want in education would have general education that equips everyone to think critically on a wide range of social issues from home to abroad and misinformation campaigns that mislead people from seeking the truth.

Student from Hong Kong

As a secondary school student, it is my view that the education in future will be like this: students are able to know why they are studying these knowledge and how they can apply to daily life exactly. Schools will be a place for them to 'innovate without the fear of failure. I do not want a future where teachers give instructions in class instead of guiding his/her students into discussion, and where students learn just for examination and they recite answers and syllabus instead of critically thinking about the rationale behind all this.

I have been the chairman of Hong Kong Award for Young People Club this academic year. I have designed games and services for children who aged between 4-year-old to 10-year-old in April with the help of my committee members (my classmates). It is all done by us from initiating the service to game design, helpers' recruitment and conducting the service. In addition, we have invited another school to co-organize this activity so that we can share our own thoughts on creating 'original' games for the children to think and learn. Finally, we have designed some interesting games for the children. In these games, freedom are given to the children to express their own feelings and uniqueness. For example, we gave them white papers to design their own 'planes', yet, the type of plane is not limited. We will show them how to build different kinds of 'plane' but it is the children to decide what kind of plane they are going to make and how they are going to decorate them. At last, all the children will have a chance to attend a little 'flying competition', sending their own planes as far as possible. This is what we want them to start thinking about in this game: there is unlimited potential under the given condition (white papers) and a general direction (sending the plane as far as possible). It is okay to be unique and worth encouraging to express their own ideas in any format. Finally, our ideas are widely supported by club members and participants from both schools and ended up successfully."

9. Community: Text narrative of a Principal of an elementary school in Los Angeles and a student in Turkey on the "Future We Want" (Box 8)

Box 8 Illustration of Future We Want - Community

Principal of an elementary school in Los Angeles

"What is my vision for the future with regards to community? I serve a very diverse, multicultural student body that has amazing human potential. My vision is that each child is given access to equitable education, to an education that has at its core a social justice message for the community that they represent. And that each child is being given the opportunity to represent that community throughout their life and to come back and serve that community, to be empowered. It's important that we step away from a deficit-thinking approach, that we allow our children to think of the assets of cultural heritage, the assets of world languages, or local native languages, the assets of their life experiences. Many times these things are not seen as valuable, but they are extremely relevant. They're relevant because they allow students to go back and to address the knowledge-base that they came from, with the knowledge-base that they have gained through global education and global empathy.

And so my vision is that my young leaders, who are anywhere from the age of 2 to 14 years old, are being given a foundation to have self-efficacy, first of all, because if they cannot respect themselves and their unique design, it's very hard to respect others. Secondly, that they learn the skills to be kind, loving human beings – before they are scientists, before they are engineers, before they are teachers. And thirdly, that they use those skills to really navigate a future that can optimise their human potential, give them the economic freedoms, and really allow them to overcome some of the social unjust barriers that they are facing in their community at this point. That is my vision, and I'm hopeful that we can achieve it."

Student from Turkey

"The future I want in the community would look like a family living happily in a house, which means in total happiness and serenity. I mean that a community should be like a house to the group of people, in which they can feel both safe and happy. This can only happen if the people in the community know their responsibilities so that they all can achieve a better life.

Thinking of a community, greeting each other or saying good morning, good night comes to my mind first. Firstly, if mutual respect is achieved, I believe that nothing else can stop on the way of being a great, close-knit community. If happiness among the people is gained, this would have a huge positive impact on their daily lives. They would not only be nice towards each other but also they would be more productive in their jobs. Therefore, they would be productive citizens to the community.

For a better community in the future, I do not think that relationships and being aware of one's responsibilities are enough. I cannot think of a blissful community if there is an epidemic, terror or poverty. If everyone has this state of mind, which they agree on changing certain things with better ones, nothing can stop them to be a better community. In order for this to happen, I would want everyone in the community to be aware of the needs and responsibilities as humans. Creating awareness can be a good start point to climb up the stairs to a better, more developed and joyous community

10. Community: Video narrative from a student in India on the "Future We Want" (to be presented at the IWG)

Recently published analyses of PISA 2015 on students' well-being also acknowledge the fact that schools and communities are places where students develop not only academically, but where they can also grow socially and emotionally, which can help them for life (add ref.). Students, who experience a greater sense of belonging at school, are in schools with a positive disciplinary climate and report receiving parental support. They are more likely not only to perform better academically but also to report higher levels of satisfaction with life compared to other students.

Future generations are now expected to use new competencies, knowledge, skills, values and attitudes to lead a successful life and contribute to a well-functioning society. Students' motivation will no longer be content with getting a good job and a high income, they will need to be more aware of their environment and care about not only their own well-being, but also the well-being of their friends, families, communities and the planet.

Why "Learning Compass 2030"?

The OECD Learning Compass 2030 serves as a tool that enables learners to act as agents, find purpose, orient themselves towards the future they want to build and discover the meaning of their lives. The challenge in the fast-changing world is to ensure that learners have a sufficiently determined personal identity or self-concept and strong ability to convert each decision, choice, voice into responsible and meaningful actions. The idea is to act rather than being acted upon; shape rather than being shaped; and make decisions and choose rather than accepting decisions and choices made by others.

Students need to navigate oneself across unfamiliar contexts towards "Future We Want"

Today, students are expected to "travel across a wide variety of contexts" (Kegan, 2001[55]), such as traveling in time (past, present and future), in social space (family, community, region, nation, world), which also includes digital space today, in order to actively immerse themselves in different spheres of life. They also need to encounter and engage with the natural world, to appreciate its fragility, complexity and its value.

The role of education is to equip learners with a sense of agency and a sense of purpose, which includes the ability to locate and navigate themselves in a broad, complex and interrelated social and environmental context. This is why the OECD uses the metaphor of a 'Learning Compass'.

While a "compass" points its direction to the north, the OECD "Learning Compass" suggests direction towards the "Future we want". For learners, where they want to be, individually and collectively, is a starting point to how they utilise their skills and knowledge. The learning compass aims to enable learners to "locate" themselves, clarify their own vision, navigate across different contexts and shape the future for everyone to achieve individual and collective well-being. They will need to find solutions to economic, social and cultural challenges which previous generations have yet to solve or even recognise. Children, students, youth, adults, elderly will have to work together towards the same direction to conceptualise the future they desire.

The metaphor of a "compass" emphasizes the need for "navigating oneself across unfamiliar contexts" in meaningful and responsible ways, especially when facing expected, unexpected, or unprecedented opportunities and challenges due to the advent of artificial intelligence, increasing migration, growing inequality, and new threats such as cyber security, which are all interconnected.

Education we want

Education can make systematic change towards a better future as it shapes the minds of young people and, therefore, it should empower and inspire them to create a resilient, innovative and sustainable society**.** Education systems should not reproduce the social inequality nor the environmental exploitation that exists today. Systems must no longer focus only on achieving excellence and innovation, at the cost of the disengagement of the under-served and disadvantaged (Haste, 2001[56]).

Education systems should no longer consider that everything can be or should be taught in school. Education systems should not assume that teachers or textbooks can suggest all the solutions to problems students are given in classrooms; students are likely to face real-life problems that teachers or textbooks may not have answers for. Thus, education systems should offer quality learning opportunities to all students through which they learn to navigate themselves in identifying issues, creating several responses to these issues, and selecting a response that seems fit for a particular given context (Haste, 2001[56]). They also need the analytical tools to assess which solutions hold the most potential for success. This is the concept of agency.

However, current educational systems appear to be unprepared. There are many reasons for this. They include the fact that our educational systems were built for the requirements of the Industrial Revolution in the 19th Century. Then, the paradigms of our school systems were largely set and haven't changed radically ever since. However, educational systems need to change, as the challenges are severe.

A reorientation of the goals of education is necessary and urgent. While academic performance acquiring proficiency in the basic and advanced academic knowledge and skills certainly remains an education priority worldwide, studies have confirmed that in both developed and developing countries, the main focus of education is still largely on academic performance, not on the various aspects of well-being of students, and much less on future prospects and the sustainability of life in their own communities, nations and the planet. In many ways education is still 'business as usual' although the world is now steeped in unforeseen 21st century realities, making transformational change in what and how students learn a matter of considerable urgency.

We share **a sense of urgency for change**. We are committed to change our own mind-set as well as that of our peers and to action the following list. The list is still tentative, drawing on all the past IWG discussions as well as the discussions among the members of the working group on the "Future We Want". It will be furthered at the 6th IWG meeting. Systems need to **shift the paradigms of education**. Systems need too the analytical tools to assess which actions hold the most potential for successful change.

- **Educating for broader goals – well-being 2030**. This will include not only educating for jobs and skills, but also educating for "citizenship" with national and global levels, and educating for digital/ data intelligence.

- **Educating for common goods**. In some countries, too much stress is currently laid on individual autonomy, individual excellence, and development of individual skills. There is a need to reaffirm the social nature of being a person. Furthermore, education systems must no longer focus only on achieving excellence and innovation, at the cost of the disengagement of the under-served and disadvantaged.[1] Education systems should not reproduce the social inequality nor the environmental exploitation that exists today.
- **Educating for "agency"** and taking action in a responsible and meaningful manner. This will be the key underlying concept of the OECD Learning Framework, and will be detailed later.
- **Educating for a whole person**, e.g. "*Bildung* (German)", "德智体 (Chinese)", etc. This will include fostering social and emotional skills, cultivating moral values, not focusing only educating for academic achievements.
- **Educating for passion to learn across a lifetime**. This will include self-directed learning, curiosity, and motivation.
- **Educating with a growth mind-set model, not a deficit model**. Teachers should believe that their students can learn, and students should believe that they can learn. Teachers and students should have high expectations of the students, instead of focusing on their shortcomings.
- **Educating with issues in the real world.**[2] When students grow up, they are likely to face real-life problems that teachers or textbooks may not have answers for. Learners are likely to feel intrinsic motivation when they feel "authenticity" with their learning. Providing opportunities to learn from real life experiences in the real world outside school will help learners to develop skills and insights to seize new opportunities, identify key issues, creating several responses to these issues, and selecting a response that seems fit for a particular given context.[3] Education systems should no longer consider that everything can be or should be taught in school.
- **Educating through deeper learning, not more learning.** Education systems should offer quality learning opportunities to all students, avoiding curriculum and assessment overloads.

1. The term 'education systems' is intended to include not only schools but also other actors that share the responsibilities for providing students learning opportunities in a systemic and ecological way, often labelled as "learning ecosystems".
2. In the discourse exploring responses to mega global trends such as the 4th industrial revolution or the planet at risk, the following skills are often emphasised: creativity, empathy, dealing with ambiguity, engagement with uncertainty, stewardship, patience, sense-making, mind-shift, adaptation in the face of disruptive change, long-term thinking and anticipation and many others. Through the acquisition of these skills, it is argued, students will be well equipped to tackle complexity in a manageable way.
3. One of the competent human models in psychology is "puzzle solver" (Haste, 2001). The DeSeCo dismissed this model as its theoretical approach because it suggests that there is one right answer that can be arrived at by linear logical processes. In reality, however, "there are several routes to solutions, where for example, feedback loops and multiplex iteration are involved, and where there are a number of possible – and equally useful – outcomes. It is inherently intolerant of ambiguity, uncertainty, and the kind of model associated, in control-theory terms, with 'closed loop-open solution problems, or with fuzzy logic'"(Mc Neill & Freiberger, 1993, in Haste, 2001, p. 95). According to Haste, the 'problem solver' model tends to neglect ambiguity and uncertainty because it is about finding the right answer. In other words, to pursue simplicity, it tends to cut through diversity and complexity. Hence, this approach was found inadequate when it comes to deal with a messy world and fuzzy boundaries and complex issues that young people and adults will face.

- **Shifting the focus from "sage on the stage" to "guide on the side".** Education systems should not assume that teachers or textbooks can suggest all the solutions to problems students are given in classrooms;
- **Re-thinking "student success" – from student outcomes to learning processes**. Student success is often understood in the context of "students' outcomes", in particular, academic outcomes. In recent years, however, "process" is understood not as factors leading to outcomes, but as having intrinsic value in and of itself. Students' learning experiences or learning processes (e.g. whether the students are happy with their school life) are equally important as student outcomes. For example, the PISA 2015 analysis has shown that students who experience a greater sense of belonging at school, are in schools with a positive disciplinary climate and report receiving parental support are not only more likely to perform better academically but also to report higher levels of satisfaction with life compared to other students. Children and students should be able to enjoy the process. of attaining their academic objectives, but also enjoy childhood, enjoy their school life, build friendship with peers, and be happy in life.

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Student Agency and Co-Agency for 2030

Definitions and scope

Note to the reader: definitions will be revised/ refined.

The OECD uses the "Learning Compass" and puts student agency at the heart of the Learning Framework for 2030 in order to help people navigate in modern society.

Student Agency is understood as the human capability to act intentionally, to initiate and control one's behavior and interactions with others. It reflects the capacity to anticipate a future goal, to reflect, to think critically, and to question the status quo (Schoon and Lyons-Amos, 2016[57]).

The concept of "student agency/ co-agency for 2030" indicates **the competency to think, initiate and act intentionally and responsibly so as to shape the world towards individual and collective well-being in 2030**.

Student agency is both a process and a goal (desired outcome). As a process, student agency and learning have a circular reinforcing relationship. Building an individual's self-belief in their capacity to be agents of learning (and change) makes them more likely to learn, as the research on motivation shows. Co-agency refers to the idea that educational goals are shared in their developing ecosystem between young people, parents, peers and teachers. Young people can then navigate in an uncertain future, shape their own lives and contribute to the lives of others by becoming active agents.

Box. Key messages on student agency/ co-agency

- In the 21st century, individuals increasingly need to be equipped with a sense of agency to navigate through volatility, uncertainty, complexity and ambiguity
- Student Agency is relational, as it develops through interactions between an individual and their social context over life time
- Student agency develops in a non-linear process, which will shape a person over time.
- Student agency is a multi-dimensional concept, including moral, creative, economic and citizen agency.
  - Moral agency is the sense of agency that enables students to distinguish from what is right to what is wrong.
  - Creative agency gives students the understanding that they are capable of bringing their thoughts and imaginations to reality
  - Economic agency triggers moral and creativity agency to create economic value with and for other people.
  - Citizen agency refers to not only the understanding of being part of a community, having rights and responsibilities but also acting on them.
- Student agency can be observed when students feel their identity being valued, find a sense of purpose for their choice or action, and feel motivated to make the choice or take action.
- Values related to student agency vary from one culture and context to another.
  - Social norms and culture also influence one's sense of agency.
  - Historical contexts of a democratic nation may also influence the interpretation of student agency.
- Students in adversity can also develop their agency but they need sufficient and well-designed support
- With the increasing presence of AI in society, human agency is increasingly valued as human quality.
  - AI will not be equipped with its agency at least before 2030; agency is the concept intrinsic to human.
- Collaborative agency plays a particularly important role in the development of student agency due to the reciprocal nature of agency.
  - Students co-build a learning environment with their peers
  - Students co-create teaching-learning environments with their teachers, where teacher agency plays an important role
  - Students also learn from and with their parents in a family environment
  - Students also learn in a wider community contexts where they meet with peers and adults outside their school and family

- "The light is brighter when we shine together", a slogan created by the OECD Education 2030 Students' Sphere members.
- Countries are increasingly embed the concept of "student agency/ co-agency" into curriculum, but there is room for enhancement.

In the 21st century, individuals increasingly need to be equipped with a sense of agency to navigate through volatility, uncertainty, complexity and ambiguity

New interconnected changes and mega trends such as growing inequity, climate change and new threats (i.e. cyber security) spark a new challenge. It triggers a need to equip future generations with the ability to navigate in social and digital space and time and to manage their lives in meaningful and responsible ways. Student Agency enables individuals to sense opportunity, form their own goals, learn to work with other people to solve complex problems and belong to a global community. Thus, the notion of agency implies self-determination, the ability to make one's own choices, to select and create an environment for one's development.

The Future of Education and Skills 2030 project aims at equipping young people with the capabilities to navigate an uncertain future, to shape their own lives and contribute to the lives of others by becoming active agents (OECD, 2018[58]). As a result, agency is becoming increasingly important.

Note to the reader: definitions will be revised/ refined.

Student Agency is relational, as it develops through interactions between an individual and their social context over life time

Agency is not **a personality trait.** Agency has to be understood as a **dynamic and relational process that unfolds and develops over time, shaped by interactions between a developing individual and a changing social context, and thus, strongly embedded in diverse and changing social and historical contexts** (Schoon, 2017[59]). The Learning Framework views agency as a relational process that informs and shapes a person. This is a phenomenon that emerges through the unique interplay of individual capacity and the socio-cultural structures in which it is enacted – **and is thus learnable and malleable.**

Agency does not mean that individual behaviour is unfettered by external constraints, i.e. that individuals can do whatever they want. The socio-cultural context within which it is enacted also needs to be considered - as well as the ways in which individuals interact with this context. **An integrated model of learner agency has to recognise that individual decision making and action depends on interactions with others, is embedded in a wider socio-historical context (ranging from immediate social settings in one's family and neighbourhood to macro-economic conditions to digital advancements), and is shaped by variations in access to socio-economic resources**. Thus, agency requires learners to become aware of responsibilities of their own action, of social connectedness to others, and recognising the inter-dependence of their actions.

Learning and development of Student agency: Student agency is a capability that is developed through a life time. After exploring the different constructs and layers of agency, the focus turns on how students acquire and develop agency throughout their life. Agency presents itself differently according to each stage of life. Students are driven by basic

psychological needs (Deci and Ryan, 2000[60]). They look for opportunities to learn and develop their skills according to the expectations of others. At 6 months, children learn to understand intentions of people around them and are fully aware of actions of other people towards them. For example, they are able to encode and observe actions like handling toys (Woodward, 2009[61]). At the age of 18 months, children start developing a sense of self, which is an important step towards agency (Sokol et al., 2015[62]). From 2 years old, the child is able to predict consequences of actions. This is when they start managing expectations of others and seek for positive rewards after an action (Heckhausen, 1988[63]). This reveals that the development of agency during early childhood is mainly focused on meeting expectations set by the environment.

Later on, children enter primary school and adapt to a larger social context. This is the period when children explore their personal identity, the concept of self and experience the sense of achievement (Eccles, 1999[64]). Arriving in secondary school, children learn to consider other people's perspectives and understand that other people can have different opinions (Eccles, 1999[64]). According to the individual maturity of their physical, cognitive, social and emotional development, they also start experiencing the sense of responsibility, such as social responsibility and civic engagement (Sherrod, Torney-Purta and Flanagan, 2010[65]). At this stage of life, the development of agency is a relational process, which comes with time and interacting with people, starting with family, then peers and teachers (Schoon, 2017[59]). Therefore, agency takes the form of co-agency.

Note to the reader: definitions will be revised/ refined.

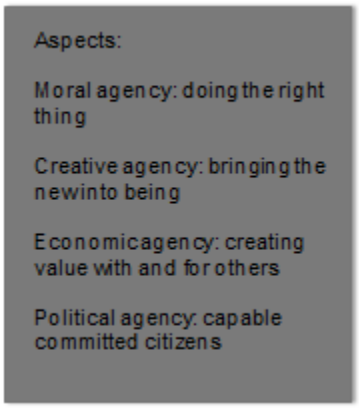
Student agency develops in a non-linear process, which will shape a person over time.

Note to the reader: this section will be elaborated based on the past IWG discussions.

Student agency is a multi-dimensional concept, including moral, creative, economic and citizen agency.

Note to the reader: this section will be elaborated based on the past IWG discussions

Figure XX. Aspect of Agency



Source: (Leadbeater, 2017[66])

It is crucial to learn how to exercise the sense of agency in the four aspects of life as they are often in tensions or conflicts and this enables students to lead a well-rounded life.

Moral agency is the sense of agency that enables students to distinguish from what is right to what is wrong.

Although students may act based on their self-interests, moral agents make decisions that are as good to one than to the other. However, the challenging aspect of moral agency is that it differs from societies. Core values of morality such as keeping promises and not turning your back to someone stay, but the evaluation of a situation whether it is good or bad depends on the individual's education of ethics, norms, values and meaning. This sense of moral agency is acquired by asking questions and thinking critically as "What should I do? Was I right to do that?" (Leadbeater, 2017[66]).

Creative agency gives students the understanding that they are capable of bringing their thoughts and imaginations to reality.

Education has the role to help students learn new things, stimulate their imagination and encourage them to bring their creation to life, which could be artistic work, practical and craft skills or a scientific experiment (Leadbeater, 2017[66]). To help students develop creative agency, educators need to guide them and show them what great craft work is, while taking them through the process of drafting, revising and refining (Yates and Hattie, 2009[67]). This enables students to learn by themselves, receive feedback and reflect on their own work.

Economic agency triggers moral and creativity agency to create economic value with and for other people.

Economic agency becomes increasingly important as many jobs are broken down into tasks which some are replaced by machines. This is already occurring in the medicine and surgery field for example, robots are used to perform laser surgery as they are more stable than human hands which tend to shake (Leadbeater, 2017[66]). The ability to create value with human qualities, such as creativity, empathy and care, is crucial for the 21st century. Education needs to prepare students to be adaptive and entrepreneurial, in order to know to what to do next (Leadbeater, 2017[66]).

Citizen agency refers to not only the understanding of being part of a community, having rights and responsibilities but also acting on them.

The development of citizen agency is fundamental individuals, the larger community and the state as it involves the history of rights and responsibilities related to its society. Going to school is a first step to acquiring citizen agency, as it introduces students to a community, with authority acted by strangers, and where students need to learn how to build relationships with other people around them (Leadbeater, 2017[66]).

Student agency can be observed when students feel their identity being valued, find a sense of purpose for their choice or action, and feel motivated to make the choice or take action.

Constructs supporting student agency have been identified throughout the project such as identity/ spiritual identity, purpose and motivation (e.g. to learn, to contribute to society). Within the OECD learning framework, identity/spiritual identity has been identified as relevant because the components of identity guide individuals' actions and believes. It makes them take responsibility for who they are. Thus, identity plays a key role in student agency and one's ability to take responsibility.

As for purpose, it has an importance to Well-Being because an individual who possesses a sense of purpose is able to flourish and thrive in society. "Student Agency," "Anticipation-Action-Reflection," and "Creating New Value" are dimensions of the Learning Framework most relevant to purpose. An individual who has a sense of purpose must be agentic, conscientious, take responsibility while considering moral and ethical implications of his/her decisions and actions, and take into account the perspectives of others.

Motivation plays a central role in the development of most (if not all) of the competencies included as part of the OECD Education 2030 learning framework. Building nearly any type of explicit competency requires effort and practice and students will only dedicate effort to a task when they are sufficiently motivated to do so. Furthermore, once a competency has been developed, it should not be assumed that students will necessarily apply it in all situations. Competencies that are challenging to apply (e.g., "reconciling with dilemmas, tensions, contradictions and trade-offs") require that students be motivated to expend a certain level of mental effort (Miele & Wigfield, 2014).

Identifying, defining and measuring constructs relevant to the development of student agency are necessary to enable educational jurisdictions around the world to find them adaptable and applicable to their local context.

Note to the reader: definitions will be revised/ refined

Box 10. Examples of traits closely related to Student Agency

- Collaboration
- Compassion
- Global mind-set
- Goal orientation
- Growth mind-set
- Identity/Spiritual identity
- Hope
- Motivation
- Pro-activeness
- Purposefulness
- Self-efficacy / Positive self-orientation
- Reflective thinking/evaluating/monitoring

Values related to student agency vary from one culture and context to another.

Social norms and culture also influence one's sense of agency.

Agency is perceived and interpreted differently in countries. For example, the concept of self-regulation in Asian culture aims to keep harmony in society, whereas in European American culture, it aims to fulfill personal goals. In terms of social norms, they differ according to the cultural and geographical context and therefore have a different effect on individual's agency across the world. Social norms refer to individual behaviours dictated by age, gender and culture.

First, individuals are usually expected to follow a timeline based on social rules which differs across cultures, i.e. when to attend school. Second, social norms are also based on stereotypes and gender beliefs, i.e. females are good at languages and males at math (Schoon, 2017[59]). Third, individuals act according to different cultural norms. In some languages there is no direct translation for the term 'agency' and it is equated with related but not identical ideas around 'student centered' or 'independent' or 'active' learning (Abiko, 2017[68]; Steinemann, 2017[69]). Moreover, apart from the difficulty of making a clear translation of the term itself, more fundamental cultural differences – centering on the relationship of the individual to the group – are critical to adaptation in different contexts. For example, the concept of self-regulation in Asian culture aims to keep harmony in society, whereas in European American culture, it aims to fulfill personal goals.

The degree to which harmony, compliance and conformity are valued above creativity and individualism are at the heart of these differences. There are implications of these considerations for 'agency', as both an education process and outcome. There may not be a universal formulation, relevant to all contexts, which captures the underpinning ideas in

'agency'. These differences in social norms across cultures and geographical context give different interpretations of the self as an agent. Thus, social norms set by culture can encourage or refrain individuals' development of agency.

Box 12: Student agency in different cultural contexts

1. "Ubuntu" in the South African tradition

This asserts that 'a person is a person through other people'.

Source: https://www.youtube.com/watch?v=0wZtfqZ271w#t=162

2. "I" in the Japanese language

Specifically, in Japan, such differences are embedded in the very language. Whilst in English 'I' is used by everyone, in Japanese different words for 'I' are appropriate in different situations contexts, like 'Watakusi', 'Boku', 'Ore', 'Shousei', or 'Jibun'. It depends on the relation between the people. In Japan then the notion of the individu- al is derived from relations within a community: the community is primary. In some Western traditions one might say communities are derived from relations among individuals who choose to associate: the individual is primary.

Source: (Abiko, 2017[68])

Note to the reader: this section will be elaborated based on the past IWG discussions.

Historical contexts of a democratic nation may also influence the interpretation of student agency.

To be inserted about different stages of a nation on democracy

Historical conditions have been found to influence the sense of agency. The socio-cultural aspect of a specific time in history differs from a country to another. The impact of historical facts on society, such as demographic change, globalisation and economic crisis, can impact on institutional settings, for example controlling access to education and employment (Schoon, 2017[59]). Therefore, these factors can influence the emerging sense of agency.

Social institutions also play an important role in shaping and guiding students according to society's expectations. They structure the life-course of individuals, set social status transitions, for example entering primary school, entering the labour market or acquiring the skills and knowledge that belong to a certain status. However, if an individual decides not to follow the structure, this predetermined system can create stress and diminish motivation, such as when people apply for tertiary education after leaving school early (Schoon, 2017[59]). Since social institutions' role is to keep students on track of social expectations, they impact negatively on the sense of student agency of those who decide to do otherwise.

Note to the reader: definitions will be revised/ refined

Students in adversity can also develop their agency but they need sufficient and well-designed support

A healthy socio-economic family background contributes to the good learning of agency at school and at home. A well development and applied of agency can thus enable individuals to overcome problems such as adversity.

Similarly, socio-economic backgrounds can have an effect on agency as they determine the availability of a family socio-economic resources. In other words, a family socio-economic situation influences the likelihood of their children accessing quality education and the individual goals they set for themselves (Schoon, 2017[59]). Differences in social structure and the extent of support that individuals receive from parents and siblings for example, can affect the development of individuals' agency. It is shown that parental education level, social status and income can influence children's sense of agency (BrooksGunn and Duncan, 1997[70]; OECD, 2017[71]; Yoshikawa, Aber and Beardslee, 2012[72]) Furthermore, children growing up in a disadvantaged socio-economic environment are found to generally exhibit lower aspirations, a lower sense of achievement and lower motivation (Duckworth and Schoon, 2012[73]), which also impacts on their self-confidence and well-being (Ahlin and Antunes, 2015[74]). Consequently, the level of socio-economic background of individuals impacts on their approach to agency.

As learner agency is acquired at school, children facing adversity are less able to develop agency (Talreja, 2017[75]). Adversity refers to frequent and intense stressful events happening to children's early life (WHO, 2018[76]). There are negative consequences of a harmed childhood (Talreja, 2017[75]), which include physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, intimate partner violence, mother treated violently, substance misuse within household, household mental illness, parental separation or divorce, and incarcerated household member (Administration, Substance Abuse and Mental Health Services, 2018[77]).

Findings reveal that children experiencing adversity during their childhood or growing up in an abused environment are less likely to develop agency. A Center for Disease Control in the United States and Kaiser Permanente, a major insurance firm, conducted a study in 1990 and found that childhood experiences of abuse, neglect, and family dysfunction led to a multitude of health and social problems such as chronic heart and lung disease, obesity, alcoholism, inability to benefit from schooling, imprisonment, depression, intimate partner violence, sexually transmitted disease, adolescent pregnancy and early death (Talreja, 2017[75]). Another study reveals that children growing up in an abused environment are nine times more likely to experience mental disorders (Read and Bentall, 2012[78]). The negative impacts of adversity stop children's learner agency from developing.

Studies show that the sense of agency can help students overcome adversity, but students who are already experiencing adversity need an environment with better conditions to enable them to develop the concept. Developing agency can be done outside of school as well as at school. **The right pedagogy and learning conditions will not only help learners overcome adversity but also help them to become an agent**. Since a child's development is filled with anxiety, surrounding adults need to bring solid support in the form of "trust, respect, care, safety, validation, creativity, authenticity, empathy and a non-judgmental approach in their relationship with the child" (Talreja, 2017[75]). Therefore, the role of adults is crucial to help children build agency.

Note to the reader: this section will be revisited, refined, elaborated based on the past IWG discussions.

Box 11. Vijaya's story

Vijaya comes from a life of extreme poverty and depravation. She was part of a life skills program through school that helped her catch up to her development milestones. Unfortunately, she was married at the early

age of 16. A child followed quickly and her marriage ended up being abusive. Two years later, having left her husband and with an infant child; she landed up at a career centre seeking support to rebuild her life. Her confidence and sense of self was shattered. She could not even talk and express her needs. Through a process of deep mentorship, over many months, the facilitators helped rebuild her sense of identity, her confidence and her skills to deal with dilemmas and challenges of life. It was not just about helping her find a job. More than that, it was about helping Vijaya believe that she can trust her choices and decisions again, that she has the resilience to rebuild her life and have positive self-orientation. Vijaya found her voice again, interned at the centre for a few months to learn skills for the job-market and explore her interests. She finally joined a vocational training program, topped it and found a job that gave her dignity, respect and a sense that she can take on life for herself and her child. Vijaya todays dreams of a very different future for her child and has the agency to make it happen.

Source: (Talreja, 2017[75])

With the increasing presence of AI in society human agency is increasingly valued as human quality.

This section will be redrafted.

Digital advancements play an important role in the level of agency because AI machines are not as adaptable as the human mind and sometimes fails to make predictions under VUCA circumstances, so individuals rely on agency to give them directions to make the world less uncertain. The human brain naturally seeks to make predictions under uncertain conditions. Since the world is becoming not only more and more uncertain, but also volatile, complex and ambiguous, humans increasingly produce machines that can help them make better and accurate predictions.

Artificial Intelligence (AI) is now able to make very accurate predictions when facing uncertainty. Although AI machines are gradually taking a large presence in society, when context changes or, facing ambiguity or volatility, machines are unable to unlearn to relearn and thus face ethical, moral and practical issues. They are good at following rules but are unable of adjusting or changing rules depending on the context, like humans can. Humans can adapt to VUCA situations. Although the human mind responds negatively to uncertainty, such as seeing it as a threat, it has great capacities to adapt and act rationally under these circumstances (Laukkonen, Biddell and Gallagher, 2018[79]).

Agency is in fact a valuable tool to help humans dealing with uncertain situations and reduce its unhealthy factors. The concept of agency gives a sense of control, which guides people's own actions and decisions in the uncertain world. Belief systems, sets of goals and values act as a compass showing the agent a wanted direction and a structure to follow. This thus contributes to making the world seem less threatening. Agency is increasingly important especially in the time of AI because it is a concept that is irreplaceable by machines (Laukkonen, Biddell and Gallagher, 2018[79]). Humans have the unique ability to address uncertainty and act upon beliefs, goals and values.

Another ability specific to humans, and also to the concept of agency, is the ability "to learn to learn". It teaches humans to constantly be questioning, learning, adjusting to the world, and seeing each change as an opportunity instead of a threat. For example, in the time of digitalization, individuals might lose their job due to automation and need to make a career switch. Without the ability to learn to learn, they are very likely to see the change as negative and threatening. If individuals are introduced and prepared to "learn to learn" from primary and secondary educations (Laukkonen, Biddell and Gallagher, 2018[79]), such

situations of change will seem less intimidating. This shows that digital advancements influence the speed and level of agency implementation, the more advanced technology becomes the faster and higher level of agency is needed.

Agency by AI raises questions.

With the increasing presence of AI in people's daily life, the capability of AI raises questions about the possibility of it becoming an autonomous agent. Research show that challenges for AI to become autonomous agents are practical and ethical issues (Laukkonen, Biddell and Gallagher, 2018[79]).

Collaborative agency plays a particularly important role in the development of student agency due to the reciprocal nature of agency.

Note to the reader: the following in this section will be revisited, refined, elaborated based on the past IWG discussions.

The OECD 2030 Learning Framework places the critical importance on the concept of "co-agency" to highlight the multi-dimensional nature of "agency". Educational goals are shared among everyone concerned in the ecosystem, not limited to relationship between students and teachers and their peers, but also with parents and the community around them.

It is also important to recognize that the exercise of agency is reciprocal (Salmela-Aro, 2009[80]). Not only that teachers, peers, parents and the community influence learners' agency, but also vice versa that learners influence teachers', peers' and parents' agency.

Students co-build a learning environment with their peers

Co-agency also happens at a students-peers level. Having students leading the dynamic of the classroom creates an environment that is more likely to encourage them to participate, ask questions, have open and candid discussions, and express opposing opinions and make challenging statements (Salmela-Aro, 2017[81]). They not only gain a higher level of analysis and communication skills but are also more creative while solving problems (Greig, 2000; Hogan, Nastasi, & Pressley, 2000). Students reach a better sense of autonomy and are more confident working in teams (Gafney & Varma-Nelson, 2007). This results to a better student achievement, attitudes, and persistence, in addition to improved higher sense of empowerment, analytical thinking and problem-solving ability.

Students co-create teaching-learning environments with their teachers, where teacher agency plays an important role

In the traditional teaching model, teachers were expected to deliver knowledge through instruction and evaluation. Agentic learning involves not only learning from instruction and evaluation but also co-construction, where students are given new roles, where they engage with learning, ask questions and where different opinions are discussed (Soini, Pietarinen and Pyhältö, 2016[82]). **Thus, the relationship between teachers and students encourages the development of agency and co-creation of learning experiences.**

With co-agency, **teachers and students become co-creators in the teaching-learning process, students experience a sense of purpose in education and take ownership of their learning** (see box). For teachers to be effective co-agents it is important that they develop "the capacity to act purposefully and constructively to direct their professional

growth and contribute to the growth of their students and colleagues" (Calvert, 2016[83]). In order to achieve this, teachers need support from the system-level, such as policy frameworks, statements, and regulations.

Students also learn from and with their parents in a family environment

Considering students as co-creators in the learning process brings an interesting pivot in the way parents are viewed in relationship with the teachers and the school. Ongoing research shows that family engagement in schools improves student achievement, reduces absenteeism, and restores parents' confidence in their children's education (Davis-Keen, 2005[84]). Students with involved parents or other caregivers earn higher grades and test scores, have better social skills, and show improved behaviour. In many poor households, there is a cumulative disadvantage, including low levels of education, low paid and often precarious employment, uncertainty, often having to balance multiple jobs, as one job does not pay enough to support a family. But in some situations it is best for schools not to reinforce what is happening at home, but to provide a counterpoint, compensation for lack of resources or cognitive stimulation.

Teachers and parents both need help in making the interplay effective. That can be challenging in high poverty communities, where parents often lack the knowledge, English language skills, or confidence to help their children with their schoolwork (Davis-Keen, 2005[84]).

Creating learning environments where students feel in charge of their learning and have opportunities to share with their parents allows for them to not only deepen their understanding but also work on demonstrating co-agency where they influence their parents' knowledge & skill levels.

Students also learn in a wider community contexts where they meet with peers and adults outside their school and family

Given that the future that children are going to face is going to be constantly changing and characterized by instability, it is important to consider how not to rest the responsibility of readiness solely on the shoulders of only young learners. While they on their own are brimming with potential to be able to influence, impact and shape the future; it is the responsibility of adults to come together to enable them with competencies to be able to do so. It would be futile to try and achieve this sustainably and inclusively without the key stakeholders in their lives - peers, teachers, their parents and the larger community. To learn from the Maori culture of Aotearoa New Zealand - a people and a community that continues to prioritize togetherness and the collective over individual achievements or pursuits, hoea ngātahitia ki kō atu--paddling together takes us further together.

"The light is brighter when we shine together", a slogan created by the OECD Education 2030 Students' Sphere members.

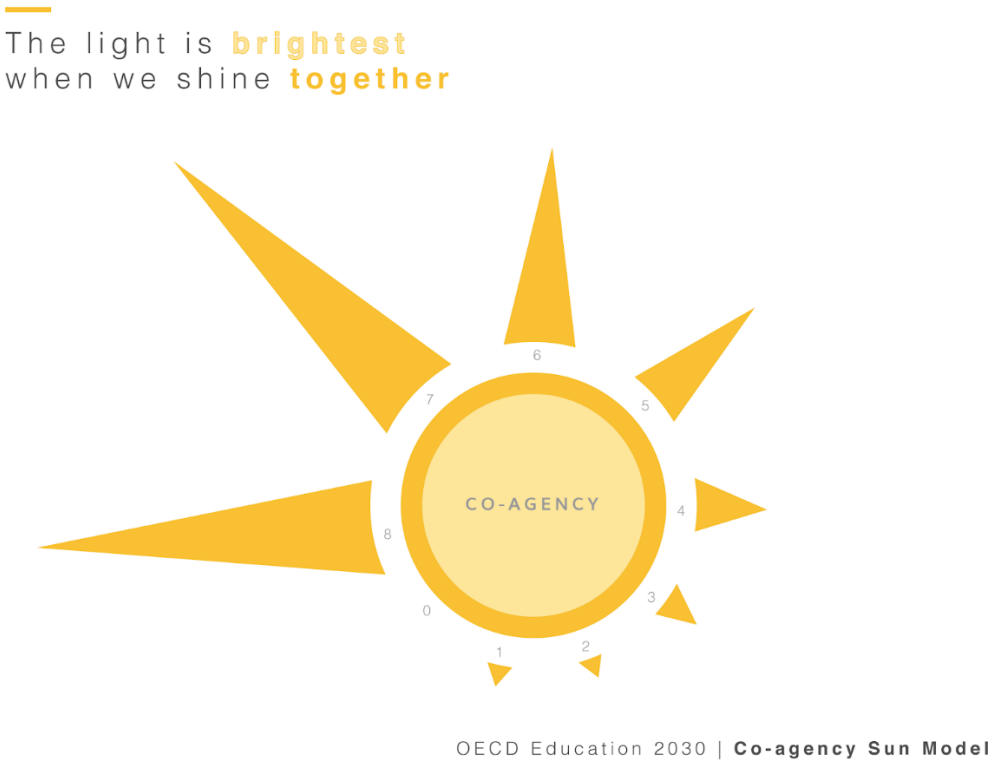
Note to the reader: this section will be revisited, refined, elaborated based on the past IWG discussions.

Not only teachers, but also parents, peers and the larger community are not always aware of the importance of being a co-agent. Their role in a child's life and their role in the development of a child's transformative competencies should be well understood. They need to take time and space to connect with themselves and learn about the concept that they are responsible for to pass on. Adults who possess co-agency are people who put a

child's development as their top priority (see box). These adults are more creative, authentic, non-judgmental, empathetic, better listeners are more likely to bring joy in a child's life. They pass on their feelings and values to children, which make them feel supported and help them to better create transformative experiences in the areas of: creating new value, taking responsibility and reconciling tensions and dilemma's (Talreja, 2017[75]). The sense of agency is difficult for children to develop on their own, thus they often need the collaboration of adults to "co-regulate" their actions and development.

To reflect and highlight the concept of co-agency, the visualisation of the OECD Learning Framework was refined by adding peers, teachers, parents and communities.

Figure 38. The Sun Model of co-agency



Degrees of co-agency:
0. Silence: Neither young people nor adults believe that young people can contribute and young people remain silent while adults take and lead all initiatives as well as make all decisions.
1. Manipulation: Adults use young people to support causes, pretending the causes are invited by young people.
2. Decoration: Adults use young people to help or bolster a cause.
3. Tokenism: Adults appear to give young people a choice, but there is little or no choice about the substance and way of participation.
4. Assigned but informed: Young people are assigned a specific role and informed about how and why they are involved, but do not take part in leading or taking decisions for the project or their place in it.
5. Adult lead with student input: Young people are consulted on the projects designed, and informed about outcome, while adults lead it and make the decisions.
6. Shared decision making, adult lead: Young people are a part of the decision making of a project lead and initiated by adults.
7. Young people-initiated and directed: Young people initiate and direct a project with support of adults. Adults are consulted and may guide/advise in decision making, but all decisions are ultimately taken by young people.
8. Young people-initiated, shared decisions with adults: Young people initiate a project and the decision making is shared between young people and adults. Leading and running the project is an equal partnership between young people and adults.

Note: The Sun Model of Co-agency will be discussed and refined at the 8th IWG meeting
Source: Hart R, 1997 Children's Participation: The Theory And Practice Of Involving Young Citizens In Community Development And Environmental Care UNICEF. Modified from the ladder of student participation by the OECD Student Sphere

Countries are increasingly embed the concept of "student agency/ co-agency" into curriculum, but there is room for enhancement.

Since it is the role of education to support students in their development of student agency, countries are updating traditional curriculum in recent years. Since students are expected to act as agents, they need to graduate, with not only the abilities to read and write, to add and subtract, and to use computers but also be responsible adults and take actions for their own future (Leadbeater, 2017[66]). If it is the role of educators to support students in learning and developing agency throughout their life, then education can no longer follow a traditional curriculum set-up. Education needs to engage students in activities and experiences, foster risk taking, encourage teamwork and serve the community. Schools is a safe place where students acquire a sense of agency, autonomy and responsibility, learn when to wait for guidance, when to take actions and how to turn ideas into reality. They also need to be given opportunities, a safe space to fail as part of learning from the experience, choices and flexibilities while keeping the risk of "unguided choice" in mind. This is the learning dynamics that schools need to create where learning happens while doing. In other words, students show they have learned only if they are able to reproduce or apply the acquired skills and knowledge in an appropriate situation.

Some examples of countries which have embedded student agency models in their curriculum are (Leadbeater, 2017[66]):

- Singapore seeks to develop confident people, self-directed learners and active contributors with a strong emphasis on values of respect, responsibility, integrity, care and harmony.
- Alberta, Canada, aims for engaged thinkers and ethical citizens with an entrepreneurial spirit while British Columbia, Canada has a curriculum organised around simple principles of understand, know and do.
- Australia's core curriculum aims to develop successful learners who are confident and creative individuals and active citizens.

Note to the reader: More examples will be added from the analysis on the policy questionnaire and the curriculum content mapping of the E2030 project.

Traditional curriculum reward diligence and the ability to follow rules, but young people also need to to experiment on their own, receive feedback, and distinguish when to take initiative and when to seek for guidance. The OECD 2030 Learning Framework supports everyone, teachers, school leaders, parents, policymakers, private sector, foundations, or anyone in the community, to support young learner to develop themselves through dynamic and responsible learning when acquiring agency.

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